

scattered places behind. Tegulæ large, pure white; the wings whitish hyaline, well tinged with tawny fuscous on basal half or third.

This may prove to be conspecific with *purpurascens*, but it will at least form a good variety of that species.

Neither of the above species belongs to any of Wulp's Mexican *Hyalomyias*.

[To be continued.]

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V.—*The Species and Subspecies of Zebras.* By R. I. Pocock, of the British Museum of Natural History.

PART I.—*Introductory Remarks.*

FOR some years past, during periodical visits to the museum at Bristol, my attention has been attracted by a stuffed specimen of a zebra-like animal, which, in addition to being labelled "Quagga," possessed special interest, inasmuch as it differed strikingly in the character of its markings from all the zebras in the collection of the British Museum and from all that I had seen in menageries and elsewhere. The true Quagga, as is now admitted on all hands, is extinct, and only a few specimens have been preserved in the various museums of Europe. Consequently the example in question, if correctly named, would be of great zoological interest and of very considerable value as a museum possession. I therefore undertook, with the consent of Mr. Edward Wilson, F.G.S., the curator, who kindly gave me every facility in the way of examining and sketching the specimen, to identify it, if possible, and ascertain as nearly as might be its affinities with regard to the known forms of zebras. As is explained later on, the specimen, though of considerable interest, proved to have no proper claim to the title of quagga. But the task of identification entailed the looking up of a deal of the literature published on the subject by both naturalists and sportsmen and an examination of all the skins and living specimens to which access could be obtained; and since during the investigation a few structural points came to light which have apparently escaped notice until now, and since, with the exception of Dr. Paul Matschie's paper alluded to below, no paper dealing comprehensively with all the species has been published of late years, I have ventured to hope that the notes and observations contained in the following pages, though



necessarily sketchy and far from exhausting even the systematic aspect of the question, may prove of some use to those who are interested in becoming acquainted with the different species and subspecies that have been established.

It must be understood, however, that the statements that have been made have been derived, owing to the scarcity of material, from the examination of a relatively small number of skins, and that extended observations may prove hereafter that some of the conclusions are unjustifiable. For example, in the appended synopsis of species it is asserted that the presence of a longitudinal ventral stripe is distinctive of the zebras as compared with the asses, the assertion resting on its presence in all the zebras and its absence in the asses of the species *hemionus*, *tæniopus*, and *somaliensis* \* that I have been able to see. Personally I venture to doubt whether it is ever absent in the zebras, though it must not be forgotten that Gray described the belly of Burchell's zebra as being without stripes, that Sir William Flower states that in the common zebra the belly often has a longitudinal stripe ('The Horse,' p. 86), and that, according to Noack (Zool. Garten, xxxiv. p. 293), the belly of the quagga frequently has a middle band, the qualifying adverb of time in each sentence clearly suggesting the occasional absence of the stripe in the species mentioned.

Concerning the specific characters of the mountain zebra and Grévy's zebra nothing by way of introduction need here be said; but touching Burchell's zebra and its subdivisions a few words of explanation may not be out of place.

There seems to be a widespread misconception on the part of sportsmen in South Africa as to the identity of the genuine Burchell's zebra, for, with the exception of the two well-marked species mentioned above, the name "Burchell's" is applied indiscriminately to all the zebras that range over East and South Africa from Masailand to the Orange and Vaal Rivers. For example, Dr. Donaldson Smith ('Through Unknown African Countries,' p. 255, 1897) speaks of the occurrence of Burchell's zebra near Lake Stephanie; yet it is tolerably certain that no zebra resembling the typical Burchell's occurs to the north of the Zambesi, and even to the south of this river the name is loosely assigned to animals distinguishable at a glance from the principal form. Why the characters of the principal form should have been so completely forgotten is hard to understand, unless, indeed, it be partly due to the circumstance that for many years past a

\* Noack, Zool. Garten, April 1884, p. 101 (= *somalicus*, Selater, P. Z. S. Nov. 1884, p. 540).



zebra from Zululand has been exhibited in the British Museum, and labelled, though quite erroneously, "Burchell's zebra, typical variety." As a matter of fact, a glance at the original figure will show that the specimen in question is very different from the type as figured and described by Gray ; or, perhaps—and this seems the more likely explanation—the wide application that is given to the name is attributable to the existence of intermediate forms, which renders an accurate recognition of the different kinds of Burchell's zebra a task of no little difficulty. That a great number of these "kinds" exist is beyond dispute. Moreover, just as the right and left sides of a zebra are seldom, if, indeed, ever, marked in the same way, so, too, are no two members of a herd exactly alike. And yet at the same time an examination of skins from different parts of the vast area, with its varied climate and geographical features, over which the so-called Burchell's zebra roams, forces home the conviction on the mind of the observer that the extreme variations in coloration that occur are not, so to speak, fortuitous sports, but that they are distinctly correlated with geographical distribution. For example, the available evidence shows that the weakly striped type of zebra from Zululand, as exemplified by the specimen in the British Museum, does not occur in Mashunaland \*, where a strongly striped type prevails ; nor does the Mashunaland zebra seem to be met with in Zululand. The types, in fact, are perfectly distinct when considered apart from other forms. It is true, however, that the animal which always passes in this country as Chapman's zebra presents characters nearly, if not quite, intermediate in their nature between those distinctive of the local races mentioned above, and that Wahlberg's zebra from Zululand similarly constitutes a kind of link between Chapman's and the typical Burchell's. In other words, these forms are not recognizable as distinct species, as Dr. Paul Matschie holds, but must rather take the rank of *subspecies*, the use of this word implying on the part of the describer a belief, firstly, that the forms named are geographical races or incipient species, and, secondly, that intermediate types exist.

The actual naming of such subspecies is, of course, open to the objection that it is not possible to assign a definite name to an absolutely annectant form. But against the opposite course—the course that is usually adopted because it entails no serious trouble—namely, that of neglecting subspecific

\* Mr. J. H. J. Darling informs me that the zebra characteristic of Mashunaland is the form here named *Selousii*, and that he has never met with *Wahlbergi* in the country.



groups and stating in a general kind of way that Burchell's zebra is an exceedingly variable species, the far more important objection may be alleged that it leads to an ignoring of the variations as of no significance and to a total disregard of the highly important but as yet unintelligible fact that in a particular locality a particular form prevails. It is the interpretation of this fact, the recollection of which is greatly assisted by the judicious use of nomenclature, that with the cooperation of the sportsman or collector should be the ultimate object of the systematist.

In the present paper seven such subspecies or local races of Burchell's zebra have been recognized, two of them being forms that have not previously been named. It must be understood, however, that scarcity of properly localized material renders some of the conclusions with regard to these forms more or less tentative, and that skins of zebras of different ages from all localities, wherewith to test the constancy of markings, are indispensable for the satisfactory settlement of the questions; and now that the need for practical evidence of this nature is known, it is hoped that sportsmen will endeavour to obtain it before the advance of civilization has either exterminated these beautiful animals or placed them under the artificial conditions of preservation—a contingency that is certain to follow if we may judge from the fate that has befallen two formerly abundant South-African species, namely the quagga and the so-called common or mountain zebra.

## PART II.—*Descriptions of the Species.*

### (1) *Equus zebra*, Linn.

*Equus zebra*, Linnæus, Syst. Nat. ed. x. p. 74 (1758).

*Equus montanus*, Burchell, Travels &c. i. p. 139 (1822).

This species was originally based upon figures and descriptions apparently representing three distinct species. Two of these are from Edwards's 'Gleanings of Natural History,' v. pls. ccxxii. and ccxxiii., the first of which is the form which now bears the name, the second being the quagga, while the others, though very inaccurate, appear to have been taken from examples of one of the subspecies of *Burchelli* (see Aldrovandi, Quadrup. i. p. 417, pl. viii., and Johnston, Quadrup. pl. v. fig. 1). The specific name *zebra*, however, has been definitely assigned to the species depicted on pl. ccxxii. of Edwards's work, the said figure being drawn from an example (the type) then preserved in the museum of the College of Physicians, London.



Most of the distinctive characters of this species are well known.

The head, neck, body, and legs are closely covered with broad black stripes, which are considerably broader than the pale interspaces. Except for the longitudinal ventral band, the belly is white, the flank-stripes stopping short of the belly as in the quagga, Burchell's zebra, and Grévy's zebra. The spinal stripe is scarcely noticeable on the back, but broadens on the rump and is continued on to the tail, which has a black tip but is without distinct lateral markings. The legs are strongly striped to the hoof, the lower part of the pastern being quite black, and on the inner side are ornamented from above the knees and hocks. On the rump the space between the spinal stripe and the stripe that runs to the root of the tail is entirely covered with transverse bars, forming a continuous series with the upper ends of the flank-stripes, and becoming shorter and shorter towards the root of the tail. This constitutes the so-called "gridiron pattern" characteristic of this species. A similar pattern, however, though on a smaller scale, is not unfrequently noticeable in subspecies of *E. Burchelli*; but in the latter the aforesaid transverse bars do not reach the stripe that runs to the base of the tail, but the uppermost of the rump-stripes that passes backwards from the flanks and lies adjacent to the spinal stripe. The quarters are banded with arched longitudinal stripes, but only the lower or front ends of the two uppermost of these extend on to the belly. On the face in front of the eyes and on the forehead the stripes are tan-coloured and pass into the large nostril-patches of the same tint, the muzzle itself being black.

The ears are long and asinine, the feet narrow and fitted for rocky country; and, lastly, there is one curious structural feature in which this species differs not only from the other zebras but from all the species of *Equidæ*—this is the reversal in direction of the hair along the spine between the rump and withers.

Though formerly abundant in the mountainous districts of Cape Colony, this species is now verging on extinction. Happily, however, the artificial preservation of herds has postponed, at all events for a time, this inevitable result of the encroachment of civilization.

## (2) *Equus quagga*, Gmelin.

*Equus quagga*, Gmelin's edition of Linné's Syst. Nat. i., Mammalia, p. 213 (1788).

? *Equus isabellinus*, H. Smith, Naturalist's Library, Horses, p. 332 pl. xxv. (1841).



For the type of this species may be selected the specimen, belonging to the then Prince of Wales, which was figured and described as the female of the mountain zebra by Edwards in his 'Gleanings of Natural History,' v. pl. ccxxiii. The other references cited by Gmelin are to a description given by Pennant in his 'History,' p. 14. no. 3, to the mention of the species by Masson (Phil. Trans. (Acta Angl.) lxvi. p. 297), and to a figure published by Buffon (Hist. Nat. xii. p. 1, pl. ii.) which unmistakably represents an example of *E. zebra*, Linn.

Edwards's figure and description make perfectly clear the essential characters of the type of this now extinct species. The ground-colour of the body and head were a pale chestnut, the belly, legs, and tail, including the tuft, being white. The muzzle was darker than the face, being of a brownish hue, but not so black as in Burchell's zebra; the head, neck, and fore part of the body, however, were strongly marked with black stripes, apparently exactly as in that species. Moreover, on the hinder part of the flanks and upper part of the quarters the stripes dorsally take a backward bend assuming an obliquely longitudinal direction, but, instead of being continuous, they were broken up into a series of blotches or large spots; and a row of similar spots was observable on each side of the spinal stripe between the withers and rump, these spots representing the upper ends of the flank-stripes. The spinal stripe was continued on to the tail, and there was a median ventral stripe, the rest of the belly, like the whole of the lower part of the quarters and legs, being free from stripes.

The specimen figured and described by H. Smith as *E. isabellinus* is said by Gray to be the young of *E. quagga*. Unfortunately the type, once in the British Museum, appears to be no longer in existence. It differed from all known zebras, and resembled the asses, in having the muzzle white and the mane unstriped.

The example identified as the quagga contained in the collection of the British Museum differs strikingly from the specimen figured by Edwards in the indistinctness and indefiniteness of the stripes not only on the body, but also on the head and neck. Instead of the well-defined black stripes noticeable in the original figure, all the stripes are reddish brown, and on the head are only distinct on the area that lies between the eyes and ears, on the cheek, and on the nose to a point halfway between the eye and the nostril. The neck is marked with irregular broad brown double stripes separated by narrow yellowish-white interspaces; the withers are



striped, but the shoulder is practically unstriped. Along the sides of the spinal stripe dark brown patches representing the dorsal extremities of the flank-stripes are traceable as far as the rump; but the posterior part of the flanks is very indistinctly banded, presenting a mottled appearance. It is evident, however, that towards the quarters the stripes were arranged in an obliquely longitudinal direction. It may be added that the specimen under notice is certainly faded; but, taking these facts into consideration, there is no doubt that it was originally very different from the example seen by Edwards.

The figure of this species published by Gray in the 'Knowsley Menagerie,' from which those given by Noack (Zool. Garten, xxxiv. p. 290) have been adapted, show the backward extension of the stripes as far as the quarters and their breaking up into spots, as in the type; whereas in the coloured drawing of the species in Harris's 'Game Animals of South Africa,' as well as in Hamilton Smith's volume on the horse, the dark stripes, though black and well defined over the head and neck, scarcely extend past the withers. According to Matschie, too (Zool. Garten, xxxv. p. 38), the ground-colour, possibly from exposure to light, varies from dark brown to a much paler tint.

It is sometimes stated that the tail of the quagga is more thickly hairy than in the other zebras, and approaches that of domestic horses. No evidence of this fact, however, is supplied by Edwards's figure nor by the specimen in the British Museum, nor by the specimen of which there is a photogravure in Sir William Flower's book on the horse (see p. 90). It is noticeable, however, that in the Museum example the hair on the fetlocks is longer than in any zebra that I have seen.

This species was formerly abundant on the flats of Cape Colony to the south of the Orange River.

### (3) *Equus Burchelli* (Gray).

*Asinus Burchellii*, J. E. Gray, Zool. Journ. i. p. 247, pl. iv. (1825).

*Equus zebroides*, Lesson, Manuel de Mammalogie, p. 346 (1827).

*Equus festivus*, Wagner, in Schreber's Säugethiere, vi. p. 216, pl. ccxvii. B. (1834).

*Hippotigris campestris*, H. Smith, Jardine's Naturalist's Library, Horses, p. 329 (1841).

The above synonymy needs no justification, seeing that the three names *zebroides*, *festivus*, and *campestris* were proposed by their authors to replace the older name *Burchelli*, apparently for no better reason than the imaginary inappropriateness of the latter title.



This species was apparently first met with, by the traveller whose name it bears, across the Vaal River in British Bechuanaland. The exact locality of the type specimen seems to have been unrecorded, Gray contenting himself with the statement that the species occurs on the flats near the Cape. Burchell, however, tells us that he fell in with this species at several localities—to wit, Klaarwater, Kuruman, Littaku, &c. Matschie, indeed (Zool. Garten, xxxv. p. 66, 1894), believes that it extends eastwards as far as Zululand, basing his opinion apparently upon the assertion by Buckley that Burchell's zebra is common in that country. It seems evident, however, that Buckley was speaking, not of the typical *Burchelli*, nor of the form recognized by Matschie as *Burchelli*, in which there are no stripes on the legs, fore or hind, and only the merest traces of them on the flanks, but of either the form termed *Chapmanni* or that named *Wahlbergi*, in which, as explained below, the stripes reach below the hocks or even to the hoofs.

According to Gray, the body of the type was white and marked with alternate broad stripes of black and narrow ones of brown, the latter nearly filling up the intervals between the former. Moreover, the "shadow-stripes," as stated in the description and clearly shown in the figure, were visible not only on the shoulder but right up the neck almost as far as the head. In other words, it may be briefly said that every broad black stripe on the neck and body was accompanied by its corresponding shadow-stripe; and, lastly, none of the body-stripes pass beneath the belly, and only the upper part of the flank is ornamented with them, the lower part of this region, the belly, legs, and tail being quite white, and, according to Gray, without stripes, though probably this assertion must not be considered to include the median belly-stripe and the spinal stripe, which in all other known zebras spreads on to the root of the tail.

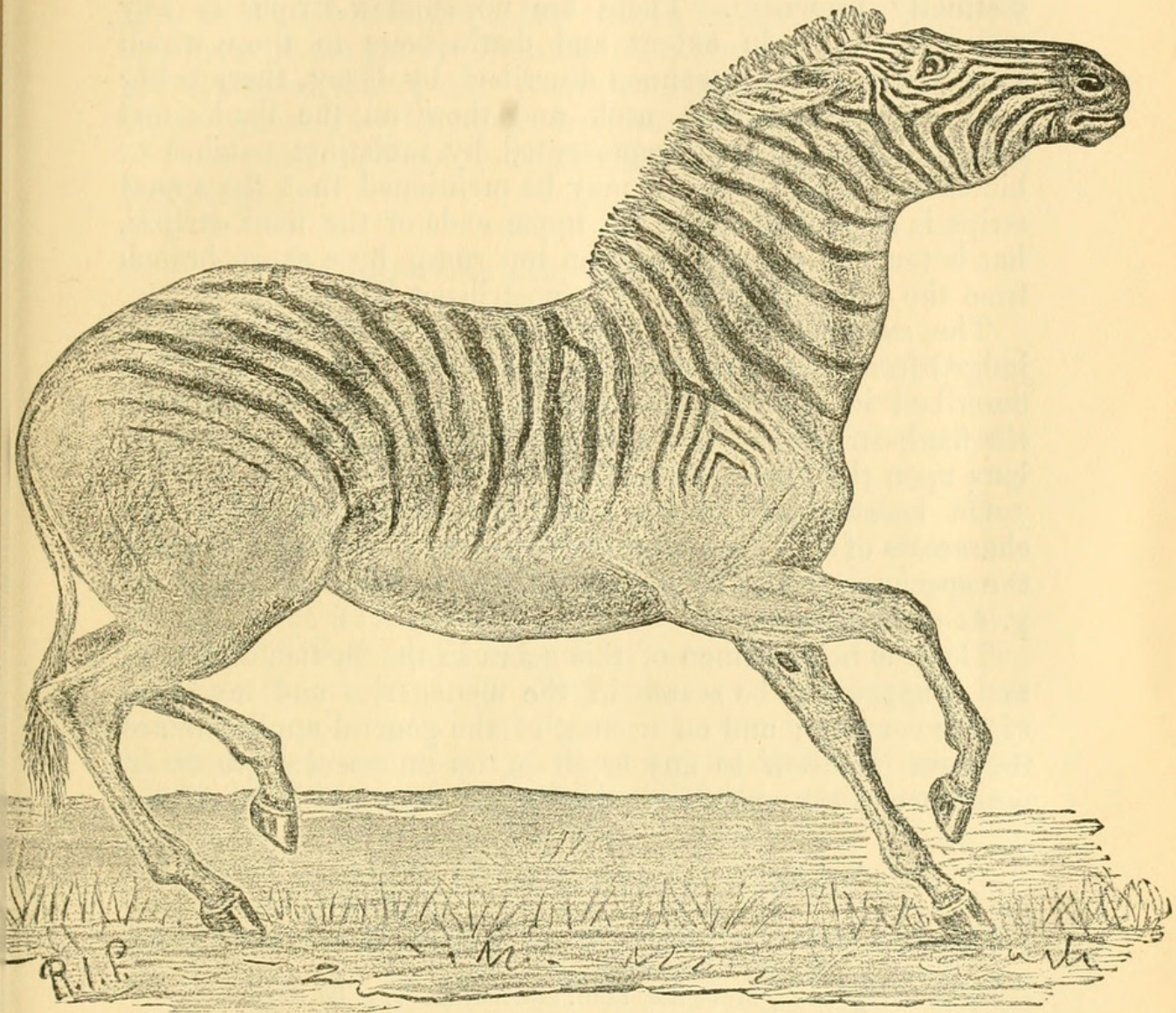
The form figured and described by Matschie (Zool. Garten, xxxv. p. 66, 1894) as Burchell's zebra, though showing the same distribution of stripes as in Gray's type, appears to differ from it in the entire absence of shadow-stripes. None, at least, are mentioned in the description and none appear on the figure taken from a living specimen, from an unstated locality, in the Zoological Gardens at Berlin.

But though differing from the type, this specimen seems to resemble the left-hand figure of the plate depicting Burchell's zebras published by Gray in the 'Knowsley Menagerie,' the drawing on the right representing an animal closely approaching the typical form, and distinguishable from



the other by its paler colour and the presence of shadow-stripes\*.

It is the specimen represented in the left-hand figure that the two examples that I have seen mostly resemble. One of these is in the Rothschild Museum at Tring and the other in the City Museum at Bristol. These examples, however, are not exactly alike, and for neither, unfortunately, is there, I believe, any exact locality known.



In the Bristol specimen the head and neck are whitish and normally marked with brownish-black stripes. The upper part of the body and the quarters, on the contrary, are clothed with dark ruddy greyish-brown hair, the dark stripes

\* Mr. J. folliott Darling tells me that there is a specimen of this subspecies in the Dublin Museum. It has the shadow-stripes extending halfway along the neck as in the type; but there are faint bars upon the hocks and *two* of the flank-stripes pass beneath the belly to join the ventral stripe.



being less distinctly defined than on the neck and more or less losing themselves in the brownish colour of the intervening spaces. The lower half of the quarters and of the shoulder, as well as the belly, are whitish, the pale tint of the latter region being rather sharply defined from the dusky tint of the flanks. The belly-stripe is distinct, but the legs are without stripes, though the knees and shins of the fore legs and the pasterns and fetlocks of fore and hind legs are distinctly brownish. There are no shadow-stripes in any way comparable in extent and distinctness to those which were visible in the specimen described by Gray, there being none visible upon the neck and those on the flanks and quarters being merely represented by indistinct patches or blotches. And, lastly, it may be mentioned that the spinal stripe is separated from the upper ends of the flank-stripes, but is touched on each side on the rump by a short branch from the adjacent stripe. The nostril-patches are black.

The example in the Tring Museum, so far as could be judged from a cursory examination, differs from the one just described in two respects—namely, the upward extension of the flank-stripes to touch the spinal stripe and the presence of bars upon the knees and hocks.

On account of the prevalent misconception as to the characters of the true Burchell's zebra, a sketch taken from the specimen in the Bristol Museum has been published on p. 41 of this paper.

There is no specimen of this zebra in the British Museum, and it appears to be scarce in the menageries and museums of this country; and on account of the general application of the term *Burchelli* to any or all of its subspecies, we are in ignorance of the exact area that it now occupies in S. Africa.

#### Subspecies *antiquorum* (H. Smith).

*Hippotigris antiquorum*, H. Smith, in Jardine's Naturalist's Library, Horses, p. 327, pl. xxii. (1841).

*Equus antiquorum*, Matschie, Zool. Garten, xxxv. p. 68, fig. (1894).

According to the figures published by Hamilton Smith and Matschie, and to the description given by the latter author, the zebra that received the name *antiquorum*, on the supposition that it was specifically identical with the one seen in the early days of African travel in the Congo region by Pigafetta, differs from Burchell's zebra in having the stripes extending over the quarters almost down to the hock and from the shoulder to the knee, while those on the flanks, instead of stopping short where the white of the belly begins,



pass on to the lower surface of the belly, though without coming into contact with the ventral stripe. Shadow-stripes are visible over the quarters and flanks almost up to the withers, the tail is laterally banded, and the nostril-patches are reddish brown.

Hamilton Smith calls this form the Congo Dauw, though there is no evidence that the example he figured and described came from that region. Matschie, on the other hand, speaks of it as the Damaraland zebra on the evidence afforded by a specimen in the Berlin Museum from the southern border of the Kalahari desert and from a reference to a zebra with white legs said by Chapman to inhabit Damaraland.

I have had no opportunity of examining a specimen of this subspecies.

### Subspecies *Chapmanni*, Layard.

*Equus Chapmanni*, Layard, Proc. Zool. Soc. 1865, p. 417.

When Layard established this species he was apparently alike unsuspecting of its near relationship to *E. Burchelli* and unaware of the existence of *E. antiquorum*, since the emphatic terms in which he speaks of its distinctness apply to it only as compared with the mountain zebra (*E. zebra*). From this point of view *E. Chapmanni* is, of course, a well-marked form, but from *antiquorum* it seems to differ only in characters of subspecific importance. There is, however, unfortunately no type specimen and no figure, so far as I am aware, of any of the original examples from which the description was drawn up. But provisionally, at all events, the name may be attached to the form figured by Dr. Sclater as *Chapmanni* (P. Z. S. 1865, pl. xxii.), a drawing of apparently the same subspecies being published in Sir William Flower's book on the Horse, p. 87. From the account given by Layard it may be gathered that *Chapmanni* may be recognized from *antiquorum* at all events in the union of the lower ends of the body-stripes with the ventral stripe. The legs, too, are marked, though sometimes only faintly, to the hoof. Baines, indeed (*l. c.* p. 419), comparing *Chapmanni* with what he calls Burchell's zebra, though probably not referring to the typical *Burchelli*, mentions the extension of the leg-stripes to the hoof in Chapman's zebra as compared with the stopping short of these marks at the hocks and knees in Burchell's species as the chief distinguishing feature between the two. Nevertheless it is questionable what value is to be attached to this character in comparing *Chapmanni* with *antiquorum*, since H. Smith, in his diagnosis of the latter, states that the



legs are at times marked to the fetlocks. It is clear, however, that the author may have confounded the two subspecies. One other feature mentioned by Chapman may be noticed—namely, that on the thighs the stripes are alternately pale brown and dark brown (*l. c.* p. 418).

I have seen no zebra skin that exactly fits this description, but at the present time there are several specimens living in the Zoological Gardens in London that precisely coincide with it. The legs are marked to the hoof, though not strongly striped thereto; shadow-stripes are visible on the quarters, and the muzzle-patches are almost black.

Lastly, these zebras seem to be identical in all particulars with the one living in the Zoological Gardens in Berlin which Matschie has figured (*Zool. Garten*, xxxv. p. 70, 1894) to illustrate the distinctive features of the species he has named *Böhmi*. See also fig. 52, p. 95, 'Die Säugethiere Ost-Afrikas,' Berlin, 1895.

Chapman fell in with the zebra which bears his name in the country lying between Damaraland and Matabeleland, the animal, according to Layard, being first met with 200 miles inland of Walvisch Bay, that is to say, in Damaraland, where it doubtless encroaches upon the territory of *E. antiquorum* and probably blends with it.

#### Subspecies *Wahlbergi*, nov.

This subspecies is based upon a stuffed specimen obtained in Zululand by Wahlberg, and now exhibited in the Mammalian Gallery of the Natural History Museum (B.M. no. 46.6.2.76).

The stripes are a deep chocolate-brown in colour; those on the flanks are wider than the intervening spaces, but on the quarters the principal stripes are narrow, being only a little wider than the shadow-stripes, which are very distinct on this region and are traceable up to the withers. It is also noticeable that the first principal stripe below the one that runs to the root of the tail is almost as pale as the shadow-stripes. On the lower half of the quarters and shoulder the stripes begin to die away, becoming gradually thinner and more widely spaced, but are stronger on the knees and hocks than immediately above and below these joints. They extend to a point about halfway between the hocks or knees and fetlocks, the fetlocks, pasterns, and inner side of the legs being without markings. The lower ends of the flank-stripes meet the ventral stripe. The tail is laterally spotted, its tuft being almost entirely white, with only a few black hairs at



the tip. The nostril-patches dull tan-coloured (possibly faded).

In the character of its markings this zebra resembles in a general way the West-African *E. antiquorum*, but appears to differ at least in the fusion of the flank-stripes with the ventral stripe. Moreover, judging by the figure that Matschie has published, the body-stripes in *antiquorum* are narrower than the intervening spaces, not broader as in *Wahlbergi*, and the principal stripes across the quarters are much broader and stronger as compared with the shadow-stripes than in the Zululand form.

Unfortunately too little is known about *Chapmanni* to make a close comparison between it and *Wahlbergi* possible. It is stated, however, that the legs were marked to the hoof, and there is every reason for concluding that in a fairly strongly striped form, such as *Chapmanni* seems to be, the stripes upon the quarters exhibit no such indications of dying away as are observable in *Wahlbergi*.

In the Rothschild Museum at Tring there is also an example of this subspecies from Zululand. It differs from the type in the breaking up of the stripes on the lower half of the quarters and shoulder into an irregularly reticulated pattern.

#### Subspecies *Selousii*, nov.

This subspecies is based upon a specimen shot by Mr. F. C. Selous on the Manyami River in Mashunaland, and now exhibited in the Mammalian Gallery of the Natural History Museum (B.M. no. 83.7.28.9).

The body and neck are covered with broad brownish-black stripes, which are considerably wider than the intervening yellowish-white spaces, and the principal stripes on the quarters form broad black bands more than half the width of the pale spaces. These spaces are marked by narrow and faint shadow-stripes, much thinner than the principal stripes; faint traces of similar shadow-stripes are just discernible on the flanks. The tail is strongly banded, the stripes meeting the caudal continuation of the spinal stripe; the tuft is black, with only a few long white hairs at its base. On the legs the stripes show no signs of diminution either in thickness or intensity, being black and nearly as broad as the intervening white bands, while over the fetlocks and pasterns they become more or less fused together, the lower part of the pastern being quite black. The inner side of the pasterns and fetlocks of all the limbs are as strongly striped as the outer side; the knees and hocks are also banded on the inner side, and on the



hind leg there are stripes on the inner side of the cannon-bone; but for the rest the inner surfaces of the legs are unstriped, though the ends of the stripes of the outer side extend round the front and back of the limbs. The nostril-patches are coffee-brown.

This form seems to be an exaggeration of the type known as *Chapmanni*, but appears to be separable from it by strength of the leg-markings and the much blacker fetlocks and pasterns. From *Wahlbergi* it is strikingly different, not only in the striping of the legs but also in that of the body and quarters, the principal stripes being noticeably wider as compared with the pale interspaces and the shadow-stripes very much fainter.

A second specimen of this subspecies that I have seen was also obtained in Mashunaland by Mr. Selous, and forms part of the collection of the Hon. Walter Rothschild at Tring. It substantially agrees with the type, but has the shadow-stripes more conspicuous on the flanks.

#### Subspecies *Crawshayi*, de Winton.

*Equus Burchelli Crawshayi*, de Winton, Ann. & Mag. Nat. Hist. (6) xvii. p. 319 (1896).

Of this subspecies, which inhabits the highlands of British Central Africa to the west and south of Lake Nyasa, the British Museum possesses three skins—one (the type) from Henga (*Crawshay*), a second from British Central Africa (*A. Sharpe*), and the third (a foal) from Mount Zomba, also obtained by the last-named collector.

In general appearance *Crawshayi* most nearly approaches the Mashunaland form *Selousii*, but is quite distinct from the latter, as from all the other subspecies of *Burchelli*, as *Crawshay* (Proc. Zool. Soc. 1895, p. 689) originally supposed. In the first place, there is no trace of shadow-stripes even on the quarters, where the stripes, black, as in other parts of the body, are as broad or even broader than the intervening spaces. The tail is not decidedly striped laterally, but strongly spotted, with the tuft black. The legs are, if anything, even more strongly striped than in *Selousii*, the pasterns being black above the hoof and the inner surface barred from the knees and hocks downwards. And, lastly, the nostril-patches are bright tan in colour. It may be added, moreover, that there is a strong tendency in this form for the upper quarter stripes to break up into a network of bars which presents a superficial resemblance to the so-called gridiron pattern of the mountain zebra. Similar variations, however, are not infrequent in zebras of the *Chapmanni* type.



The foal from Zomba, mentioned above, is interesting, inasmuch as it differs from the typical form in having the nostril-patches black and six complete bands and one short one between the shoulder-stripe and the first flank-stripe that dorsally takes a backward bend on to the summit of the quarters, there being but four of these stripes in the type, four or five being the number in the various forms of *Burchelli*, as already pointed out by Prof. Ewart ('The Veterinarian,' Nov. 1896, p. 11, author's copy).

Subspecies *Grantii*, De Winton.

*Equus Burchelli Grantii*, de Winton, Ann. & Mag. Nat. Hist. (6) xvii. p. 319 (1896).

In the collection of the British Museum there are three more or less imperfect skins of this subspecies, which may be comprehensively spoken of as the Masailand zebra. One of these was shot by Mr. J. Thomson at Uganda (see Proc. Zool. Soc. 1890, p. 413, fig.); the others were obtained by Dr. Gregory, one at Lake Baringo and the other on the Theca Theca River, upper Tana River (type).

It resembles the Nyasaland form *Crawshayi* in the entire absence of shadow-stripes, but may be readily distinguished by the deep chocolate-brown colour of the stripes, which are even wider than in *Crawshay's* zebra, those on the quarters being very noticeably broader than the intervening spaces, and by the black nostril-patches. The tail, too, is more decidedly striped at the sides, the tuft being black. The skin of the lower half of the legs is unfortunately cut away, but these appendages were probably striped to the hoof.

On geographical grounds it might be supposed that this subspecies would prove identical with *Equus Böhmi*, based upon a skin alleged to have been brought from Kilima Njaro and described by Matschie (SB. Ges. nat. Fr. Berlin, 1892, p. 131) as being distinguished by its whitish-yellow colour, broader stripes, legs banded though not strongly to the hoof, and shadow-stripes visible only on the quarters, the absence of any reddish-brown nostril-patches being subsequently added as a differential character (Zool. Garten, xxxv. p. 70). As has been observed, however (*suprà*, p. 44), there is nothing in this diagnosis that serves to distinguish *Böhmi* from specimens, said to be South-African, now living at the Zoological Gardens in London, and ascribed, not without justification, to *E. Chapmanni*, Layard. At all events the presence of the shadow-stripes stamps *Böhmi* as belonging to the type of Burchell's zebra that is characteristic of the area to the south of the Zambesi, and differentiates it at



once from both of the East-African forms established by Mr. de Winton.

(4) *Equus Grevyi*, Oustalet.

*Equus Grevyi*, Oustalet, 'La Nature,' x. p. 12, 1882.

This species, the most northerly of the zebras inhabiting Abyssinia and Somaliland, is strikingly different from the rest of the group (see figures in Proc. Zool. Soc. 1882, p. 721, and 1890, p. 413). The flanks and quarters are covered with a great number of narrow deep brown stripes separated by still narrower interspaces. The belly is free from transverse stripes as in the mountain zebra (*E. zebra*); but upon the quarters there are no broad obliquely longitudinal stripes, such as are seen in the last-named species and the various forms of *E. Burchelli*, the bands upon the upper half of this area being vertical (transverse), resembling both in size and direction those of the flanks; on the lower half of the quarters they assume a longitudinal direction, and are continued thence on to the hind legs, which, like the fore pair, are closely striped to the hoof inside and outside. Again, the spinal stripe, narrow behind the withers, is very broad over the saddle and rump, but broader on the saddle, where it fuses with the flank-stripes, than on the rump, where it is separated by a very wide space on each side from the upper ends of the quarter-stripes. The tail is not striped at the sides, but spotted, and its tuft is composed of black and white hairs. Connected with the markings on the head there are two peculiarities:—Firstly, the muzzle is not black, as in the other species (? the quagga), but greyish, and not many shades darker than the pale ground-colour of the rest of the head; and, secondly, the stripes continued from the forehead on to the nose usually fail to meet the muzzle-patches, being at most connected with them by very fine lines. Lastly, the nostril-patches are not black, as stated by Matschie (Zool. Garten, xxxv. p. 71), but tan-coloured.

So far as structural features are concerned, in addition to the greater length of the face and ears as compared with the other zebras, this species is quite peculiar for the minute size of those bare patches of skin above the knee on the fore legs, which in England are spoken of as warts or chestnuts.

The British Museum has skins and heads of this species from Berbera and from Durhi, Ogardain, 3000 feet alt., in Somaliland (*Capt. Swayne*), as well as a mounted specimen shot by Col. Paget in this same country.

The subjoined table gives a summary of the chief characters



and conclusions mentioned in the foregoing pages. The species have been arranged in accordance with my views as to their affinities. In my opinion Grévy's zebra stands apart from all the rest, the common mountain zebra having less affinity with it than with those of the *Burchelli* type, although helping in part to bridge over the interval between the two. There seems, however, to be but little evidence to show to which of the fully-striped subspecies of Burchell's the common zebra is most related, though for choice one would suggest one of those that occur to the north of the Zambesi—perhaps *Crawshayi*—in which there are no shadow-stripes. It is interesting to note in connexion with the subspecies of Burchell's zebra that from north to south there is a gradual lessening of the stripes both in intensity and extension, the gradation from *Crawshayi* to *Selousii* and thence through *Chapmanni* and *Wahlbergi* or *antiquorum* to *Burchelli* being very striking, the culminating point being reached by the quagga, which resembles the true *Burchelli* in many points both of colour and structure.

- a. Head, neck, and body, with the exception of the spinal and sometimes the shoulder-stripe, unstriped; no longitudinal belly-stripe; muzzle white, without patches above the nostrils, contrasting sharply with the darker tint of the head ..... ASSES. (Central Asia to Somaliland.)
- b. Head, neck, and, at all events, the fore part of the body distinctly striped; a longitudinal belly-stripe present; muzzle usually black, at all events not lighter than the ground-colour of the face, with a conspicuous blotch of dark-coloured hair above the nostrils .... ZEBRAS. (Abyssinia and Somaliland to Cape Colony.)
- a<sup>1</sup>. Warts on the fore legs very small; stripes on body and quarters narrow; none of those on the flanks bent backwards dorsally to extend on to the quarters, the upper half of which is covered with vertical stripes arranged concentrically and almost semi-circularly around the root of the tail; spinal stripe very broad, broadest on the middle of the back; muzzle of a greyish tint; stripes on the nose practically stopping short of the nostril-patches ..... *Grévyi*. (Abyssinia and Somaliland.)
- b<sup>1</sup>. Warts on fore legs large; stripes broader; quarters marked with obliquely longitudinal stripes, the upper of which arise from the posterior end of the body, where the upper extremities of the stripes are bent



backwards towards the root of the tail; no concentric arrangement of stripes round the root of the tail; muzzle dark, usually black; the stripes on the nose continuous with the nostril-patches. . . . . (Masailand to Cape Colony.)

- $a^2$ . Hairs along the spine between the rump and the withers reversed in direction of growth; ears longer, hoofs narrower, tail-tuft more scanty; all the body-stripes, with the exception of two which pass on to the rump and quarters, running up to meet the spinal stripe and cutting it at right angles; the area which lies over the rump between the spinal stripe and the uppermost haunch-stripe which runs to the root of the tail not longitudinally striped, but covered with the so-called gridiron pattern of transverse bars. *zebra*, Linn. (Mountainous parts of Cape Colony.)

- $b^2$ . Hairs on spine not reversed in direction; ears shorter, hoofs broader, tail-tuft fuller; the upper ends of some five or six of the stripes in the posterior half of the body bent backwards in a direction parallel to the spinal stripe; the area between the stripe then runs to the root of the tail, and the spinal stripe on the rump not covered with transverse bars, but crossed longitudinally by the backwardly extending upper extremity of at least one of the body-stripes (not true of quagga in every particular) . . . . . (Plains and tablelands of East and South Africa.)

- $a^3$ . Ground-colour of neck, body, and quarters mostly pale ochre-yellow, sometimes almost white, not chestnut; the stripes, which extend back as far as the rump and quarters, complete, and showing but slight indications of breaking up into spots . . . . . (Burchell's *zebra sensu latissimo*.)

- $a^4$ . Quarters marked with strong complete stripes below the long stripe that runs to the root of the tail; legs striped at least as far as the hocks and knees; body-stripes extending on to the belly and (except in *antiquorum*) touching the belly-stripe; tail spotted or striped laterally

- $a^5$ . No trace of shadow-stripes between the principal stripes either on the body or quarters; principal stripes on the quarters broader, or at



least as broad, as the intervening  
light spaces ..... (E. Africa, north of  
the Zambesi.)

*a*<sup>6</sup>. Stripes brown, broad; nostril-  
patches black ..... *Grantii*, de Winton.  
(Masailand.)

*b*<sup>6</sup>. Stripes blacker, narrower;  
nostril-patches yellowish brown  
(tan) ..... *Crawshayi*, de Winton.  
(Nyasaland.)

*b*<sup>5</sup>. Shadow-stripes traceable between  
the principal stripes at least on  
the quarters; principal stripes on  
the quarters as a rule narrower  
than the intervening spaces .... (South of the Zam-  
besi.)

*a*<sup>7</sup>. Body-stripes passing beneath the  
belly and meeting the ventral  
stripe.

*a*<sup>8</sup>. Shadow-stripes on quarters  
faint and narrow, much nar-  
rower than the principal  
stripes; legs mottled or  
striped to hoof.

*a*<sup>9</sup>. Outer side of legs strongly  
striped to hoof; fetlocks  
and pasterns completely  
striped both externally and  
internally; lower half of  
pastern black from the fu-  
sion of stripes, as in *Craw-*  
*shayi* ..... *Selousii*, nov. (Ma-  
shunaland.)

*b*<sup>9</sup>. Stripes on lower half of legs  
showing a distinct ten-  
dency to become obliterated  
and break up into irregular  
brown spots; lower part  
of pastern not continuously  
black ..... *Chapmanni*, Layard\*.  
(Between Damara-  
land and Matabele-  
land.)

*b*<sup>8</sup>. Shadow-stripes on quarters  
strong and distinct, not very  
much narrower than the  
principal stripes, which are  
themselves very narrow, far  
narrower than the interven-  
ing spaces that contain the  
shadow-stripes (fetlocks and  
pasterns without stripes or  
spots) ..... *Wahlbergi*, nov.  
(Zululand.)

\* Including also *Böhmi*, Matschie, judging from figures and descrip-  
tions.



- b*<sup>7</sup>. Lower ends of body-stripes on belly not meeting ventral stripe; principal stripes on quarters broad; legs not or hardly striped below knees and hocks . . . . . *antiquorum*, H. Smith. (Damaraland.)
- b*<sup>4</sup> Quarters with only a few abbreviated stripes below the long stripe that runs to the root of the tail; body-stripes stopping short above the belly as in *E. zebra*, *E. quagga*, and *E. Grevyi*; legs without stripes, except sometimes on the knees and hocks; tail usually without lateral spots or stripes . . . . . *Burchelli*, Gray (*sensu stricto*). (British Bechuanaland.)
- b*<sup>3</sup>. Ground-colour yellowish red or chestnut, with the exception of the belly and legs, which are pale and without stripes as in *E. Burchelli*; body-stripes showing a strong tendency to die away on the posterior part of the flanks, when reaching the quarters broken up into spots . . . . . *quagga*, Gmelin. (Cape Colony, south of Orange River.)

VI.—*Aquatic Rhynchota: Descriptions and Notes*.—No. I.  
By GEORGE W. KIRKALDY.

Fam. *Corixidæ*.

DIAPREPOCORIS, gen. nov.

*Corixinarum* genus, scutello magno parapleurisque minutis instructis; ovalis, depressus; capite magno, basi supra thoracem producto. Pronoto transversissimo, non rastrato. Scutello hemielytris non rastratis. Rostro unisegmentato. Palis bisegmentatis. Pedibus intermediis posticisque *Corixæ*, Geoff., similibus.

Oval, depressed, dull; *head* large (very convex at the vertex), overlapping the very transverse non-rastrate pronotum. *Scutellum* very large, not rastrate; *parapleura* minute. *Hemielytra* not rastrate.

*Rostrum* unisegmentate. *Palæ* bisegmentate.

Intermediate and posterior *pedes* as in *Corixa*, Geoff.

This utterly distinct genus is readily distinguished by the very transverse pronotum and by the large scutellum; the parapleura and the unisegmentate rostrum will further sepa-





Pocock, R. I. 1897. "V.—The species and subspecies of Zebras." *The Annals and magazine of natural history; zoology, botany, and geology* 20, 33–52.

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