Contributions to the study of some African Mammals.—II. The subspecies of the Black Rhinoceros, *Diceros bicornis* (Linnaeus), defined by the proportions of the skull. By A. TINDELL HOPWOOD, D.Sc., F.L.S., Department of Geology, British Museum (Natural History).

(Plates 10 & 11)

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I. INTRODUCTION.

Recent examples of the Black Rhinoceros vary slightly according to the district in which they live, and certain ill-defined subspecies such as *Diceros bicornis holmwoodi* (Sclater) and *D. b. somaliensis* (Potocki) have been distinguished. No detailed account of these two forms has yet been published, although Lydekker (1911) pointed out differences between two skulls, one from East Africa and one from Somaliland.

One reason for the uncertainty which exists is the difficulty of assembling enough material, but the scarcity of specimens of the true *D. b. bicornis* (Linnaeus) is an even more cogent reason. This form is but meagrely represented in the British Museum, and none of the specimens is from the typical locality. Of the three skulls in the collection, two are from Mashonaland ; the other, obtained 180 miles N.E. of Lattakoo, is the holotype of *Rhinoceros keitloa* A. Smith, 1836. In another great museum, the United States National Museum, there is not a single specimen (Hollister, 1924).

In view of the discovery of this species in the Pleistocene of East Africa, it seemed desirable to frame more precise definitions of the Recent subspecies. The skull was chosen for this purpose because it is easier to work with than the rest of the skeleton, and because there are many more skulls than skeletons in the British Museum collections. The only fossil specimens yet discovered are a few isolated teeth, but from the occurrence of skulls of the White Rhinoceros (*Ceratotherium simum*), which was the common species in Lower and Middle Pleistocene times, one feels certain that skulls of the Black Rhinoceros, too, must have been preserved.

Lydekker (1916) listed four subspecies, namely, *D. bicornis bicornis* (Linnaeus), *D. b. holmwoodi* (Sclater), *D. b. somaliensis* (Potocki), and *D. b. cucullatus* (Wagner). Putting the last on one side because it is probably an artifact (cf. Schwarz, 1920), the ranges of the other three may be fixed as follow :

D. b. bicornis, from the Cape of Good Hope to the Zambesi River.

D. b. holmwoodi, from North of the Zambesi River to the Northern Uaso Nyiro.

D. b. somaliensis, Abyssinia and Somaliland, including Jubaland.

In addition to these three forms, there are in the Museum two skulls from West Africa ; one is from Angola, and the other is from Northern Nigeria. These have been included, and are discussed below.

TABLE I.

(The Roman figures are measurements in mm. Italic figures are proportions.)

Subspecies.	Locality and Registered Number.	Occipito-nasal length. i.	Condylo-basal length. ii.	Zygomatic breadth. iii.	Lachrymal breadth. iv.	Width of postorbital constriction. v.	Breadth at occipital crest. vi.	Least depth of zygoma. vii.	Distance from foramen magnum to occipital crest. viii.	Width of nasal boss. ix.	Length of maxillary tooth-row. x.	Length of second upper molar. xi.
D. b. bicornis	180 miles N.E. of Lattakoo, S. Africa. Regd. 38.6.9.101.	645	—	357	290	121	195	62	—	154	265	51
		533	—	*295*	*240*	*100*	*161*	*51*	—	*127*	*219*	*42*
	Mashonaland. Regd. 84.8.1.1. (1365 n).	536	540	349	249	118	198	53	150	136	245	63
		454	*458*	*296*	*211*	*100*	*168*	*45*	*127*	*115*	*208*	*53*
	Mashonaland. Regd. 19.7.15.511.	591	580	369	288	119	215	58	166	143	273	58
		497	*487*	*310*	*242*	*100*	*181*	*49*	*143*	*120*	*230*	*49*
D. b. holmwoodi ...	Uaso Marra, Kenya Colony. Regd. 25.7.6.1.	544	561	320	250	111	188	48	154	143	260	55
		490	*505*	*288*	*225*	*100*	*169*	*43*	*139*	*129*	*234*	*50*
	Kenya Colony. Regd. 1918.6.17.1.	526	534	306	243	108	190	47	149	136	266	57
		487	*494*	*283*	*225*	*100*	*176*	*44*	*138*	*126*	*246*	*53*
	Kenya Colony. Regd. 7.2.26.1.	575	556	358	280	124	205	58	147	172	272	60
		464	*448*	*288*	*226*	*100*	*165*	*47*	*119*	*139*	*219*	*48*
	Longovata, Tanganyika Territory. Regd. 1937.7.23.1.	—	560	328	245	129	197	50	158	—	257	56
		—	*434*	*254*	*190*	*100*	*153*	*39*	*122*	—	*199*	*43*
	Itamba, Tanganyika Territory. Regd. 24.8.3.73.	485	523	293	224	103	173	44	152	112	233	57
		471	*508*	*284*	*218*	*100*	*168*	*43*	*148*	*109*	*226*	*56*

	Regd. 7.7.8.256.	500	—	311	228	112	170	34	146	121	200	—
		446	—	*278*	*204*	*100*	*152*	*30*	*130*	*108*	*178*	—
	Handeni District, Tanganyika Territory. Regd. 33.5.5.1.	510	510	289	206	107	181	42	152	109	185	—
		477	*477*	*270*	*193*	*100*	*169*	*39*	*142*	*102*	*173*	—
	Zomba, Nyasaland. Regd. 99.6.29.11.	—	565	—	240	122	165	50	154	—	225	59
		—	*463*	—	*197*	*100*	*135*	*41*	*126*	—	*184*	*48*
D. b. somaliensis ...	Somaliland. Regd. 11.8.2.20.	580	545	302	241	108	176	48	152	134	272	61
		537	*505*	*280*	*223*	*100*	*163*	*44*	*141*	*124*	*252*	*56*
	Abyssinia. Regd. 69.10.24.48.	497	—	281	219	104	170	36	—	114	237	62
		478	—	*270*	*211*	*100*	*163*	*35*	—	*110*	*228*	*60*
	Abyssinia. Regd. 71.11.29.4.	468	474	244	175	93	135	31	129	94	182	—
		503	*510*	*262*	*188*	*100*	*145*	*33*	*139*	*101*	*196*	—
	Jubaland. Regd. 23.10.20.18.	583	—	330	253	120	185	44	143	125	250	66
		486	—	*275*	*211*	*100*	*154*	*37*	*119*	*104*	*208*	*55*
	Abyssinia. Regd. 74.11.2.2.	582	534	328	248	112	188	54	147	140	245	57
		520	*477*	*293*	*221*	*100*	*168*	*48*	*131*	*125*	*219*	*51*
	Abyssinia. Regd. 76.9.26.6.	505	520	289	224	97	165	46	145	121	270	59
		521	*536*	*298*	*231*	*100*	*170*	*47*	*149*	*125*	*278*	*60*
	Abyssinia. Regd. 69.2.2.14.	550	532	310	241	119	197	45	144	129	268	66
		462	*447*	*261*	*203*	*100*	*166*	*38*	*121*	*108*	*225*	*55*
	Abyssinia. Regd. 76.2.15.5.	552	524	303	235	113	161	37	138	120	246	55
		489	*464*	*268*	*208*	*100*	*142*	*33*	*122*	*106*	*218*	*49*
	Abyssinia. Regd. 5.12.11.1.	—	438	250	175	99	132	29	125	—	176	—
		—	*442*	*252*	*177*	*100*	*133*	*29*	*126*	—	*178*	—
D. bicornis subspp. .	Angola. Regd. 2.5.6.1.	480	502	300	213	107	164	31	137	107	203	—
		449	*469*	*280*	*199*	*100*	*153*	*29*	*128*	*100*	*190*	—
	Northern Nigeria. Regd. 11.5.14.1.	480	493	273	174	101	146	31	147	102	184	—
		475	*488*	*270*	*172*	*100*	*145*	*31*	*146*	*101*	*182*	—

II. MEASUREMENTS AND ANALYSIS.

The skulls measured have been selected on the assumption that this species resembles the White Rhinoceros in breeding whilst the fourth milk-molar is still in use (Heller, 1913). Thus certain skulls are included which appear to be immature. That the result is not materially affected is proved by Table III, which is based solely on mature specimens.

The proportions, which are printed in italics, are based on the breadth of the postorbital constriction as 100 because several skulls have been mutilated in such a way as to destroy the condyles and basicranium. When the condylo-basal length was taken as standard, it was found that in the longer series, *D. b. holmwoodi* and *D. b. somaliensis*, the post-orbital constriction had an average value of 21·1 per cent. and 20·8 per cent. respectively. For the three skulls of *D. b. bicornis* the average value is 21·1 per cent.; for the two West African skulls it is 20·8 per cent. This close agreement makes it unlikely that the results based on the unusual standard should be vitiated thereby.

The Arithmetic Means of the measurements, and ratios calculated from the Means, are given in Table II, in which the Roman figures at the heads

TABLE II.

(Based on all the specimens, irrespective of age.)

	i.	ii.	iii.	iv.	v.	vi.	vii.	viii.	ix.	x.	xi.
D. b. bicornis	590	560	358	276	119	203	58	158	144	261	57
	496	*471*	*301*	*231*	*100*	*171*	*49*	*133*	*121*	*219*	*48*
D. b. holmwoodi.....	523	544	315	239	114	184	47	151	132	237	49
	459	*477*	*276*	*210*	*100*	*161*	*41*	*132*	*116*	*208*	*43*
D. b. somaliensis	540	517	271	223	107	168	41	140	122	238	61
	505	*483*	*253*	*208*	*100*	*157*	*38*	*131*	*114*	*222*	*57*

of the columns correspond to those at the heads of the columns in Table I. From the mean measurements it is evident that there is a reduction in size as the species is traced from the South to the North of its range, and that the length of the second upper molar (col. xi) is greater in *D. b. somaliensis* than it is in the other subspecies.

This is confirmed by the proportions. In *D. b. holmwoodi* the condylo-basal length (col. ii) is slightly greater than in *D. b. bicornis*, whereas all the other proportions are less. In *D. b. somaliensis* the occipito-nasal length (col. i), the condylo-basal length (col. ii), the length of the upper cheek-teeth (col. x), and the length of the second upper molar (col. xi) are in excess, whereas the remaining dimensions are less than in *D. b. bicornis*.

Since this result might be affected by the greater average age of the three skulls of *D. b. bicornis* compared with the average age of the other two series, Table III was drawn up to include only those specimens of approximately the same age.

TABLE III.

(Based on fully mature specimens only.)

	i.	ii.	iii.	iv.	v.	vi.	vii.	viii.	ix.	x.	xi.
D. b. bicornis	590	560	358	276	119	203	58	158	144	261	57
	496	*471*	*301*	*231*	*100*	*171*	*49*	*133*	*121*	*219*	*48*
D. b. holmwoodi.....	548	553	328	255	118	195	51	152	150	264	57
	464	*469*	*278*	*216*	*100*	*165*	*43*	*129*	*127*	*224*	*48*
D. b. somaliensis	554	531	306	242	110	177	46	145	129	211	60
	504	*483*	*278*	*199*	*100*	*161*	*42*	*132*	*117*	*192*	*55*

In these specimens the proportions of the skull of *D. b. holmwoodi* are less than those of *D. b. bicornis* except the width of the nasal boss (col. ix) and the length of the upper tooth-row (col. x), which are greater. The length of the second upper molar (col. xi) and the condylo-basal length (col ii) are practically the same as those of the typical form.

In *D. b. somaliensis* the proportions which are in excess are the occipito-nasal length (col. i), the condylo-basal length (col. ii), and the length of the second upper molar (col. xi). The width of the nasal boss (col. ix) is somewhat less than that of *D. b. bicornis*.

There are no specimens of young animals from South Africa with which the skulls from West Africa may be compared, but Table IV includes those skulls of other forms which are at about the same stage of growth.

TABLE IV.

(Based on young specimens only.)

	i.	ii.	iii.	iv.	v.	vi.	vii.	viii.	ix.	x.
D. b. holmwoodi.....	498	516	298	226	107	175	40	150	114	206
	466	*482*	*279*	*211*	*100*	*164*	*37*	*140*	*107*	*192*
D. b. somaliensis	468	474	244	175	93	135	31	129	94	182
	503	*510*	*262*	*188*	*100*	*145*	*33*	*139*	*101*	*195*
Angolan subsp.	480	502	300	213	107	164	31	137	107	203
	449	*469*	*280*	*199*	*100*	*153*	*29*	*128*	*100*	*190*
N. Nigerian subsp. ...	480	493	273	174	101	146	32	147	102	184
	475	*488*	*270*	*172*	*100*	*144*	*32*	*146*	*101*	*182*

It will be noticed that in the West of Africa, as in the East, the northern skull is longer and more slender than that from the South, and that, despite its slightly greater age, the former has the shorter tooth-row (col. x).

III. SYSTEMATIC.

RHINOCEROS BICORNIS Linnaeus. In the early days of systematic Zoology there was great uncertainty about the status of the Black Rhinoceros. Pennant (1771), for example, regarded two-horned animals as a variety of the one-horned species, and, although he rejected the Linnaean classification in favour of that of Buffon, he was supported in this view by the twelfth edition of the

'Systema Naturae'. It was not until the turn of the century that the name *R. bicornis* began to find general acceptance as the designation of the African rhinoceros. Even so, it remained a matter of convention rather than conviction, and Oldfield Thomas (1911) said that it is 'always accepted as the African Two-horned Rhinoceros. Type locality not determinable, except that the Cape may generally be considered the place whence early specimens were brought. "Habitat in India" may, as usual, be entirely ignored.' That this last remark is less than fair to Linnaeus may be seen from a study of the sixth, tenth, and twelfth editions of the 'Systema Naturae' and of the sources quoted in them.

There are two kinds of Rhinoceros mentioned in the sixth edition, namely,

1. Rhinoceros cornu unico conico—Enhörning ;
2. Rhinoceros cornibus duobus cuneiformibus,

but no authority is given for either.

In the tenth edition these diagnoses are reproduced. To the first the trivial name *unicornis* is allotted, other authors are quoted, the habitat is given as Africa and India, and details of the external appearance of the animal are added. The second diagnosis is allotted the trivial name *bicornis*, there is a reference to the sixth edition, and then three lines of text, thus :

> '*Habitat in* India. Kolbius, Jacobaeus, Schroeckius.
> *Species obscura, cranium tantum cum cornibus duobus compressus altero minori supra alterum nobis visum*'.

By the time the twelfth edition was issued, Linnaeus had changed his mind and reduced *R. bicornis* to the level of a variety. He placed it immediately after the references for *R. unicornis*, and transferred the description of that species so that it applies to both forms. In this edition the only reference given for *R. bicornis* is to the tenth edition, and the names Kolbius, Jacobaeus, and Schroeckius are omitted.

Presumably Linnaeus placed these three names in that order to indicate their relative importance as sources of information. If this is so, then Kolbius must be taken as his chief authority. Even if the order is accidental, it still remains true that the account in Kolbius (1719) is the most detailed of them all, and the only one which describes the animal, its habits, and its uses accurately, and from first-hand knowledge.

Linnaeus, however, took the locality from Jacobaeus, who says (1710, no. 31) that the specimen in the Museum of the King of Denmark was killed in the menagerie of the Great Mogul of India, whence the horns were brought to Copenhagen by merchants trading to the East and presented to King Christian V. Moreover, in discussing Item 33, 'Corium rhinocerotis', Jacobaeus says that the animal is plentiful in Bengal, Cambay, Malacca, Sumatra, Siam, and other regions. Possibly the specimen which reached Copenhagen was of the Sumatran Rhinoceros, but the horns figured by Jacobaeus (op. cit. pl. iv, fig. 31) appear to be those of the Black Rhinoceros.

'Historia Moschi' by Schroeckius is concerned with the sources of supply of Musk, and with its properties. The work is largely medical. Despite a fairly close examination I have not been able to find any reference to Rhinoceroses, though they may be hidden somewhere in the 224 closely printed pages.

There will be no dispute that it is most desirable to retain *R. bicornis* as the name of the Black Rhinoceros. In order to do so with the strictest regard for the rules of nomenclature, it is necessary to take the animals mentioned by Kolbius, Jacobaeus, and Schroeckius as the syntypes of *R. bicornis*; to assume that that mentioned by Jacobaeus is the Sumatran Rhinoceros, and that if Schroeckius does refer to a rhinoceros it is indeterminate. The animal described by Kolbius is here chosen as the LECTOTYPE, and the name *Rhinoceros bicornis* is properly restricted to the Black Rhinoceros, with the Cape of Good Hope as the type-locality.

Of the type-specimen there is little to say. We are told that it was a skull, 'cranium tantum . . . . . nobis visum', but that is all. That the specimen mentioned in the 'Mus. Adolphi Friderici' cannot, even if it still exists, be taken as the type, is shown by the following description given by Linnaeus, 'Cornu hujus inferium politum et artificis manu in tria cornua efformatus ex uno s. majore, quorum intermedium duplo majus est; non vero trilobum natum fuit'.

Rhinoceros bicornis capensis Camper is mentioned by Lydekker (1916, p. 54) as a variety. It does not occur in Camper's well-known paper, 'Dissertatio de Cranio Rhinocerotis Africani, Cornu Gemino', which is the source quoted by Lydekker, and I have been unable to trace it elsewhere. In this connexion it should be noted that the names employed by Camper are usually in the vernacular, and that they appear in a Latin form because Camper wrote in Latin.

Rhinocerus cucullatus Wagner is said by Lydekker to have been obtained in Abyssinia, but this is a mistake. Wagner (1835, p. 318), when answering his own question concerning the locality of the type-specimen, says, 'Da indess dieser Punkt im Lauf der Zeiten schon noch ermittelt werden wird, so ist es besser, ihn einstweilen so unbestimmt zu lassen, als er es nun einmal ist'. He himself had grave suspicions that the type was an artifact, and although he finally concluded that it was not. most other workers have disagreed with him (cf. Schwarz, 1920, p. 871). Possibly the idea that it occurs in Abyssinia may have arisen from the chance that Wagner discusses the Rhinoceros described by Bruce.

Rhinoceros keitloa A. Smith is also worthy of mention as a relic of the early days of scientific investigation in South Africa. The original description:

'*Rhinoceros keitloa*. Colour a rusty greenish yellow, clouded with pale olive brown; horns of equal length, the anterior one curved and rounded, the posterior straight and laterally compressed. Size of the Rhinoceros Africanus. Inhabits the country north and south of Kurrichaine' (Smith, 1836,

p. 44), is contained in a very scarce booklet published in Cape Town with the title ' Report of the Expedition for exploring Central Africa from the Cape of Good Hope '.

The name next appears, in 1837, on p. 7 of the ' Catalogue of the South African Museum now exhibiting in the Egyptian Hall, Piccadilly. The property of a Society entitled " The Cape of Good Hope Association for exploring Central Africa " '. It is there stated that *Rhinoceros Ketloa* (*sic*) was shot about 180 miles N.E. of Lattakoo.

In the following year, 1838, when the collection was sold at the Egyptian Hall by Messrs. J. C. & S. Stevens, the skull of *Rhinoceros keitloa*, which is the holotype, and which is listed as Lot 282, was purchased by the Trustees of the British Museum. It is now preserved in the Department of Zoology, and bears the number 38.6.9.101 in the Departmental registers.

Copies of the Report of the Expedition, of the Catalogue of the Museum, and of the Sale Catalogue, are among the collection of tracts formed by the late Dr. J. E. Gray, F.R.S., now in the Library of the Department of Zoology of the British Museum, but they appear to have been unknown to Schwarz (1920, p. 870). Lydekker (1916, p. 54) appears to have been unaware of the Report of the Expedition.

Kurrichaine and Lattakoo no longer appear in modern atlases. Lattakoo (Lat. 27° 10′ S., Long. 24° 30′ E.) has been abandoned in favour of New Lattakoo, now called Kuruman ; and Kurrichaine (Lat. 25° 42′ S., Long. 27° 9′ E.) is just over the Transvaal border to the North East of Mafeking. The geographical positions are taken from Johnston's National Atlas published in 1850.

This supposed species is nothing more than an individual variation which occurs throughout the entire range of the Black Rhinoceros from the Cape to Abyssinia, and is not restricted to either sex. (See also Selous, 1881.)

RHINOCEROS BICORNIS HOLMWOODI Sclater, 1893, was based on two horns purchased in Zanzibar, which were thought to have been obtained ' from the country of " Udulia ", situated at the N.E. point of Usukuma, 50 miles south of Speke Gulf '. Of the two syntypes figured by Sclater, the original of the straighter one, fig. 1, is in the British Museum (regd. 94.3.3.1). This specimen is here chosen as the LECTOTYPE.

The diagnosis may be extended to include the following characters :—

SKULL MORE SLENDER, NASAL BOSS WIDER, MAXILLARY TOOTH-ROW LONGER THAN IN *DICEROS BICORNIS BICORNIS*.

RHINOCEROS BICORNIS SOMALIENSIS Potocki, 1897, first appeared in an account of the author's hunting trip to British Somaliland which was published in Warsaw. This edition was unknown to Lydekker and Schwarz, both of whom refer to the English translation issued in London three years later. Through the kindly interest of Counts Joseph and Alfred Potocki, the son and nephew of the author, the Trustees of the British Museum have been able to acquire a copy of the Polish edition for the Library of the Department of Zoology.

Potocki recalls that Swayne was the first to shoot rhinoceros in Somaliland, and says that the animal was recognized as a separate variety by the English naturalists. When he published the name in the text without diagnosis or citation, he was, doubtless, under the impression that it had already appeared in print. There is no evidence of prior publication, however, and I have vainly searched all the literature based on Swayne's collections for this name. Under these circumstances Potocki must be credited with the authorship.

Despite the absence of a diagnosis, the name is not a *nomen nudum*, because the author gives five figures of two adult animals which he shot in Somaliland. These animals are the syntypes of the species, and it is necessary to select one of them as the lectotype. Lydekker (1916) says 'Type, the figure in Count Potocki's work', but does not say which he means. The most appropriate figure would be that on the plate 'Moj pierwszy nosorozec' facing p. 80, because it represents the animal under discussion on p. 82 where the name first occurs. On the other hand, the plate 'Nosorozec (Rhinoceros bicornis)', facing p. 104, is obviously of a mounted head, and displays the details of the specimen. It is quite certain that this specimen was shot in Somaliland, and that it is identical with the animal shown in the tinted figure on p. 102, for the left ear of both has the same shape slit on the margin. Hence Scharwz was mistaken when he claimed that this was the head of an Indian animal with a second horn added. On the whole, it is better to select the head depicted on the plate facing p. 104 as the lectotype.

Concerning this specimen, Count Joseph Potocki writes, 'Unfortunately most of my father's trophies perished during or immediately after the War—among them the stuffed head of that species of Rhino as well as the stuffed full specimen of the baby Rhino which my father brought back from Somaliland in 1896 but which did not survive the journey'. On this account, I hereby select the skull of an animal shot in Somaliland by Major R. E. Drake-Brockman (regd. 11.8.2. 20) as the NEOTYPE of the subspecies *R. bicornis somaliensis* Potocki. This is the skull of which a figure and brief description were published by Lydekker in 1911.

The extended diagnosis is :

SKULL RELATIVELY LONGER AND MORE SLENDER THAN IN THE TYPE, LENGTH OF SECOND UPPER MOLAR GREATER, BUT LENGTH OF MAXILLARY TOOTH-ROW LESS.

It is clear from the following diagnoses, in which the East African form is taken as standard, that the skulls from West Africa probably belong to new subspecies. Nevertheless, they have not received separate names because they are derived from immature animals, and also because there are no skulls of the typical race at the same stage of growth in the British Museum.

Angolan race.—Skull shorter than in *D. b. holmwoodi*, occipital plate lower.

Nigerian race.—Skull longer and narrower than in *D. b. holmwoodi*, occipital plate higher, maxillary tooth-row shorter.

IV. ACKNOWLEDGMENTS.

I am indebted to my friends and colleagues in the Department of Zoology for unrestricted access to the material here dealt with, and for their kindness in clearing up various points which to me were obscure ; Mrs. Cecil Symmes, the High Commissioner for South Africa, and the staff of the Royal Geographical Society have been most helpful in matters concerning the geography of South Africa ; and Dr. W. D. Lang, F.R.S., has given me valuable assistance with nomenclatorial problems. Finally, I would express my grateful thanks to Counts Alfred and Joseph Potocki for their help in dealing with the writings and collections of the late Count Potocki.

V. SUMMARY.

Measurements and proportions of twenty-one skulls of *Diceros bicornis* (Linnaeus) are analysed and discussed.

The works quoted by Linnaeus have been examined, and a type-locality for the species selected in accordance with the evidence contained in them.

D. b. holmwoodi (Sclater) and *D. b. somaliensis* (Potocki) are diagnosed by means of their skull-characters, and a NEOTYPE is selected for the latter.

Attention is drawn to the probable existence of two distinct subspecies in West Africa.

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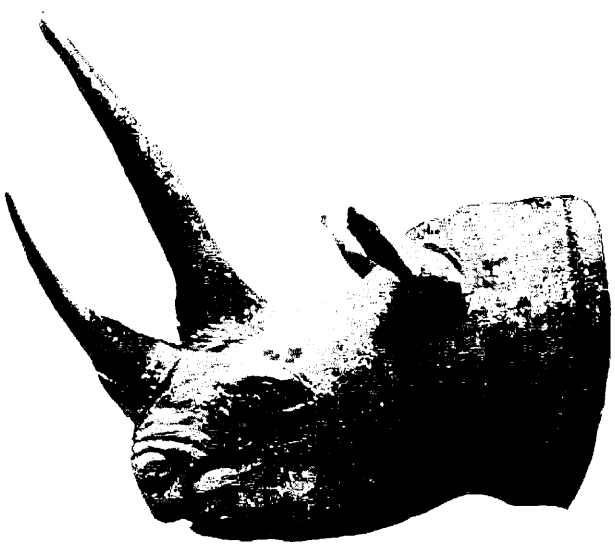

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