specimens he could procure, this relationship appeared to be constant.

In this connection I wish to observe that the structure of a rhinoceros molar is such that the length of the anterior surface decreases towards the top of the crown, while the length of the external surface increases towards the top. Consequently in a molar of *Rh. sivalensis* it will depend upon the stage of wear whether "the greatest length of the anterior surface" will be equal to or greater than "the greatest length of the external surface". It will, therefore, be clear, I believe, that the distinguishing character, which LYDEKKER discovered, will be very difficult to handle.

Now it will be remembered that the only character, which DUBOIS mentions of *Rh. sivasondaicus*, is that its molars are intermediate in this respect. I may add, that if afterwards, *Rh. sivasondaicus* should turn out to be a distinct species, we shall certainly have to admire DUBOIS for his not overlooking such a very subtle detail. As already stated, STREMME did not succeed in using this character. As to the teeth of my own fossil form they are in this respect indistinguishable from those of *Rh. sondaicus*.

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Rhinoceros sondaicus DESM. fossilis.

Rhinoceros sp., G. Busk, Proc. Zool. Soc. London, 1869, p. 409, text figs. 1—4.
? Rhinoceros sondaicus Cuv. in: R. Lydekker, Cat. Foss. Mamm. in the Br. Mus. part III, 1886, p. 129.

BUSK described and figured a left and right fossilized M^2 of rhinoceros belonging to a species "not distinguishable by its dental characters from R. *sondaicus*" [1]). They were obtained from Sarawak (Borneo). Exact locality unknown. LYDEKKER provisionally referred to *Rh. sondaicus* two M^1 or M^2 of opposite sides, and three lower cheekteeth, from a depth of sixty feet in a cavern deposit at Sarawak. The upper molars were said to present all the characters of those of R. *sondaicus*.

Rhinoceros sondaicus DESM.

Rhinoceros sondaicus, Desmarest, Mammalogie, 1822, p. 399.
Rhinoceros javanicus, F. Cuvier, Hist. nat. des Mammifères, III, liv. 45, 1824, p. 2.

Of this recent species the present writer was able to examine and measure thirteen crania of adult and old individuals, being in six, and the Zoological Institute of the University of Utrecht two. In one specimen (n°. 10 of table K) the lower jaw could not be removed without demolishing the specimen. That is the reason why length and breadth of the cheekteeth of this specimen have not been given in table N. In cranium n°. 4 only left M^2 and M^3 were present. Cranium n°. 6 wanted left P^1—M^2. Furthermore from table N will be noticed that in four specimens P^1 either side is absent. In nearly all cases, there are, however, clear indications that this loss has taken place after the death of the animal.

Before proceeding with a discussion of the individual variation which exists both in cranium, and permanent upper cheekteeth dentition, it will be desirable to call attention to the various tables of measurements.

Table K contains, besides the measurements of the thirteen crania, already mentioned, those of:

one cranium [1]) of *Rh. sondaicus*, borrowed from FRANZ TOULA, Das Nashorn von Hundsheim, Abh. K. K. Geol. Reichsanstalt, XIX, 1902, table;

two crania of the same species, borrowed from CUVIER, Recherches sur les ossements fossiles, 1822, p. 37;

one cranium of *Rh. sivalensis*, derived from BAKER and DURAND, 1836, p. 502;

one cranium of *Rh. sivasondaicus*, derived from STREMME, 1911, p. 90 and 94;

the two fossil specimens of our own collection.

As to the measurements themselves we followed for the greater part STREMME who in his turn partly joined TOULA.

In table L all the values are expressed in % of measurement 13. The total length of the cranium could not be used as unit, because of three crania the total length was unknown. Maxima and minima have been heavy printed for *Rh. sondaicus*.

Table M contains a number of relations of certain measurements. As to the choice of the measurements we followed STREMME as

[1]) At the time that TOULA measured this specimen, it was preserved in the Nat. Mus. of Nat. Hist. at Leyden. Apparently it has been exchanged later on.

[1]) p. 415. p.71) all 13 specimens the M3 to a smaller or greater extent abraded by wear. The Leiden mus. contained 5 spec. the museums of Natural Arts Magistra 6, and the Zool. Inst. of Utrecht, 2

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F. H. van der MAAREL, Contribution to the knowledge of the fossil mammalian fauna of Java.
Wetensch. Mededeel. dienst mijnbouw Ned. Indië, nr. 15 (1932)
pp. 1, 1-208, pls. I-XX, tabl. A-Z.

far as possible. For *Rh. sondaicus* the greatest and smallest number of each horizontal row have been heavy printed.

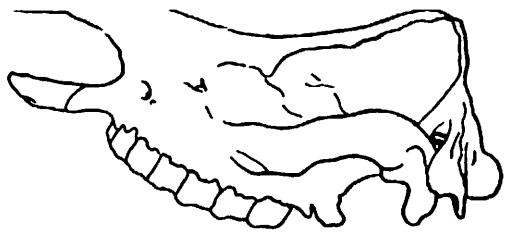
In table N the length, breadth (both measured at the base of the crown) and the relation length : breadth of each cheektooth have been united. Why this table does not contain — in contradiction to STREMME's table — measurements of premolars and molars of *Rh. sivalensis* will be clear, I believe, after what has been stated in the foregoing part. Originally we added to table N also the measurements of two cheekteeth sets which will be found mentioned on p. 39 of CUVIER's paper quoted. When it appeared, however, that in P^2—M^2 of one of these rows the relation $\frac{\text{length}}{\text{breadth}}$ not inconsiderably exceeded the highest value found in the corresponding teeth of twelve foregoing crania it was thought better to exclude them from our table.

As will be seen we have given all dental measurements in mm. STREMME, however, in tenths of mm. In my opinion this is absolutely superfluous. For, though the structure of a rhinoceros tooth certainly permits exact measuring of the breadth, it surely does not allow of measuring the exact length of the tooth. Moreover it must not be forgotten that length as well as breadth of corresponding teeth of opposite sides may differ distinctly.

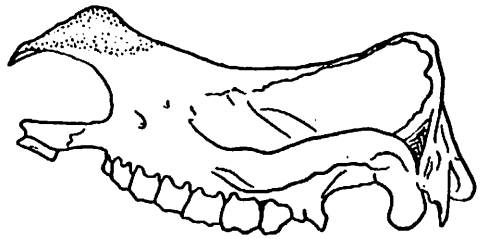
In table O, at last, the breadth and length have been expressed in % of resp. the breadth and length of the fourth premolar. Both in table N and O maxima and minima found for the teeth of *Rh. sondaicus* have been heavy printed.

We shall now return to the measurements of the sixteen crania of *Rhinoceros sondaicus*. Both from table L and M it will be seen that even such a relatively small number of specimens already may show a considerable individual variation. Especially concerning some points there appears to exist noticeable differences between the crania of the present species. In this respect we may bring forward:

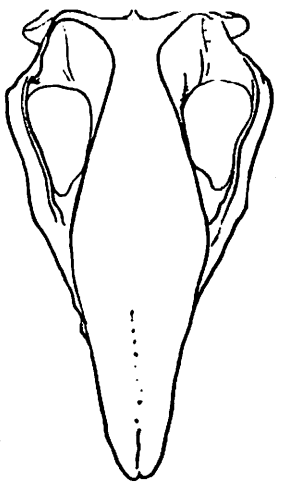
a. The great differences in degree of depression of the frontal region; smallest in cranium n°. 5 (text fig. 7), greatest in cranium n°. 8 (text fig. 8). Both text figures show, moreover, clearly that a feeble frontal depression coincides with slightly curved nasals. Table L exhibits, furthermore, decidedly that whereas the difference between the greatest and smallest value, found for m. 6 in 16 crania of *Rh. sondaicus* is 18 %, the greatest value is exceeded by no less than 22 % by the only cranium of *Rh. sivalensis*.



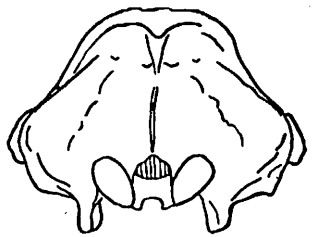
Text fig. 7.



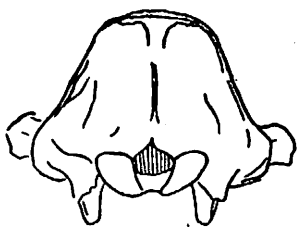
Text fig. 8.



Text fig. 9.

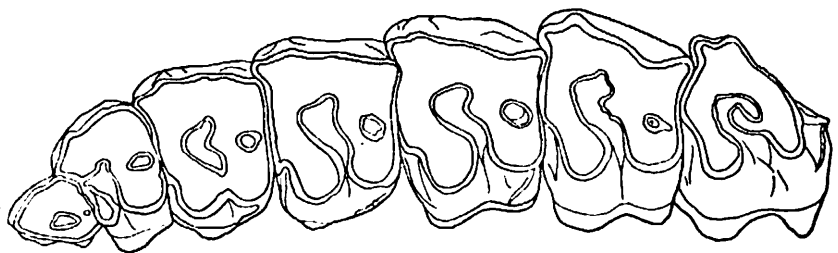


Text fig. 11.



Text fig. 12.

Text fig. 10.



Text fig. 13.

Text figs. 7—13. *Rhinoceros sondaicus* (recent). Text figs. 7—12 of approximate equal size ($^1/_9$ nat. size). Text fig. 13 ($^1/_2$ nat. size).

in cranium nº. 2 (text fig. 9), widest in cranium nº. 1 (text fig. 10). The specimen of *Rhinoceros sivalensis* appears to have a still broader forehead than the specimen of *Rh. sondaicus* drawn in text fig. 10.

c. The surprising variability in development and distance between the cristae fronto-parietales.

d. The distinct differences in shape of the occiput; broad and therefore relatively low in cranium 13 (text fig. 11), narrow and comparatively high in cranium 3 (text fig. 12).

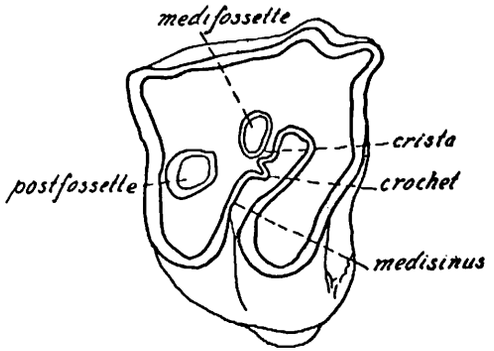
Notwithstanding the considerable, individual variation in these 16 crania of *Rh. sondaicus*, their measurements show in general decidedly that the specimen of *Rh. sivalensis* of table L must be specifically distinct.

As to the individual variation of the dental measurements I may refer to table N and O. Of the structure of the premolars and molars of the recent species we may give the following summary.

P1 rather small, but not deciduous. Deuterocone of P2 more or less isolated. P3 in general entirely molarized; top of deuterocone very seldom free. Deuterocone and tetartocone rather closely approximated in all the P, especially near the base of the crown, so that union takes place after prolonged wear. Postfossette distinctly more shallow than medisinus; consequently very worn teeth only present one pit, namely the buccal part of the medisinus. Crochet generally well developed, occasionally double. No antecrochet. As a rule no crista and medifossette. The crochet is well defined, towards the base it becomes more blunt. Ectoloph with distinct parastyle (protostyle), paracone (protocone) fold, and paracone (protocone) style.

In M2 and M3 metastyle. Outer cingulum always absent; inner cingulum either absent in the molars or sometimes represented by a small tubercle at the entrance to the medisinus. Inner cingulum may also be absent in the P; it is, however, mostly present in the form of a very fine row of incipient tubercles. Seldom this row surrounds the whole of the internal side. Sometimes a short row of tubercles is situated in the vicinity of the entrance to the medisinus, in other cases it is attached to the tetartocone, more often, however, to the deuterocone. Anterior and posterior cingulum either smooth or finely crenulated. In M3 posterior cingulum generally represented by a distinct tubercle at the postero-external of the crown. An incipient secondary enamel fold in the postfossette of the premolars may occasionally occur.

peculiarity. The right P3 of cranium nº. 2 appeared to be in the possession of a well developed crista which had regularly united with the crochet, forming a medifossette. It is remarkable that none of the other teeth of the cranium in question show any trace of a crista. By the kindness of the director of the Nat. Mus. of Nat. Hist., Prof. Dr. E. D. VAN OORT, I am enabled to give in text fig. 14 an upper view of the specimen, made after a photograph, taken for me in Leyden.



Text fig. 14. Right P3, abnormally developed, of *Rhinoceros sondaicus*. 4/5 nat. size.

After having dealt with cranium and cheekteeth of *Rh. sondaicus* so extensively, we shall try to answer the question:

Is the form, which STREMME described under the name of *Rh. sivasondaicus*, in reality specifically distinct from *Rh. sondaicus*, or will it be possible to identify STREMME's form with the recent species with the help of the more ample materials of the latter we had at our disposal?

After a detailed comparison of the fossil cranium of his collection with that of an old ♂ and a young ♀ of *Rh. sondaicus*, STREMME concluded: "Weist so die allgemeine Schädelform nur Unterschiede von der rezenten auf, die innerhalb der individuellen Variationsbreite liegen können, so bestehen doch in der Bezahnung Abweichungen, die die Aufstellung einer neuen Art gerechtfertigt erscheinen lassen"[1]). My own tables L and M show that the correctness of STREMME's first supposition is entirely proved by the facts.

The differences in the dentition which STREMME noticed are:

1. Equally worn cheekteeth of the recent species revealed ". . . . eine länglichere, schwach eingedrückte vordere Grube [2]) und einen schärferen, bei einzelnen Zähnen geteilten Sporn". [3])

2. ". . . der erste Prämolar, der bei allen rezenten Java . . . Nashörnern . . . ein verkümmerter und schon bei nicht allzuhohem

[1]) p. 91.
[2]) Meant is "prefossette".
[3]) p. 91.

Alter abgekauter Zahn war, ist hier bei der abgekauten Zahnreihe des fossilen Nashorns noch relativ stattlich und zeigt zwei deutliche Gruben".

3. When length and breadth of the cheekteeth of STREMME's form and those of *Rh. sondaicus* were expressed in % of resp. length and breadth of P^4, it was shown that STREMME's form gave on the whole greater values.

Concerning the presumed first and second difference, I am convinced they will be invalidated much more rapidly with the help of a comparison of the right toothrow of STREMME's specimen with the corresponding set of cranium 5 of *Rh. sondaicus* and drawn (after a photograph) in text fig. 13, than by means of a lot of words.

As to the third difference I may refer to my own table O. Though I immediately admit that still the breadth of P^1, P^3 and M^1 of "*Rh. sivasondaicus*" show the greatest values, we may be absolutely sure that also these differences would disappear, if but we had been able to collect the measurements of some more crania of the recent *Rh. sondaicus*.

As, moreover, the other rhinoceros remains, which STREMME described, do not afford any reason for specific distinction I conclude:

The fossil form described by STREMME *under the name of Rh. sivasondaicus* DUB. *is specifically indistinguishable from the recent Rh. sondaicus, and must therefore be called Rhinoceros sondaicus* DESM. *fossilis.*

At last our own fossil cranium (specimen *a* of the tables).

Both from the tables and from comparison of the description of the specimen in question with our enumeration of cranial and dental characters and peculiarities of *Rh. sondaicus* appears — without leaving a shade of doubt — that also our form is specifically identical with the recent *Rh. sondaicus*, and consequently also with STREMME's specimen.

APPENDIX.

ON THE TERMS APPLIED TO THE PRIMARY AND SECONDARY ELEMENTS OF UPPER PREMOLARS AND MOLARS IN GENERAL AND THOSE OF RHINOCEROS IN PARTICULAR.

The terminology of primary and additional cusps of upper premolars and molars, based upon the tritubercular theory of COPE—OSBORN, was originally as follows:

Primary cusps	Protocone	for	Antero-internal cusp
	Hypocone	„	Postero- „ „
	Paracone	„	Antero-external „
	Metacone	„	Postero- „ „
Additional cusps	Protoconule	„	Antero-intermediate „
	Metaconule	„	Postero- „ „

SCOTT's [1]) investigations, however, lead him to the conclusion that the cusps of the premolars were not homologous with the corresponding ones of the molars. Accordingly he proposed a series of new names, which are for the primary cusps of upper premolars as follows:

Primary cusps	Protocone	analogous with	paracone	of molars
	Deuterocone	„ „	protocone	„ „
	Tritocone	„ „	metacone	„ „
	Tetartocone	„ „	hypocone	„ „

As regards the upper premolars OSBORN accepted in full SCOTT's interpretation.

SCOTT was convinced that the conules of the premolars were not homologous with those of the molars. ("In position these conules correspond to the proto- and metaconules of the molars, but are obviously not homologous with them") [2]). He

[1]) The Evolution of the Premolar Teeth in Mammals. Proc. Acad. Nat. Sci., Philadelphia, 1893, p. 405—444.

[2]) Loc. cit. p. 413.

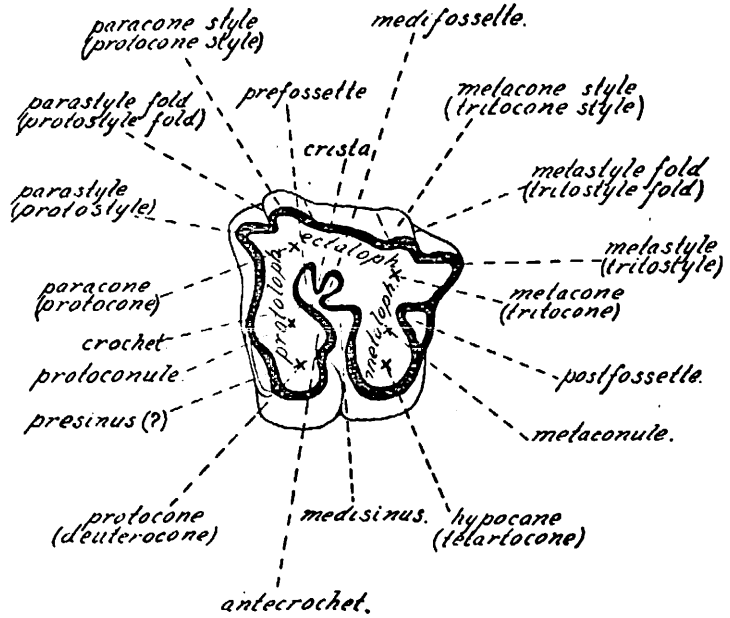
committed, therefore, an incompleteness in not proposing new names for the conules of the premolars. OSBORN, too, failed to do so.

I should not have been at all surprised if OSBORN had not accepted SCOTT's new names for the primary cusps of the upper premolars. This assertion will be sufficiently explained by the following quotation. OSBORN [1]) in dealing with the subject of nomenclature observes: ". . . . the system of terms was originally based upon the actual homologies of the primary elements of the trigon and trigonid, but in extending it to the other parts of the crown and to the secondary cusps it was found that we must apply similar terms to some of the later elements in the upper and lower teeth, which are merely analogous to each other . . . ., *otherwise the terms soon multiply, so as to become a burden rather than a convenience*" [2]).

Perhaps the present writer should not have ventured to draw attention to these points, were it not that OSBORN had been inconsistent in another point. At the same time that OSBORN introduced the terms proto-, para-, meta- and hypocone for the primary cusps of the upper premolars and molars, he proposed namely some new names for the peripheral pillars, which occur in the upper cheek teeth of all ungulates. In view of the rhinoceros premolar and molar there are two pillars which may interest us, namely those which OSBORN gave the names of parastyle and metastyle, the prefixes (para-, meta-, etc.) being applied ". . . according to their proximity to the cones . . . ." [3]). One should expect that OSBORN after acceptance of SCOTT's terms "proto-, deutero-, trito- and tetartocone" for the primary cusps of the upper premolars, should have named the antero-external and postero-external pillar of the premolar resp. protostyle and tritostyle, instead of parastyle and metastyle. He did not, however. See e. g. figs. 116 and 192 in OSBORN's work "Evolution of Mammalian Molar Teeth".

Some subsequent investigators — I may mention ZDANSKY [4]) and COOPER [5]) — apparently met with the same inconsistency, for they use the term protostyle for the antero-external pillar of the premolars. It is, however, an enigma to me, why COOPER — in whose specimens of premolars also the postero-external pillar was developed — does speak of protostyle, and not of tritostyle instead of metastyle [1]).

Turning now to the rhinoceros premolar and molar of the upper jaw, we have only some remarks to add. After what preceded



Text fig. 15. Diagram of a hypothetic left upper cheek tooth of rhinoceros showing the terms applied to the various components of upper premolars and molars. (The terms which only refer to premolars are placed in parenthesis.)

it will need no explanation why we used, in describing the premolars of *Rhinoceros sondaicus fossilis*, the terms protostyle fold and protocone style. As to the greater part of the remaining terms I may refer to text fig. 15. It will only be desirable to pay attention to OSBORN's terms praesinus, medisinus and postsinus. As far as my knowledge goes OSBORN gave twice viz., in 1898 [2]) and 1907 [3]), a table in order to show the parallelisation between his terms and those of former authors. Of course hereafter only the terms applied to the rhinoceros tooth will interest us. His table of 1898 contains the terms medisinus and postsinus, which he regarded as identical with resp. anterior and posterior valley of the English authors

[1]) Evolution of Mammalian Molar Teeth. Biological Studies and Addresses, vol. I, 1907, p. 69.

[2]) The italics are ours.

[3]) OSBORN (1907), p. 70.

[4]) OTTO ZDANSKY, Die Säugetiere der Quartärfauna von Chou-k'ou-tien. Palaeontologia Sinica, Ser. C, V, fasc. 4, 1928.

[5]) C. F. COOPER, On the skull and dentition of the Paraceratherium bugtiense. Phil. Trans. Royal Soc. of London, Ser. B, vol. 212, 1923—1924.

[1]) See e. g. COOPER, p. 382.

[2]) The extinct Rhinoceroses. Mem. Amer. Mus. Nat. Hist. I, pt. 3, 1898.

[3]) Loc. cit.

TABLE L.

		Rhinoceros sivalensis.	"Rhinoceros sivalensis."	Our own fossil specimens.		RHINOCEROS SONDAICUS.														
		A	α	a	b	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Greatest length of cranium (from tip of nasals to posterior surface of occipital condyles)	—	625	648	ca 581	649	653	652	638	640	637	613	651	655	651	642	628	643	605	—	—
2	Greatest width of ditto (interval between outer surfaces of zygomatic arches)	—	—	362	372	356	351	353	364	365	345	332	353	361	338	354	357	370	—	—	—
3	Breadth between proc. postorbitales of frontals	226	203	200	189	219	179	186	195	183	192	191	188	182	189	204	216	198	189	176	205
4	Transverse width of nasals below vertex of nasal arch	155	99	112	133	99	93	90	91	81	93	94	99	100	99	107	106	104	89	89	99
5	Least distance between the cristae fronto-parietales	—	37	54	—	ca 42	59	68	54	56	69	62	51	49	38	60	61	54	72	—	—
6	Perpendicular from a line tangential to the summit of occipital crest and vertex of nasal arch to the depression of frontals	88	—	67	—	59	57	48	64	48	60	58	66	65	59	65	59	61	—	—	—
7	Greatest breadth of occiput	304	282	306	—	308	301	280	317	289	298	285	315	307	287	302	307	334	278	302	315
8	Interval between outer angles of occipital condyles	174	140	137	—	154	152	132	152	139	144	132	133	154	137	149	144	150	133	149	137
9	Horizontal diameter of for. magnum	—	50	46	—	50	45	47	48	50	50	47	47	48	47	44	49	47	47	44	44
10	Height of occiput (from lower edge of for. magnum to summit of occipital crest	231	203	198	—	227	218	216	220	226	211	228	222	223	221	229	220	229	—	201	226
11	Interval between naso-maxillary notch and tip of nasals	—	159	146	ca 133	161	163	162	161	159	157	147	156	163	167	163	150	158	164	—	—
12	Interval between ditto and anterior border of orbit	—	113	120	ca 110	118	107	112	164	106	108	101	118	109	106	102	111	107	120	—	—
13	Distance from posterior surface of occipital condyle to anterior border of orbit of the corresponding side	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
14[1]	Distance from anterior border of orbit to posterior border of meatus auditorius externus	—	—	325	—	308	330	336	312	326	322	317	327	323	328	304	325	334	—	—	—
15	Height of vertex of nasal arch above palate	212	159	155	ca 142	ca 155	154	137	163	136	147	141	178	172	ca 142	160	147	170	—	—	—
16	Total length of the seven molars	289	259	273	—	251	272	251	—	245	242	253	259	256	276	247	253	261	—	254	—
17	Length of premolar series (measured at the buccal side)	—	—	136	—	126	142	124	—	125	119	128	137	133	137	128	125	134	—	—	—
18	Distance between internal extremities of fossae glenoidales	—	90	94	ca 71	99	112	98	93	84	92	99	99	94	105	91	89	96	—	97	94
19	Distance between tips of proc. glenoidales (from middle of top to ditto of other side)	—	—	144	—	142	161	137	139	152	150	159	142	157	153	149	160	148	—	—	—
20	Distance from post. surface of occipital condyle to ditto of M^3 of corresponding side	—	256	256	254	259	258	261	280	274	281	255	259	255	249	264	258	245	236	—	—
21	Interval between lower edge of for. magnum and median posterior extremity of palate	328	296	—	—	296	314	319	311	289	ca 307	299	302	300	301	310	294	ca 303	337	337	317

[1]) See the note on table K.

TABLE K.

	Corresponding Nos. of Stremme (1911), p. 94.	Corresponding Nos. of Toula (1902) table.		Rhinoceros sivalensis (Baker & Durand) 1836, p. 502.	"Rhinoceros sivalensis" Stremme (1911) p. 90 & 94	Our own fossil specimens	
				A	α	a	b
1	—	1	Greatest length of cranium (from tip of nasals to posterior surface of occipital condyles)	—	598	645	ca 610
2	—	—	Greatest width of ditto (interval between outer surfaces of zygomatic arches)	—	—	360	391
3	4	3	Breadth between proc. postorbitales of frontals	254	194	199	198
4	13	2	Transverse width of nasals below vertex of nasal arch	174	95	111	119
5	—	6	Least distance between the cristae fronto-parietales	—	35	54	—
6	—	—	Perpendicular from a line tangential to the summit of occipital crest and vertex of nasal arch to the depression of frontals	99	—	67	—
7	2	14	Greatest breadth of occiput.	341	270	304	—
8	7	10	Interval between outer angles of occipital condyles	195	134	136	—
9	8	15	Horizontal diameter of for. magnum	—	48	46	—
10	1	—	Height of occiput (from lower edge of for. magnum to summit of occipital crest)	259	194	197	—
11	—	22	Interval between naso-maxillary notch and tip of nasals	—	152	145	ca 140
12	—	21	Interval between ditto and anterior border of orbit	—	108	119	ca 115
13	12	20	Distance from posterior surface of occipital condyle to anterior border of orbit of the corresponding side	449	383	398	ca 420
14[1])	5	—	Distance from anterior border of orbit to posterior border of meatus auditorius externus	—	—	323	—
15	14	—	Height of vertex of nasal arch above palate	238	152	154	ca 149
16	6	—	Total length of the seven molars	324	248	272	—
17	—	—	Length of premolar series (measured at the buccal side).	—	—	135	—
18	10	—	Distance between internal extremities of fossae glenoidales	—	86	94	ca 75
19	—	—	Distance between tips of proc. glenoidales (from middle of top to ditto of other side)	—	—	143	—
20	—	24	Distance from post. surface of occipital condyle to ditto of M^3 of corresponding side	—	245	255	267
21	11	42	Interval between lower edge of for. magnum and median posterior extremity of palate	368	283	—	—

RHINOCEROS SONDAICUS													Toula (1902) table	Cuvier (1822) p. 37	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
646	611	641	595	640	639	622	601	616	627	642	634	616	590	—	—
354	328	347	339	365	346	337	326	339	325	354	361	354	—	—	—
218	167	183	182	183	192	194	173	171	182	204	218	190	184	172	197
99	87	88	85	81	93	95	91	94	95	107	107	100	87	87	95
ca 42	55	67	50	56	69	63	47	46	37	60	62	52	70	—	—
59	53	47	60	48	60	59	61	61	57	65	60	58	—	—	—
306	281	275	296	289	299	289	291	289	276	302	310	320	271	294	303
153	142	130	142	139	144	134	123	145	132	149	145	144	130	145	132
50	42	46	45	50	50	48	43	45	45	44	49	45	46	43	42
226	204	212	205	226	212	231	205	210	213	229	222	219	—	196	218
160	152	159	150	159	157	149	144	153	161	163	151	151	160	—	—
117	100	110	97	106	108	103	109	102	102	102	112	102	117	—	—
398	374	393	373	400	401	406	369	376	385	400	404	383	390	390	385
306	309	330	291	326	323	322	302	304	316	304	328	320	—	—	—
ca 154	144	135	152	136	147	143	164	162	ca 137	160	148	163	—	—	—
250	254	247	—	245	243	257	239	241	266	247	256	250	—	248	—
125	133	122	—	125	119	130	126	125	132	128	126	128	—	—	—
99	105	96	87	84	92	100	91	88	101	91	90	92	—	95	90
141	151	135	130	152	150	161	131	148	147	149	162	142	—	—	—
258	241	256	261	274	282	259	239	240	240	264	261	235	230	—	—
295	294	313	290	289	ca 308	303	279	282	290	310	297	ca 290	ca 329	ca 329	305

[1]) As it is not improbable that Cuvier and Stremme measured from anterior border of orbit to anterior border or middle of meatus auditorius externus, I thought it better not to use the values given by them.

TABLE M.

Corresponding nos. of Stremme (1911), p. 94	Rhinoceros sivalensis	"Rhinoceros sivasondaicus"	Our own fossil specimens		Rhinoceros sondaicus														
	A	α	a	b	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
7:10 10	2 : 1	1.32	1.39	1.54	—	1.35	1.38	1.30	1.44	1.28	1.41	1.25	1.42	1.38	1.30	1.32	1.40	1.46	—	1.50	1.39
7:8 18	2 : 10	—	3.14	3.23	—	3.09	2.68	2.86	3.40	3.44	3.25	2.89	3.20	3.28	2.73	3.32	3.44	3.48	—	3.09	3.37
16:18	6 : 10	—	2.88	2.89	—	2.53	2.42	2.57	—	2.92	2.64	2.57	2.63	2.74	2.63	2.71	2.84	2.72	—	2.61	—
16:3	6 : 4	1.28	1.28	1.37	—	1.15	1.52	1.35	—	1.34	1.27	1.32	1.38	1.41	1.46	1.21	1.17	1.32	—	1.44	—
15:4	14 : 13	1.37	1.60	1.39	1.25	1.56	1.66	1.53	1.79	1.68	1.58	1.51	1.80	1.72	1.44	1.50	1.38	1.63	—	—	—
13:21	12 : 11	1.22	1.35	—	—	1.35	1.27	1.26	1.29	1.38	1.30	1.34	1.32	1.33	1.33	1.29	1.36	1.32	1.19	1.19	1.26

TABLE N.

	No. of cranium.	P^1 l	P^1 b	P^1 l/b	P^2 l	P^2 b	P^2 l/b	P^3 l	P^3 b	P^3 l/b	P^4 l	P^4 b	P^4 l/b	M^1 l	M^1 b	M^1 l/b	M^2 l	M^2 b	M^2 l/b	M^3 l	M^3 b	M^3 l/b	
Rhinoceros sondaicus	1	—	—	—	30	41	0.73	36	53	0.68	41	57	0.72	43	57	0.75	ca 47	57	0.82	55	51	1.08	left
		—	—	—	29	41	0.71	37	53	0.70	38	56	0.68	43	56	0.77	ca 46	56	0.82	ca 52	51	1.02	right
	2	21	23	0.91	31	43	0.72	37	54	0.69	41	56	0.73	41	57	0.72	44	57	0.77	ca 48	57	0.84	l.
		ca 21	23	0.91	31	44	0.70	37	54	0.69	42	58	0.72	42	57	0.74	45	58	0.78	49	50	0.98	r.
	3	ca 21	19	1.11	ca 28	41	0.68	ca 36	49	0.73	—	—	—	ca 45	58	0.78	45	58	0.78	46	53	0.87	l.
		ca 20	20	1.00	ca 27	41	0.66	ca 35	50	0.70	ca 40	54	0.74	41	58	0.71	ca 45	59	0.76	ca 44	50	0.88	r.
	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	ca 38	56	0.68	ca 43	44	0.98	l.
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	r.
	13	21	21	1.00	31	42	0.74	36	52	0.69	40	53	0.75	43	54	0.80	45	55	0.82	44	47	0.94	l.
		22	21	1.05	29	42	0.69	35	50	0.70	38	53	0.72	43	54	0.80	43	55	0.78	43	46	0.93	r.
	8	21	20	1.05	29	39	0.74	35	49	0.71	36	50	0.72	ca 38	50	0.76	39	51	0.76	—	42	—	l.
		—	—	—	30	38	0.79	33	49	0.67	37	50	0.74	ca 40	51	0.78	42	51	0.82	44	44	1.00	r.
	7	21	19	1.11	28	40	0.70	34	53	0.64	38	56	0.68	41	56	0.73	ca 46	59	0.78	46	51	0.90	l.
		ca 20	18	1.11	27	40	0.68	36	52	0.69	39	56	0.70	41	56	0.73	45	58	0.78	48	51	0.94	r.
	9	22	20	1.10	27	39	0.69	34	50	0.68	36	52	0.69	ca 41	54	0.76	43	54	0.80	ca 42	46	0.91	l.
		22	20	1.10	28	39	0.72	34	50	0.68	37	52	0.71	40	54	0.74	41	54	0.76	ca 44	45	0.98	r.
	5	ca 25	21	1.19	ca 28	40	0.70	ca 36	50	0.72	ca 40	56	0.71	ca 42	58	0.72	ca 42	58	0.72	ca 46	56	0.82	l.
		ca 24	21	1.14	ca 29	39	0.74	ca 35	50	0.70	ca 38	56	0.68	ca 40	58	0.69	ca 42	58	0.72	ca 45	54	0.83	r.
	6	20	19	1.05	28	41	0.68	33	56	0.59	40	58	0.69	41	57	0.72	46	59	0.78	65	52	1.25	l.
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	45	52	0.87	r.
	11	—	—	—	30	42	0.71	35	52	0.67	40	56	0.71	43	57	0.75	44	57	0.77	ca 43	49	0.88	l.
		—	—	—	30	41	0.73	37	52	0.71	40	56	0.71	43	58	0.74	44	58	0.76	ca 46	49	0.94	r.
	12	—	—	—	29	42	0.69	36	55	0.65	43	60	0.72	45	59	0.76	46	60	0.77	ca 48	52	0.92	l.
		—	—	—	30	42	0.71	37	55	0.67	43	60	0.72	45	60	0.75	46	60	0.77	ca 49	53	0.92	r.
	14	18	17	1.06	27	34	0.79	37	47	0.79	36	51	0.71	40	54	0.74	44	56	0.79	51	48	1.06	
Rhinoceros sondaicus"	α	20	24	0.83	28	40	0.70	36	52	0.69	38	51	0.75	39	56	0.70	45	56	0.80	52	49	1.06	
		21	28	0.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
		—	—	—	29	42	0.71	—	—	—	40	ca 56	0.71	41	58	0.71	45	61	0.74	51	52	0.98	l.
							0.75	37	52	0.71	40		0.69	40			47	62	0.71	50	53	0.94	r.

TABLE O.

	No. of cranium.	P^1 l	P^1 b	P^2 l	P^2 b	P^3 l	P^3 b	P^4 l	P^4 b	M^1 l	M^1 b	M^2 l	M^2 b	M^3 l	M^3 b	
Rhinoceros sondaicus.	1	—	—	0.73	0.72	0.88	0.93	1.00	1.00	1.05	1.00	ca 1.15	1.00	1.34	0.89	left
		—	—	0.76	0.73	0.97	0.95	1.00	1.00	1.13	1.00	ca 1.21	1.00	ca 1.37	0.91	right
	2	0.51	0.41	0.76	0.77	0.90	0.96	1.00	1.00	1.00	1.02	1.07	1.02	ca 1.17	1.02	l.
		ca 0.50	0.40	0.74	0.76	0.88	0.93	1.00	1.00	1.00	0.98	1.07	1.00	1.17	0.86	r.
	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	l.
		ca 0.50	0.37	ca 0.68	0.76	ca 0.88	0.93	1.00	1.00	1.03	1.07	ca 1.13	1.09	ca 1.10	0.93	r.
	13	0.53	0.40	0.78	0.79	0.90	0.98	1.00	1.00	1.08	1.02	1.13	1.04	1.10	0.89	l.
		0.58	0.40	0.76	0.79	0.92	0.94	1.00	1.00	1.13	1.02	1.13	1.04	1.13	0.87	r.
	8	0.58	0.40	0.81	0.78	0.97	0.98	1.00	1.00	ca 1.06	1.00	1.08	1.02	—	0.84	l.
		—	—	0.81	0.76	0.89	0.98	1.00	1.00	ca 1.08	1.02	1.14	1.02	1.19	0.88	r.
	7	0.55	0.34	0.74	0.71	0.89	0.95	1.00	1.00	1.08	1.00	ca 1.21	1.05	1.21	0.91	l.
		ca 0.51	0.32	0.69	0.71	0.92	0.93	1.00	1.00	1.05	1.00	1.15	1.04	1.23	0.91	r.
	9	0.61	0.38	0.75	0.75	0.94	0.96	1.00	1.00	ca 1.14	1.04	1.19	1.04	ca 1.17	0.88	l.
		0.59	0.38	0.76	0.75	0.92	0.96	1.00	1.00	1.08	1.04	1.11	1.04	ca 1.19	0.87	r.
	5	ca 0.63	0.38	ca 0.70	0.71	ca 0.90	0.89	1.00	1.00	ca 1.05	1.04	ca 1.05	1.04	ca 1.15	1.00	l.
		ca 0.63	0.38	ca 0.76	0.70	ca 0.92	0.89	1.00	1.00	ca 1.05	1.04	ca 1.11	1.04	ca 1.18	0.96	r.
	6	0.50	0.33	0.70	0.71	0.83	0.97	1.00	1.00	1.03	0.98	1.15	1.02	1.63	0.90	l.
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	r.
	11	—	—	0.75	0.75	0.88	0.93	1.00	1.00	1.08	1.02	1.10	1.02	ca 1.08	0.88	l.
		—	—	0.75	0.73	0.93	0.93	1.00	1.00	1.08	1.04	1.10	1.04	ca 1.15	0.88	r.
	12	—	—	0.67	0.70	0.84	0.92	1.00	1.00	1.05	0.98	1.07	1.00	ca 1.12	0.87	l.
		—	—	0.70	0.70	0.86	0.92	1.00	1.00	1.05	1.00	1.07	1.00	ca 1.14	0.88	r.
	14	0.50	0.33	0.75	0.67	1.03	0.92	1.00	1.00	1.11	1.06	1.22	1.10	1.42	0.94	
"Rhinoceros sivasondaicus".	α	0.53	0.47	0.74	0.79	0.95	1.02	1.00	1.00	1.03	1.10	1.18	1.10	1.37	0.96	
Our own fossil specimen.	a	—	—	0.75	0.75	—	—	1.00	1.00	1.03	1.04	1.13	1.09	1.28	0.93	l.
		0.55	0.38	0.75	ca 0.71	0.93	0.90	1.00	1.00	1.00	—	1.10	1.07	1.25	0.91	r.