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GEOLOGY
N. H.

THE

QUARTERLY JOURNAL

OF THE

GEOLOGICAL SOCIETY OF LONDON.

EDITED BY

THE ASSISTANT-SECRETARY OF THE GEOLOGICAL SOCIETY.

Quod si cui mortalium cordi et curæ sit non tantum inventis hæerere, atque iis uti, sed ad ulteriora penetrare; atque non disputando adversarium, sed opere naturam vincere; denique non belle et probabiliter opinari, sed certo et ostensive scire; tales, tanquam veri scientiarum filii, nobis (si videbitur) se adjungant — *Novum Organum, Prefatio.*

VOLUME THE TWENTY-SIXTH.

1870.

PART THE FIRST.

PROCEEDINGS OF THE GEOLOGICAL SOCIETY.

LONDON:

LONGMANS, GREEN, READER, AND DYER.

PARIS: FRIED. KLINCKSIECK, 11 RUE DE LILLE; F. SAVY, 24 RUE HAUTEFERRUILLE.
LEIPZIG: T. O. WEIGEL.

SOLD ALSO AT THE APARTMENTS OF THE SOCIETY.

MDCCCLXX.



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APRIL 27th, 1870.

Robert Logan Jack, Esq., of the Geological Survey of Scotland; George Alexander Lebour, Esq., of the Geological Survey of England and Wales; Coles Child, Esq., of the Palace, Bromley, S.E., and Harry Rivington, Esq., 22 Finsbury Square, N., were elected Fellows of the Society; and Prof. Joseph Szabo, of Pesth, was elected a Foreign Correspondent.

The following communications were read:—

1. *On the SPECIES of RHINOCEROS whose REMAINS were found in a FISSURE-CAVERN at ORESTON in 1816.* By GEORGE BUSK, F.R.S., F.G.S.

IN the year 1816, during the course of the quarrying of the limestone-rock at Oreston for the construction of the Plymouth Breakwater, a cavernous fissure was opened, containing numerous more or less fragmentary remains of *Rhinoceros*, but none of any other animal.

Notice of this discovery was given by Mr. Whidbey, the engineer of the works, to Sir Joseph Banks, at whose instance the bones were submitted to Sir Everard Home for examination, by whom a short paper on the subject was communicated to the Royal Society, which was published in the 'Philosophical Transactions' for 1817.

This paper contains little more than a mere enumeration of the bones and teeth, which are all assigned to *Rhinoceros*; and it was considered probable by Sir Everard Home that they belonged to three individuals.

In 1821 several other cavities in the limestone, of the same kind, were encountered, in one of which, amongst other mammalian remains, chiefly of Bear, a single tooth of *Rhinoceros* was met with, "lying apart from the rest;" this is described by Sir E. Home as the "fourth grinder from the front, right side, of the Single-horned Rhinoceros."

The above appear to have been the only Rhinocerine remains discovered at Oreston; for, although in 1823 a further set of caverns was laid open, whose contents have been ably described by Mr. Clift in the 'Philosophical Transactions' for 1824, nothing belonging to *Rhinoceros* was there found*.

The specimens enumerated by Sir E. Home are about twenty-two in number; but this cannot have included all that were sent by Mr. Whidbey, since the number of specimens assigned to the locality in the Catalogue of the Museum of the Royal College of Surgeons, where they are deposited, is thirty-eight or thirty-nine. They are numbered from 877 to 916. The tooth mentioned by Sir E. Home as having been found in the second cavern does not appear to be among them; and one of the numbered specimens (897) is not at present forthcoming.

As regards condition and colour, with one or two exceptions, the specimens have a very uniform aspect; and it is highly probable that Professor Owen is right in assigning them all to a single individual.

Sir E. Home imagined that the glenoid cavity of the scapula was too small in proportion to the head of the corresponding humerus, and that a detached olecranon belonged to a still smaller individual. But as regards the scapula in question, there does not appear to be any reason to concur in this suggestion; and as I have been unable to find the detached olecranon, I can offer no opinion respecting it. Most of the other epiphyses of the larger long bones are detached, which is in favour of the supposition that the ulna may have formed part of the same skeleton, of an individual which had not attained to full maturity.

It should be observed, however, on the point of age, that the complete union of the distal epiphysis of the humerus and of that of the metacarpals, and the much worn condition of the teeth, show that the animal must have reached pretty nearly its full stature; and if the rate of the development of the bones was the same as in the Elephant, it was probably somewhere about twenty years old. It must be confessed, however, that the teeth, for some reason, appear to be rather unduly worn for that age.

Sir Everard Home, as might be expected from the period at which he wrote, made no attempt to discriminate the species to which the remains belonged, unless we may interpret his expression respecting the tooth found in the second cavern as implying that he regarded them as belonging to *Rhinoceros unicornis*. Nor does Cuvier, when referring to Sir Everard Home's paper, make any remark on this point.

* In 'British Fossil Mammals' (p. 343), it is stated, with reference to the Rhinoceros-bones, that most of the parts recovered from this cavern were determined by Mr. Clift. But this does not appear to be the case. The remains described, and so beautifully figured by Mr. Clift, are those which occurred in the third set of caverns in the year 1823, and which, as above stated, did not afford any Rhinocerine remains. The bones forwarded to Sir Joseph Banks were "determined" by Sir Everard Home, and not by Mr. Clift.

In the 'Catalogue of Fossil Mammalia,' however, they are assigned to *Rhinoceros tichorhinus*; and Professor Owen, in 'British Fossil Mammals' (p. 343), notices and partially describes them under the head of that species, with which, in fact, they appear to have been associated by all palæontologists who have since had occasion to refer to them, with the exception of Dr. Falconer, who seems to have fully recognized the non-tichorhine character, at any rate, of the teeth. But he has left no remarks respecting the other bones*.

It nevertheless appears to me abundantly clear that neither the teeth nor the bones present any tichorhine character, but, on the contrary, that they are plainly referable to the widely different great southern form, *R. leptorhinus*, Cuv. (*R. megarhinus*, Christ.†).

The Oreston collection therefore acquires very great interest, not only as adding another to the as yet scanty instances of the occurrence of that species anywhere in Britain, but more especially as affording the only recorded example of its discovery in a cavern of any kind—a fact the more remarkable, perhaps, since no vestige of its remains has occurred in the Brixham cave, nor has as yet, I believe, been detected in Kent's Hole, where, more particularly, we might have expected to meet with an associate of the *Drepanodon*.

I will now proceed to state the proofs which appear to me calculated to support the conclusion at which I have arrived.

* It is only since my attention was lately directed to these remains, that I noticed a brief remark extracted from one of his note-books, and given in his invaluable 'Palæontographical Memoirs' (vol. ii. p. 353), which shows that his acute and practised eye had long ago (1859) discerned the distinction between the Oreston teeth and those of *R. tichorhinus*. His words are, "they are quite unlike *R. tichorhinus*; and I believe they agree with *R. hemitechus*."

Although unable, for reasons herein assigned, to agree with my lamented friend in the latter supposition, it was very satisfactory to find that my own opinion regarding the non-tichorhine relations of the teeth was supported by his eminent authority.

† It is to be hoped that the long-standing dispute about the proper appellation of this species, may now be considered finally settled. M. Christol's mistaken interpretation of the figures of Cortesi's skull has been fully explained and satisfactorily refuted. The identity, also, of that skull with the three so-called megarhine skulls that have at different times been disinterred near Montpellier has, as it seems to me, been completely established by the direct personal examination and comparison of them by Dr. Falconer; and it is, I believe, admitted by all, or nearly all, living palæontologists. The question therefore appears to require no further discussion. I would, however, take this opportunity of noticing a curious point connected with it, which seems to have been strangely overlooked by all who have written upon it except M. Duvernoy. It is nevertheless a point which, if properly considered, must long since have settled any dispute.

In 1854 M. Duvernoy pointed out the palpable fact that, supposing the Cortesi skull to have been furnished, as was imagined, with a septum, that septum, as shown in the figures where it was supposed to be represented, must have been placed precisely where it should not have been had the skull been that of *R. hemitechus*. In that species, as is well known, the septum terminates a few inches from the extremity of the nasals. Now this part is entirely wanting in the Cortesi cranium, in which the supposed remains of the septum are placed as far back as in *R. tichorhinus*. In fact, they retreat quite out of sight; and it is this circumstance probably that may have led M. Christol for some time to regard the skull as that of *R. tichorhinus*.

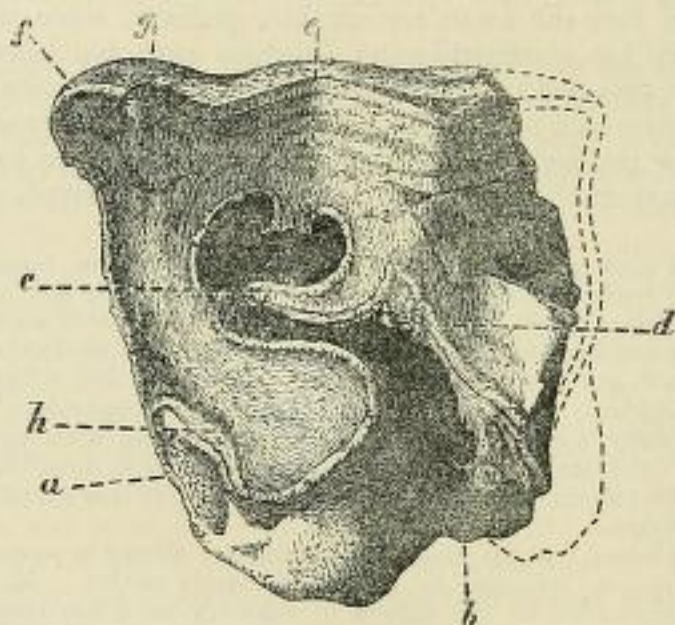
Most of the specimens are much broken, and consequently but ill fitted, more especially in the case of the genus *Rhinoceros*, for the determination of specific characters; but amongst them are several which will amply suffice for the purpose; and it is to these only therefore that I shall confine what I have to remark.

1. *The Teeth.*

The collection, as it exists in the College Museum, includes six molars—three maxillary, and three mandibular. Of the former, two, though much injured, are sufficiently perfect to afford good characters, the third is too imperfect to be of any use.

The most characteristic teeth are the two upper molars (numbered 877 and 878); and they are clearly the opposite teeth of the

Fig. 1.—*Left Upper Molar of Rhinoceros from Oreston.*

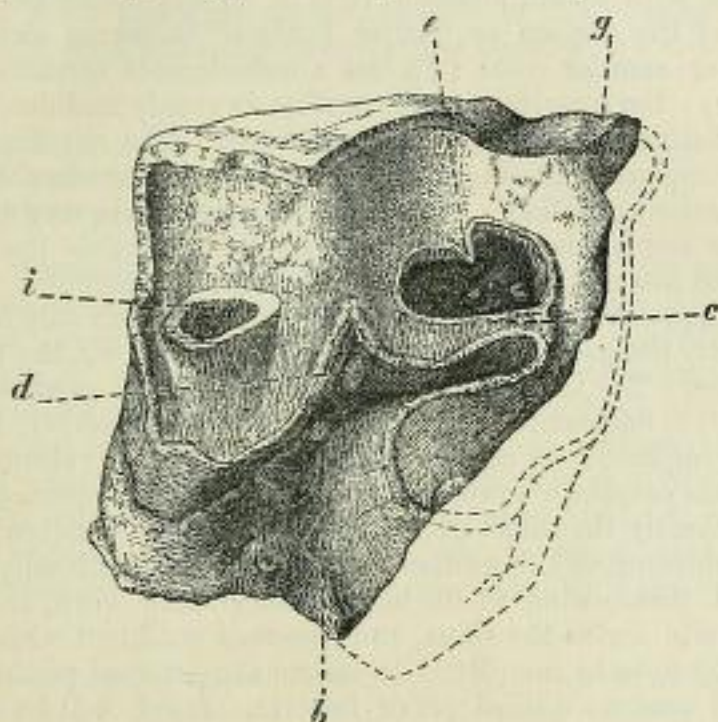


a. Anterior vallum or "guard." *b.* Entrance of median sinus ("anterior valley"). *c.* Uncus ("crochet"). *d.* Columella. *e.* Crista ("anterior combing-plate"). *f.* "First" ("anterior" or "angular") costa. *g.* Second costa. *h.* Anterior sinus.

same individual. As to their place in the series, opinions may very probably differ. In the Museum Catalogue they are described as the first molar (*m* 1); and Dr. Falconer, in the note above referred to, also appears to have assigned that position to them. I am myself, however, more inclined to regard them as the second molar (*m* 2), chiefly for the reason that the anterior outer angle is very acute, which shows that the tooth was oblique—and also because the anterior vallum is not prolonged in the form of a cingulum on the internal face of the anterior column, which it most usually is, but not always, in the *m* 1 of *R. leptorhinus*. And in all species of

Rhinoceros that tooth is usually much more rectangular than *m 2*. Moreover, on comparison, these teeth will, I think, be found to agree more closely with the *m 2*, of which a figure is given by Mr. W. Boyd Dawkins in his paper on the dentition of *R. leptorhinus*

Fig. 2.—*Right Upper Molar of Rhinoceros from Oreston.*



i. Remains of posterior sinus.
(Other letters the same as in Fig. 1.)

(*R. megarhinus*, B. D.) in the 'Natural History Review' (vol. v. p. 409), than with the *m 1* there represented. The point, however, is not one of any great importance.

Both the teeth, as before remarked, are much worn—the remaining height of the crown from the root of the fangs, measured on the dorsum, being about 2 inches. In the specimen, no. 878 (Fig. 1), which is of the left side, the anterior column is entire, and the remains of the very oblique and strongly developed anterior vallum or "guard," *a*, can be seen on its anterior face only, not encroaching at all upon the internal face. The entrance of the median sinus ("anterior valley"), *b*, presents two rather strong conical papillæ or cusps, whose points are slightly worn. The hinder part of the tooth, including the greater portion of the posterior column, is broken off. The uncus ("crochet"), *c*, is long, tapering, and curved outwards, so that its point is directed towards the anterior outer angle of the tooth. So far as it is worn down, and for a short distance beyond the worn surface, the uncus is free; but at a greater depth it is joined to the anterior column by a narrow isthmus, so

that at the bottom a portion of the sinus is isolated. The uncus arises from the posterior column at a very acute angle; but owing to its rapidly making a curve outwards, its general direction is nearly parallel with that of the column; and the short reentering angle is occupied by a slender columella, *d*, rising from the bottom of the sinus. A short crista ("anterior combing-plate"), *e*, projects into the sinus on its outer side, and in a line nearly vertical to the uncus, with which, however, it is in no way connected. What remains of the dorsum or "outer lamina" shows no elevation of the first or angular costa (*f*), but a considerable elevation of the second (*g*); the remainder of the surface is evenly undulated, without any distinct indication of a fourth costa. The anterior column is widely expanded at its inner end, with a rather deep sinuosity on its anterior aspect (*h*). The enamel throughout is very thin, and where the surface is exposed it is smooth. Towards the base of the dorsum there is a thin irregular coating of cementum.

In the opposite tooth, no. 877 (Fig. 2), we are fortunately furnished with exactly the parts that are wanting in no. 878, viz. the posterior column, &c. The tooth is so much worn that the posterior sinus ("valley") is represented merely by a small circular pit (*i*): it is consequently impossible to ascertain whether the hinder vallum ("third collis") was cuspidate or emarginate. In all other respects the tooth presents exactly the same characters as its opposite fellow, except that the entrance of the median sinus is furnished with only a single cusp, and that, owing to its being rather more worn, the uncus extends quite across the sinus, and becomes confluent with the anterior column, so as completely to isolate the external portion of the sinus, and produce a third pit or fossette. But it will be observed that this fossette is not formed in the same way as the peculiar "tichorhine pit" (that is, by the coalition, *ab initio*, of the uncus and crista), but simply, as not unfrequently occurs, by the prolongation at the base of the former, so that it reaches as far as the anterior column—a circumstance obviously of little moment as a character, since, as we here see, it may be said to exist on one side and not on the other. It may also be added that a similar prolongation of the uncus has been previously noticed in teeth of *R. leptorhinus*, an instance of which is afforded in pl. 51. fig. 4 of the 'Ossemens Fossiles,' which plainly represents, as it seems to me, a tooth of *R. leptorhinus*, and not of *R. hemitechus* as supposed by Prof. Owen. And a similar instance is shown in the tooth figured by Mr. W. B. Dawkins (*l. c.* p. 410, fig. 10), I believe, from Grays Thurrock. And it is important to remark the occasional possible occurrence of this peculiarity, since M. Christol, in his definition of *R. megarhinus*, expressly says, "le crochet de leur colline postérieure ne se joint jamais à l'antérieure" *.

* Dr. Falconer also (*op. cit.* ii. p. 336, pl. xviii. fig. 5) notices and figures a similar occurrence in a molar of *R. hemitechus*, and remarks:—"That this peculiar confluence of the crochet with the anterior barrel is abnormal in the true molars, is proved by the extreme rarity of the instances which have been observed of it in any species of *Rhinoceros*." He then cites Cuvier's figure, to

As regards dimensions, so far as they can be employed in the distinction of the quaternary species of Rhinoceros, little need be said. It may be broadly stated, at any rate, as regards *R. tichorhinus*, *R. leptorhinus*, and *R. hemiteochus*, that although the leptorhine teeth on the whole are the largest, the differences in this respect are so trifling, and the variations so considerable, that but little reliance can be placed upon deductions drawn from a single tooth; I shall therefore content myself in the present instance with simply giving the dimensions of the Oreston *m* 1 or *m* 2.

	in.
Length	2·3
Width at anterior column	2·5
Width at posterior column	2·0

These dimensions, or at any rate the two former, are exactly the same as in three instances recorded by Dr. Falconer, from Lyons, Nice, and Imola—although it is true they are less than in the general run of British specimens in the British Museum, in which the mean of the corresponding dimensions may be taken as $2·6 \times 2·5$.* But in partial explanation of this, it must be considered that, at the height to which the crown has been reduced in the Oreston specimens, they scarcely afford the full dimensions of the entire tooth.

Lower Teeth.—The two lower molars, to which alone I need refer, are nos. 880 and 881. The former (Fig. 3) is the crown por-

Fig. 3.—Crown of second Lower Molar of Rhinoceros from Oreston.

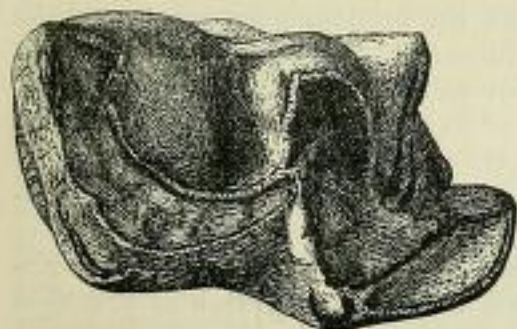
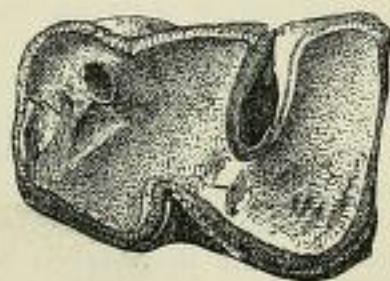


Fig. 4.—Fourth Lower Premolar of Rhinoceros from Oreston.



tion of *m* 2; and, with respect to it, all I would remark is, that the deep excavation of the worn surface, in consequence of which the

which I have adverted, and which he also assigns to *R. leptorhinus*, and further states that he is unacquainted with any other instance of what he terms "a bridge-crochet" in a true molar having been figured, "although," he says, "in the milk-molars it is by no means of rare occurrence." He also remarks that this appearance "must not be confounded with the cohesion between the 'crochet' and the 'combing' plate which gives rise to the third fossette, so characteristic of *R. tichorhinus*" (p. 33).

* It is, perhaps, not improbable that the Oreston teeth may be milk-molars.

points of the hinder horns of each crescent rise into acute eminences, shows a mode of usure totally different from that which is observed in *R. tichorhinus*. Moreover the enamel is far too thin and smooth for that species, nor does the anterior column exhibit on its inner face the distinct posterior costa which exists in the lower molars of *R. tichorhinus*. I am unable to point out any sufficient character by which this particular tooth could be distinguished from that of *R. hemitechus*. The size of the tooth is—

Length 2·1 inches.
Width.. 1·15 and 1·2.

No. 881 (Fig. 4) is so much worn as to be of very little use for the purpose of diagnosis. It appears, as stated in the 'Catalogue,' to be *pm* 4. That it is not tichorhine is obvious enough from the thinness of the enamel. But, except that it is, perhaps, rather more tapering in front, I do not see how it could be distinguished from the same tooth in *R. hemitechus* or *R. etruscus*.

These teeth, therefore, except as regards *R. tichorhinus*, are of no value for my present purpose. But with respect to the maxillary teeth, the following characters may be adduced as distinguishing them from those of the tichorhine Rhinoceros, and, in some measure, from those of any other species.

1. The thinness and smoothness of the enamel.
2. The configuration of the dorsal surface, as seen in—
 - (a) The lowness of the *first* and *fifth* costæ—that is to say, of the anterior and posterior angles.
 - (b) The even undulation of the posterior area, as it is termed by Mr. W. B. Dawkins, and the total absence of the fourth elevation counting from the front, or the fourth costa.
3. The expanded inner end and the pronounced sinuosity on the anterior aspect of the anterior column.
4. The great size of the anterior vallum.
5. The form and connexions of the uncus, and the consequent absence of the true "tichorhine pit."

From the corresponding tooth of *Rhinoceros hemitechus* the present seems to differ:—

1. In the lowness of the anterior costa, *c* 1, and consequent absence of the deep sulcus between it and the second or principal costa.
2. In the comparatively easy undulation of the rest of the dorsal surface.
3. In the thinness of the enamel and, it might be added, of the cementum—a character upon which, however, I think Dr. Falconer was disposed to lay rather undue weight.
4. In the form of the uncus—which, instead of being thick and rounded towards the point, is slender and attenuated, and instead of pointing directly forwards, as in *R. hemitechus*, is ultimately directed forwards and outwards*.

* Dr. Falconer, as every one knows, placed great reliance upon the angle formed between the uncus and posterior column in the discrimination of *R.*

5. In the direction of the crista, which, when present in *R. hemitachus*, arises further back from the outer lamina, or even from the base of the hinder column itself, and projects in a direction nearly parallel with the uncus, instead of at right angles to it.

2. Other Bones.

Most of the bones, as I have said, are in a very fragmentary condition; but amongst them are one or two which are capable of affording excellent characters, and are, in fact, alone sufficient, as it seems to me, to determine the species to which they belong.

The first of these is a right middle metacarpal, (no. 905 in the Catalogue). The bone is nearly perfect; and its growth is completed, inasmuch as no trace remains of the junction between the shaft and the epiphysis.

Regarded with respect either to its size or to its form and proportions, this bone differs so strikingly at first sight from the corresponding bone in any other species of Rhinoceros, recent or extinct, with which I am acquainted, that it is surprising its true specific relations should have been so long overlooked. First, as regards its *size*. In Table I. (in which the dimensions and proportions of the middle metacarpal, in several instances, of *R. leptorhinus* and *R. tichorhinus* are given), it will be seen that the Oreston bone is nearly $1\frac{1}{2}$ inch longer than the longest specimen of *R. tichorhinus* of which I have any knowledge, and, in the second place, that it nearly corresponds in length with the metacarpal of *R. leptorhinus*, as shown in two specimens from Grays Thurrock, in the British Museum*. As regards the other dimensions, it will also be seen considerably to exceed those of *R. tichorhinus*—as, for instance, in the size of the two extremities, and especially in the transverse diameter of the distal articular surface or trochlea, which may be regarded as affording a pretty certain term of comparison. With respect to the least circumference of the shaft, it is true that in one instance of *Rhinoceros tichorhinus* that has come under my observation, from the river-gravel at Stratford-on-Avon, the cir-

hemitachus from *R. leptorhinus*; and, in the main, I think he was quite right in so doing. But it must not, so far as I can judge, be supposed that this character affords an invariable criterion in all cases. Several instances, besides the present, showing this, may be cited from the figures given in the 'Paleontographical Memoirs' and elsewhere. For instance, in the lower jaw from Lyons, of which a figure is given in pl. xxxi. fig. 2, the crochet appears to rise very much in the same way as in the Oreston teeth, that is to say, at an acute angle, and then to curve outwards. Again, in Mr. B. Dawkins's fig. 10 (N. Hist. Rev. v. p. 410), the crochet cannot be said to arise at an open angle, but the reverse; and the same may be said of the milk-molar, fig. 4 (*l.c.* p. 405). I have also in my possession a *m* 3 from Ilford, belonging to Mr. Prestwich, in which the same may be observed; and, further, from this specimen it is apparent that as the tooth wore down, the angle would become more and more open; so that, without throwing any doubt upon the general usefulness of the form of the angle as a diagnostic character, it is, I think, one which requires to be used with caution.

* From the close similarity of these two metacarpals from Grays, it is not improbable they may be the right and left of the same individual.

cumference is greater; but this is owing to the circumstance that that bone appears to be one in which the muscular ridges on the hinder surface are very much developed, and the whole bone unusually thick. The Oreston bone is thus satisfactorily shown to be much larger in every way than that of *R. tichorhinus*.

But this is not all; it is not only much larger, but it differs still more remarkably in its proportions. These are also shown in the Table, in which the last two columns give the ratio, first, of the least circumference to the length of the bone, which I call the "perimetral index"—and, secondly, of the antero-posterior diameter of the shaft at the middle to its transverse diameter at the same point, which ratio I denominate the "latitudinal index." Inspection of the figures in these two columns will show at a glance how much slenderer, and how very much more compressed or flattened, is the metacarpal of *R. leptorhinus* as compared with that of *R. tichorhinus*.

I have not as yet met with the metacarpal of either *R. hemitechus* or *R. etruscus*; but as its dimensions, and in some measure, probably, its proportions may be pretty safely predicated from those of the corresponding metatarsal, I have subjoined a Table (II.) of the dimensions and proportions of that bone in the four known quaternary species.

From this it will be seen that in *R. leptorhinus* the middle metatarsal is about one-eighth shorter than the corresponding metacarpal, and in *R. tichorhinus* about one-twelfth. Assuming that the proportion between the two bones is the same in *R. hemitechus* and *R. etruscus*, it follows that the mean length of the metacarpal in those species would be from 7.4 to 7.6; and this is doubtless not far from the truth. It is clear, therefore, that, as regards length, the metacarpal of *R. leptorhinus* far exceeds that of either of the other three species; and, in fact, it is longer than in any species, living or extinct, except *R. unicornis*, and perhaps *R. simus*, of whose skeleton, however, we have no knowledge. Again it will also be perceived that although the "perimetral index" in *R. hemitechus* is very nearly the same as in *R. leptorhinus*, the "latitudinal index" is considerably higher, or in the proportion of, perhaps, 417 to 380. This shows how much flatter or more compressed the metacarpal of *R. leptorhinus* is than that of *R. hemitechus*, and, as will be seen in the Table, still more strikingly than that of *R. etruscus*, which, to judge from the metatarsal, must be by far the most cylindrical and at the same time the slenderest of all four.

From the above considerations, I think it impossible to avoid the conclusion that the Oreston metacarpal can only belong to *R. leptorhinus*.

The only other bone to which I need refer is that numbered 906. It is the distal extremity, quite perfect, of the right inner metatarsal, which measures 1.8×1.8 in antero-posterior and transverse dimensions. These dimensions, to judge from an entire bone in the British Museum, from Grays Thurrock (no. 23761), which measures 1.7×1.7 , would give the Oreston metatarsal a length of 7.41,

TABLE I.—*Middle Metacarpal.*

Species.	Place of Deposit.	Locality.	Length.	Least circumference.	Proximal end. ap.d. × tr.d.	Distal end. ap.d. × tr.d.	Shaft at middle. ap.d. × tr.d.	Trochlea. tr.d.	Perimetral index.	Latitudinal index.
R. leptorhinus.	No. 905 R. C. S.	Oreston.	9·2	5·4	22 × 24	20 × 28	9 × 22	2·50	·586	·409
	No. 25761 B. M.	Grays Thurrock.	8·8	5·5	21 × 25	20 × 29	9 × 24	2·40	·625	·375
	B. M. Oxford.	Grays Thurrock. Wirksworth.	8·7 7·8	5·5 5·25	20 × 25 × 25·6	20 × 28 × 26	9 × 24 11 × 19	2·40 2·25	·626 ·673	·375 ·578
R. tichorhinus.	B. M.	Kent's Hole.	6·8?	5·15	16 × 23	21 × 26	11 × 23	2·25	·757	·478
	B. M.	Amiens.	7·35	16 × 24	13 × 24	10 × 19	2·20	·526
		Stratford-on-Avon.	7·4	5·8	20 × 26	19 × 26	11 × 23	2·25	·783	·478
		Bengeworth.	7·0	4·9	20 × 25	17 × 23	9 × 20	2·00	·700	·450

TABLE II.—*Middle Metatarsal.*

R. leptorhinus.	No. 23761 B. M.	Grays Thurrock.	7·75	5·0	— × 24	19 × 29	9 × 21	2·3	·646	·428
	No. 19842, B. M.	"	8·0	5·2	— × 25	19 × 28	9 × 21	2·2	·650	·428
R. tichorhinus.	B. M.	Kent's Hole.	6·6	5·0	18 × 22	— × 22	10 × 20	2·0	·739	·500
R. hemitechus.	Brady Coll.	Ilford.	6·7	4·2	16 × 19	16 × 21	9 × 18	1·8	·631	·500
	"	"	6·3	...	16 × 20	14 × 20	× 17	1·85
	No. 20245. B. M.	"	6·8	4·4	18 × 20	16 × 22	9 × 18	1·9	·661	·500
	No. 20267. B. M.	Grays.	6·4	3·9	16 × 17	19 × 19?	8 × 16	1·7	·609	·500
	G. B.	Gibraltar.	6·6	4·2	15 × 17	15 × 21	8 × 18	1·85	·636	·432
R. etruscus.	B. M.	Val d'Arno.	6·9	3·9	15 × 19	18 × 20	9 × 16	1·7	·565	·563

NB.—In the 6th, 7th, and 8th columns, the figures represent tenth parts of an inch.

which very considerably exceeds that of the same bone in either *R. tichorhinus* or *R. hemitechus*, whilst it is quite in proportion with that of the metacarpal above described.

I have carefully surveyed the other bones in the Oreston Collection, but think it unnecessary to say more concerning them than that they seem to me to be all in accordance, as regards proportions, with the metacarpal and metatarsal, hoping that what I have ventured to remark concerning those bones and the teeth will be enough to establish the proposition with which I started.

DISCUSSION.

The CHAIRMAN remarked that at one time the Oreston *Rhinoceros* was referred to *R. tichorhinus*, but that Buckland, although mentioning the *Rhinoceros*, never gave it a specific name. The Chairman also said that the Oreston fissures were not caves, but mere fissures which had been filled in; an entire skeleton occurred at one spot, and the animal must have fallen in.

Mr. BOYD DAWKINS had been struck by the non-tichorhine character of the Oreston specimens some years since. He confirmed Prof. Busk's determination, and remarked that five British species of *Rhinoceros* are known, namely:—1. *R. Schleiermacheri*, from the Red Crag of Suffolk (in the Miocene at Darmstadt); 2. *R. etruscus*, from the Forest Bed = *R. Merckii* (Von Meyer); 3. *R. megarhinus* (Christol) = *R. leptorhinus* (Cuv.); but the latter name includes also *R. etruscus* and *R. hemitechus*; so that the adoption of De Christol's name gets rid of a difficulty; 4. *R. hemitechus*; and, 5. *R. tichorhinus* = *R. antiquitatis* (Blum.).

Prof. Busk, in reply, stated that Oreston was a fissure-cavern, and noticed the successive openings in 1816, 1821, and 1826. He did not agree with Mr. Boyd Dawkins in preferring the name *megarhinus* to Cuvier's *leptorhinus*. He did not know of the occurrence of two species of *Rhinoceros* at Oreston.

2. On TWO GNEISSOID SERIES in NOVA SCOTIA and NEW BRUNSWICK, supposed to be the EQUIVALENTS of the HURONIAN (CAMBRIAN) and LAURENTIAN. By HENRY YOULE HIND, Esq., M.A.

(Communicated by Professor Rainsay, F.R.S., F.G.S.)

[PLATE XXX.]

CONTENTS.

- I. Introduction.
- II. General Sketch of the Distribution of the supposed Huronian and Laurentian Series.
- III. Sequence of Formations. The Upper Silurian. The Lower Silurian, including the Gold-bearing Rocks.
- IV. The Cambrian, or Huronian Series.
- V. The Laurentian Series. The *Eozoon canadense* (?). Cape-Breton Island.
- VI. Relation of the Gold-districts to the Gneissic Areas.