

The following papers were read :—

1. Notice of the Discovery at Sarawak in Borneo of the Fossilized Teeth of Rhinoceros and of a Cervine Ruminant.  
By GEORGE BUSK, F.R.S.

As the existence of the Rhinoceros in the Island of Borneo is at present a matter of considerable doubt amongst zoologists, the discovery of remains belonging to that genus in the country of Sarawak is one of considerable interest in a zoological point of view. Palæontologically, also, the fact that these remains are in a fossilized or subfossilized condition and associated with the tooth of a probably extinct ruminant renders the discovery one of great interest, if only as affording encouragement to the attempt that it is to be hoped will shortly be made, under the auspices of Mr. Brooke, the present Rajah of Sarawak, to investigate the mammalian palæontology of that tropical region—an investigation which, if successfully carried out, cannot fail to afford results of the highest interest.

As regards the existence of a Rhinoceros in Borneo at the present time, the question must be regarded as quite an open one. In the opinion of some (amongst whom, I believe, I may cite Mr. Wallace), and certainly in that of Mr. Brooke, the existence of a Bornean Rhinoceros is by no means improbable, although perhaps limited to the northern parts of the island. It is certainly not now found in the Sarawak country; but the present specimens are amply sufficient to show that it existed there at some former period.

It should, moreover, be stated that some direct evidence, were it fully to be relied upon, has recently been afforded of the presence of *Rhinoceros sondaicus* in Borneo, in the shape of a very perfect and beautiful skull now in the British Museum, which was purchased as coming from that island; but as this testimony rests, so far as I am aware, solely upon the statement of a dealer, it may not be regarded as of much weight.

The evidence I have now to adduce of the former residence of a Rhinoceros in Sarawak is that afforded by two molar teeth, for an opportunity of exhibiting and describing which I am indebted to the kindness of Sir Charles Lyell, to whom they were sent by Mr. Brooke. In a letter to Sir Charles the Rajah states that, “although he has forgotten the exact locality in which the teeth were found, he is able to say positively that they were picked up in the Sarawak country, but whether in a cave or not does not appear.” As additional evidence of their *provenance* I may state that within the last few days Sir Charles Lyell has been informed by Signor Beccari that when he was at Sarawak he was shown some fossils, consisting of the neck-bone and tooth of a pachyderm, and, if he is not mistaken, two teeth of a ruminant, which were not found in a cavern, but in transported strata, formed by the decomposition of basalt, in the east of Sarawak, where the Chinese are working gold. It is highly probable, however, that Signor Beccari’s memory may have



failed him, and that the two teeth are those of the Rhinoceros, and the single one that of the Ruminant in question.

The Rhinoceros-teeth are the right and left second upper molars (*m.* 2), evidently belonging to the same individual. They consist only of the crown portions, which appear to be not fully developed at the base, and are wholly in the "germ" state, having no fangs and never having been protruded from the alveolus; they amply suffice, however, to afford distinctive characters. As regards the condition in which they are, the enamel and dentine, so far as the latter can be seen here and there, are extremely brittle and obviously contain but little animal matter. The surface is of a deep brown colour, and the subjacent substance has also a strong ferruginous tinge; it is also, as shown by experiment, strongly impregnated with iron. There is no dendritic appearance in any part. When wetted they exhale a remarkably strong peaty or earthy odour. These circumstances prove that they have lain for a long time in soil containing much iron and vegetable matter, and probably of a peaty nature. The hollows of the teeth, moreover, were partially filled with mould having the above characters. It may consequently be concluded from this, and from the entire absence of anything like the usual cave-earth, that the teeth had in all probability been lodged in a dried-up bog or peaty marsh, and not in a cavern—a conclusion which is in accordance with the statement of Signor Becari above cited. They must be regarded as fossilized in the same sense as the usual remains found in quaternary deposits of a similar kind, though it is impossible, in the absence of other data, to express any opinion as to the probable period they had been so imbedded.

Before proceeding to describe the morphological characters of the teeth, it will be as well to premise a few words in explanation of the terms employed.

The upper molars of Rhinoceros are of a more or less quadrilateral form, and are almost always rather wider in the transverse than in the longitudinal or antero-posterior direction. They present, therefore, four sides—an *external* or *dorsal* (the *dorsum*), an *internal*, an *anterior*, and a *posterior*. They may also be described as consisting of an external wide *lamina*, which forms the entire outer side of the tooth, and from which project obliquely, inwards and backwards, two transverse plates which, on the inner aspect, end in two conical or pyramidal columns or pillars. These columns and plates are separated from each other by a wide and deep valley, the median *sinus*; and in front of the anterior column, towards the inner part, there is in most cases a shallow valley, the *anterior sinus*, and behind the posterior column a much deeper one, the *posterior sinus*.

On the *dorsum* may be observed, besides the anterior and posterior margins, which are very usually more or less elevated, three vertical *elevations* or *costæ*, of which the anterior is always by far the most prominent.

On the anterior face the anterior sinus is crossed at the bottom by a prominent ridge, the *anterior vallum*; whilst the posterior sinus, on the opposite side of the tooth, is closed in behind by the

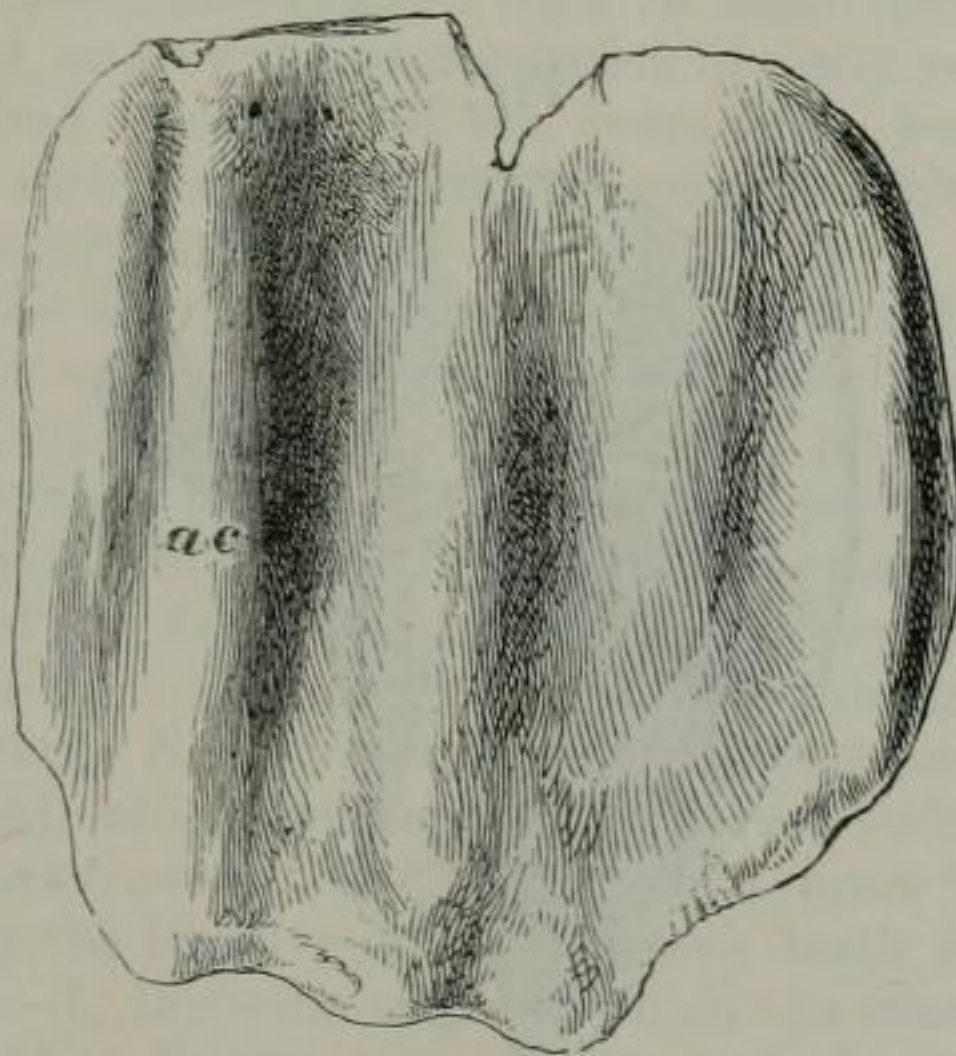


*posterior vallum*, which extends across from the posterior and external angle of the tooth to the side of the posterior column. This *vallum* is in some species deeply emarginate in the middle, and in others presents in the middle a *denticle* or small pointed cusp. On the *inner* face are seen the two pyramidal columns separated by the entrance of the median valley or *sinus*; and at the bottom of this entrance there is frequently a small tubercle, the *median tubercle*. Within the median sinus is seen projecting into it from the posterior column a process of enamel, which is usually termed the "*crochet*," and by some the "posterior combing-plate;" and in addition to this, in many cases, there are one or more small projections of the same kind, usually springing from the *outer lamina* into the *sinus*, which have been termed the "anterior combing-plate or plates." They might be conveniently designated as the *crista* or *cristæ*.

To describe the Sarawak teeth in the same order:—

1. On the *dorsum* the *anterior costa* (*a c*, fig. 1) is very prominent and prolonged to the base of the crown in its present immature condition. It is of considerable thickness. The second or median costa is very distinct and rounded; the third or posterior almost obsolete,

Fig. 1.



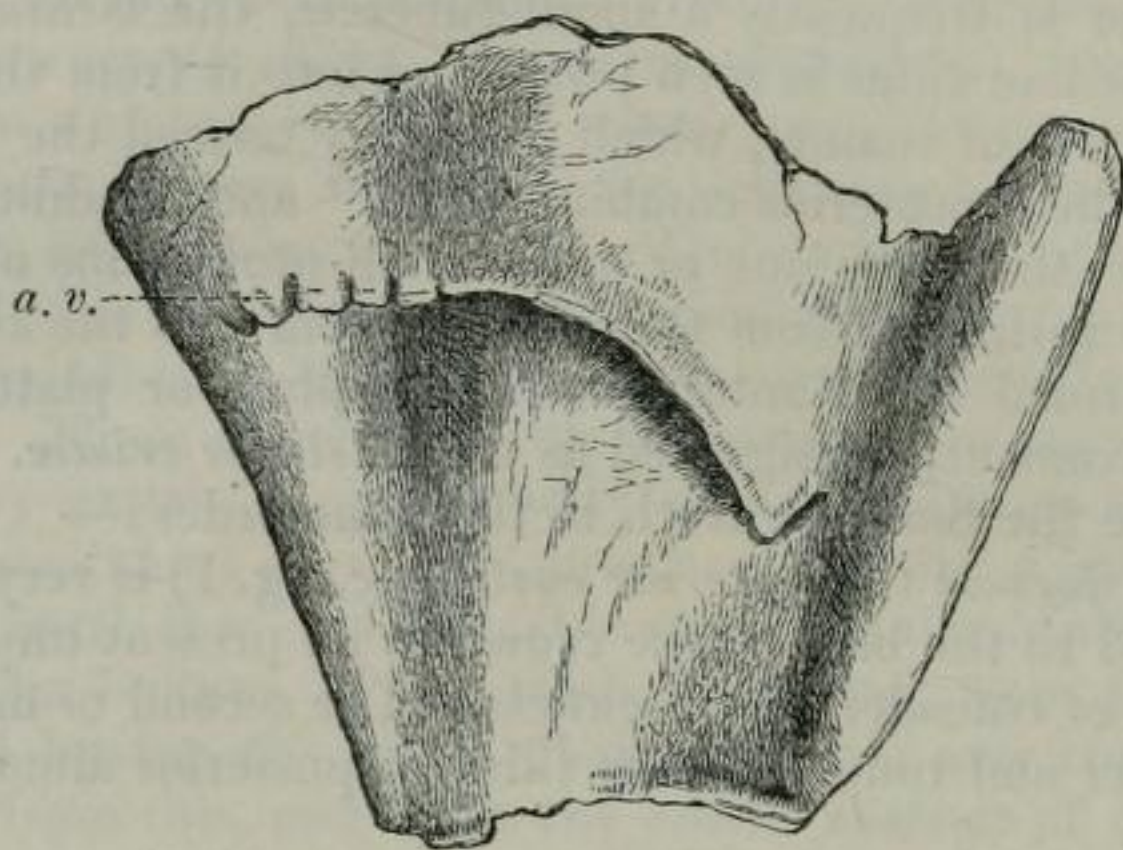
Dorsum of *m. 2*, Sarawak tooth.

being visible only towards the base and quite at the apex. The hinder border of the *dorsum* is much raised, so that between it and the *anterior costa* the surface of the tooth is deeply hollowed or concave. 2. The *anterior vallum* (*a. v.* fig. 2, p. 412) is strongly developed, and the *anterior sinus* deep, especially at the base. 3. The *posterior vallum* (*p. v.* fig. 3, p. 412) is deeply emarginate and presents no trace of a *denticle*, and its upper edge is even and not tuberculated. 4. On the *inner* face the entrance of the median sinus is contracted at the bottom and wide upwards, so that the columns, and especially



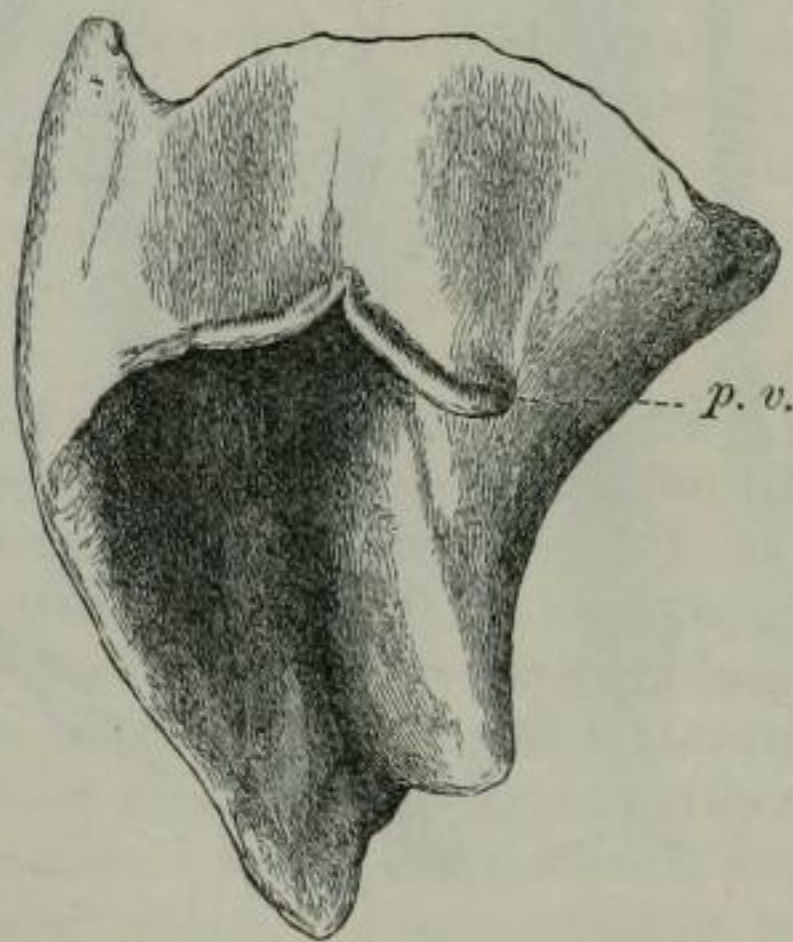
the posterior, are somewhat slender, and the latter is curved forwards towards the summit. There is a very minute *tubercle* at the bottom of the fissure. The *crochet* (*c*, fig. 4, p. 413) projects directly forwards, and rises from the hinder column at a very open angle. There is no trace of a *crista*.

Fig. 2.



Anterior surface.

Fig. 3.



Posterior surface.

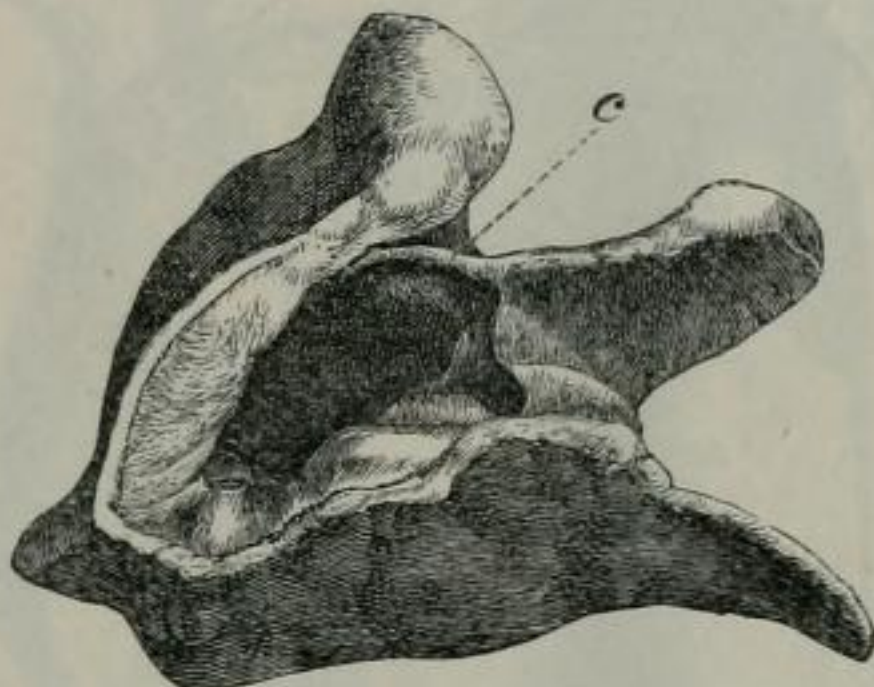
The question now is to determine the species, recent or extinct, to which these teeth belong. Although the evidence afforded by a single tooth, and that in a not fully developed condition, cannot be regarded as very ample or sufficient in many cases, still I think in the present it may be safely relied upon.

Without entering into other details, I may say that the dimensions of the tooth alone exclude from consideration, among existing species, *R. indicus*, *R. bicornis*, and *R. simus*, leaving of known species only *R. sondaicus* and *R. sumatranus*, and, amongst quater-



nary fossil or extinct forms, all except *R. etruscus*. All the other characters, moreover, would equally exclude these species; I shall, therefore, at present advert only to the latter three above named.

Fig. 4.



Crown surface.

1. If we regard the entire dentition of *Rhinoceros sondaicus*\*, it is of course at once distinguished from *R. sumatranus* by the size of the outer incisor, and by the conformation in many respects of nearly all the teeth, and especially of the premolars; but as we are now concerned only with the second upper molar, I will limit what I have to say to that tooth alone.

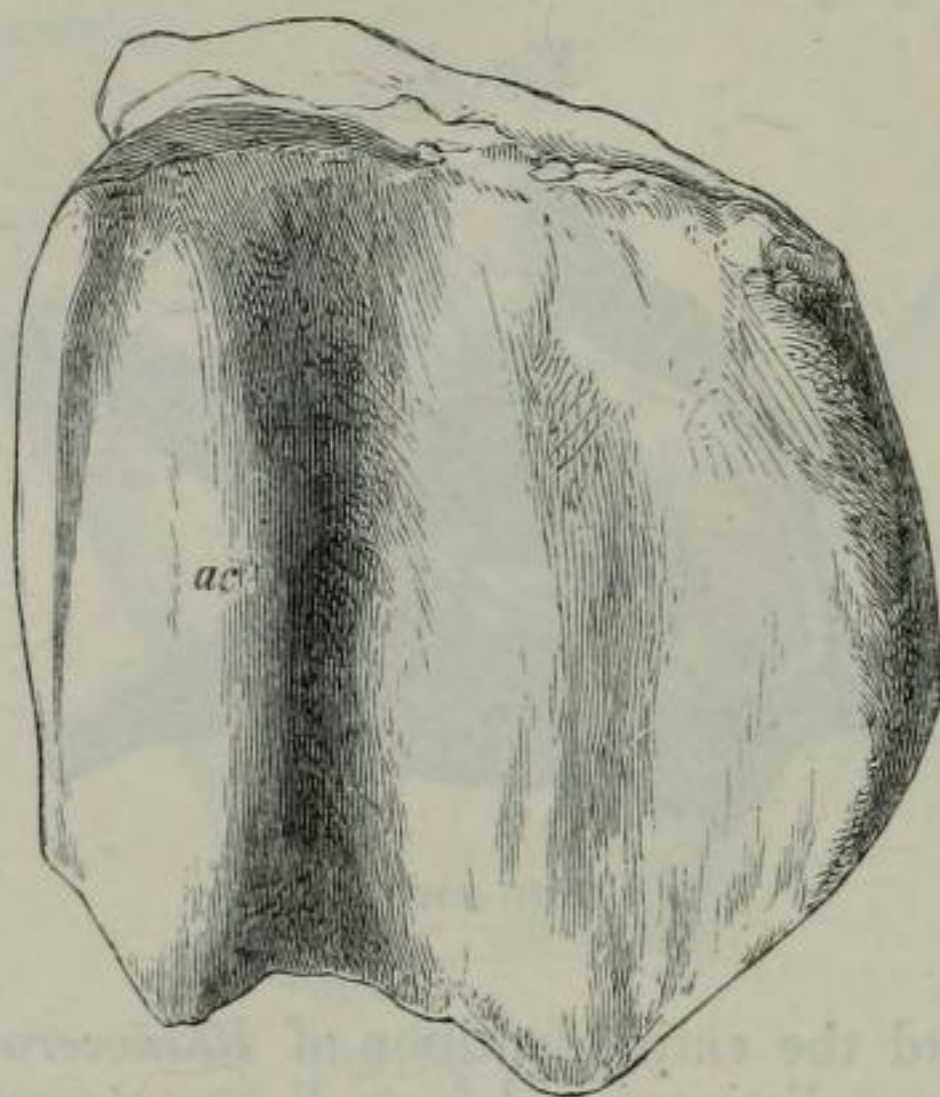
As regards the *dorsum* (fig. 5, p. 414), the resemblance between this surface in *R. sondaicus* and in the Sarawak tooth is obvious at first sight; the only difference, so far as I can perceive, is in the circumstance that the anterior costa (*a c*) is not prolonged quite to the base of the crown; but this, I think, may be explained by the immature condition of the Sarawak specimens. But by this surface alone it would not be easy, I conceive, or even possible, in some cases, to distinguish between *R. sondaicus* and *R. sumatranus*, as shown in figure 6 (p. 414), which represents the dorsal surface of the same tooth in *R. sumatranus*. The chief points upon which I should rely, as showing the identity of the Sarawak teeth with those of *R. sondaicus*, are:—1, the wide angle at which the crochet (*c*) is given off (fig. 7, p. 415); 2, the emargination and absence of a denticle on the *posterior vallum*; 3, the comparatively greater transverse as compared with the longitudinal diameter of the crown,—since in *R. sumatranus* the crochet springs at a right angle or even less from the hinder column (fig. 8, p. 415), and the posterior vallum, which has a more or less crenate edge, presents a very distinct and constant

\* Under this name I include *R. nasalis*, *R. stenorhynchus*, and *R. floweri* of Dr. Gray, not because I would venture at present to decide as to the true relations of these forms to each other, but because the dental characters at any rate, so far as I can perceive, afford no sufficient distinctions between them; and one thing appears abundantly clear, that, as contrasted with other well-marked species, they all constitute a group apart which I should myself regard as specific.



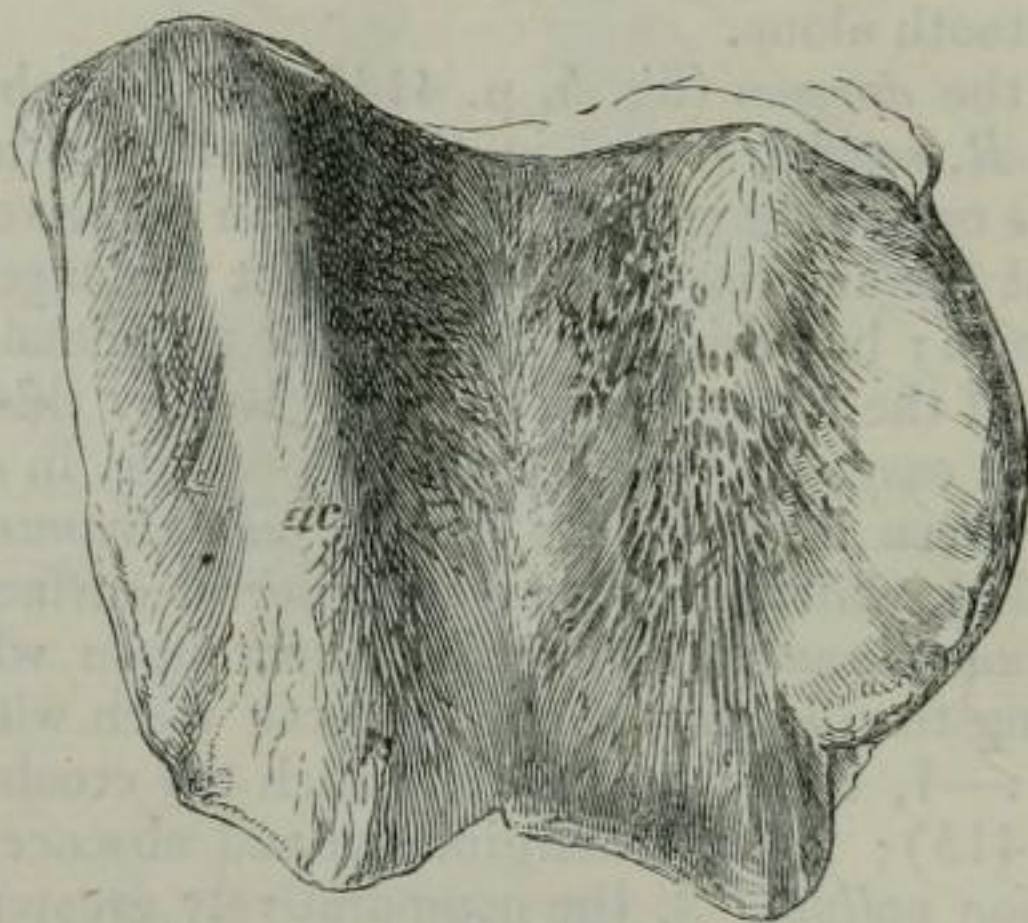
denticle, whilst the longitudinal exceeds the transverse diameter of the crown.

Fig. 5.



Dorsum of *m. 2*, *R. sondaicus*.

Fig. 6.



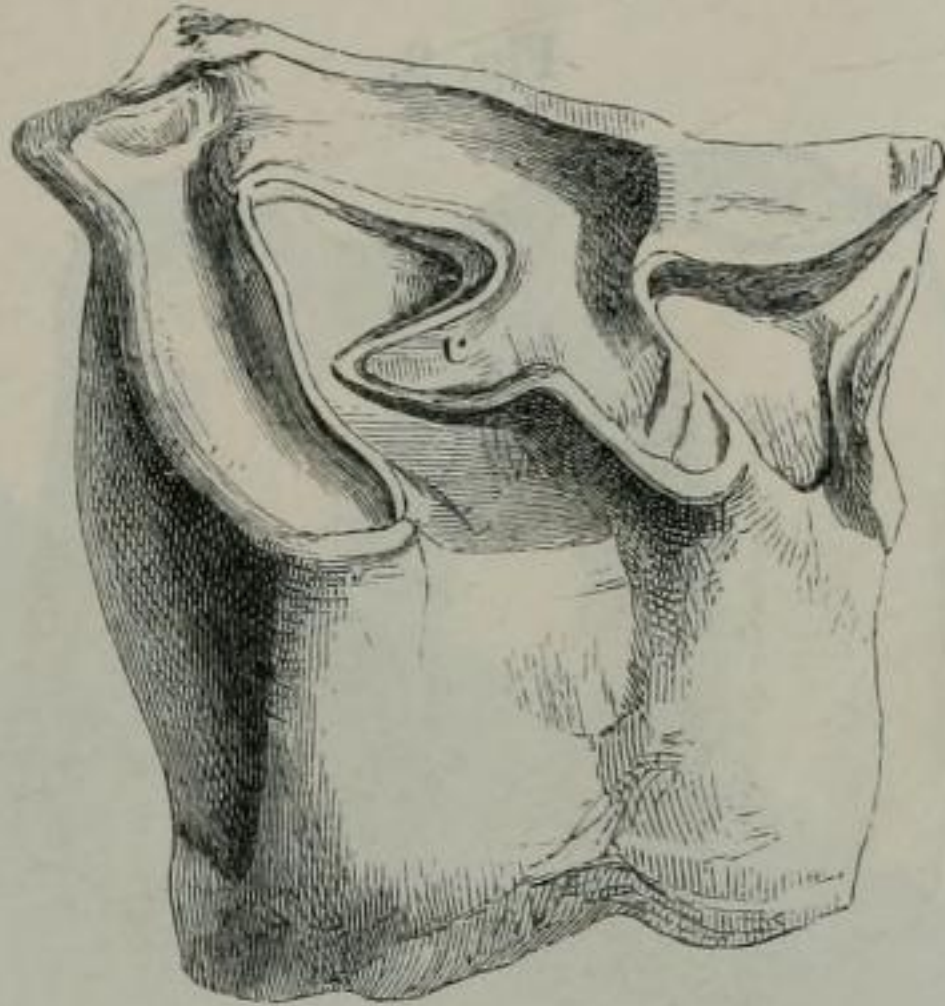
Dorsum of *m. 2*, *R. sumatranus*.

2. As regards *R. etruscus*, which, in the *crochet* and *posterior vallum*, exhibits the same characters as *R. sondaicus*, the distinction from the Sarawak fossils, and from the latter species, is to be sought (1) in the dorsal surface, in which the anterior costa is very little prominent, and much narrower or thinner than in *R. sondaicus*, and the hinder border is not at all raised, so that, instead of a concavity, the surface behind the anterior costa presents a convexity. The second or median costa also is much wider and more convex, and the third



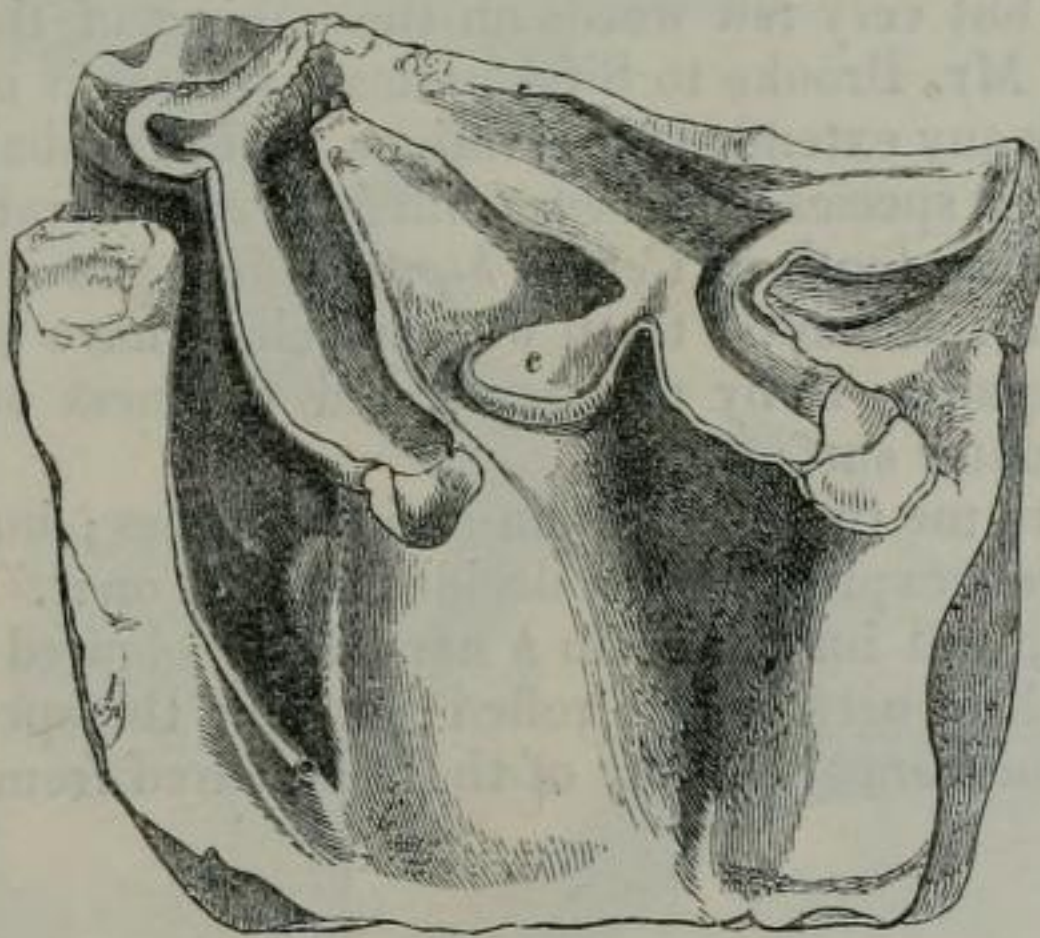
or posterior is continuous throughout the entire height of the crown (see fig. 9, p. 416).

Fig. 7.



Crown surface, *R. sondaicus*.

Fig. 8.



Crown surface, *R. sumatranus*.

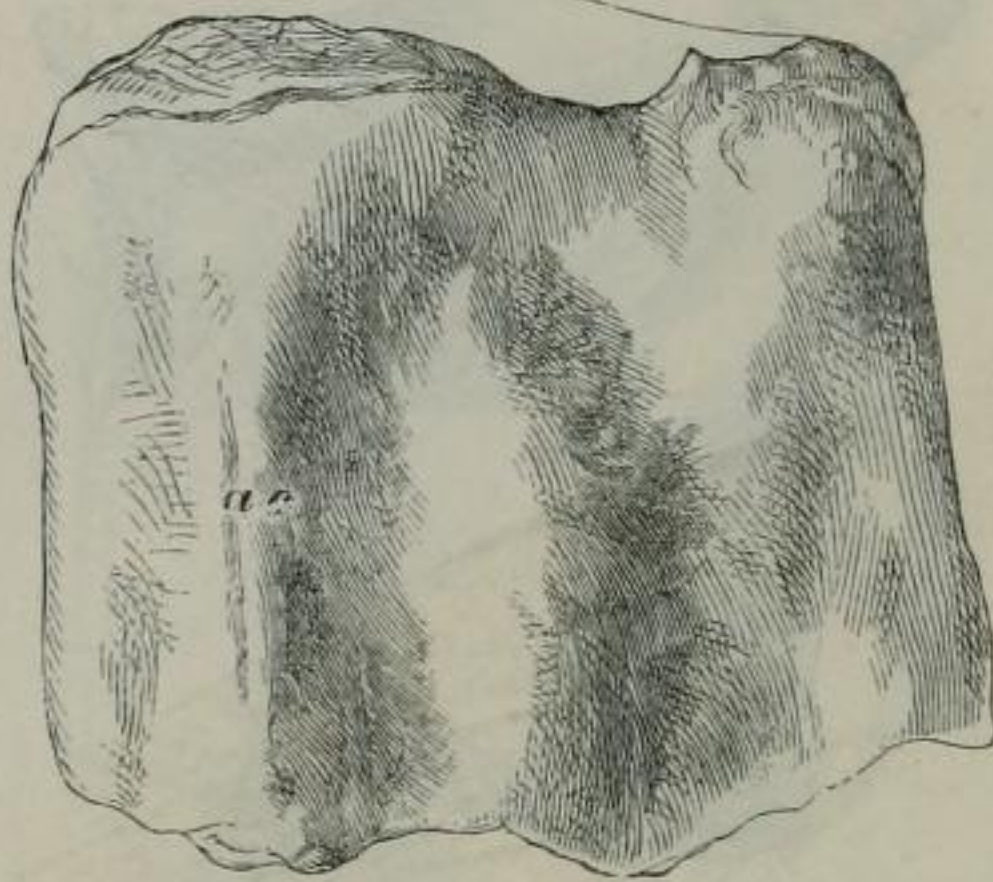
I consider, therefore, as regards the Sarawak teeth, that they belong to a species not distinguishable by its dental characters from *R. sondaicus*, and that that species formerly inhabited the country about Sarawak.

Before concluding, I would mention that Mr. Wallace has been good enough to place in my hands two upper molars, and, strangely enough, the two upper second molars of the same individual, and in the most beautiful and perfect condition, which he procured in Sumatra, but which present indubitably all the characters of the



tooth in question in *R. sondaicus*. That species, therefore, would seem to exist in Sumatra as well as in Java; but I am not aware that zoologists are acquainted with this fact.

Fig. 9.

Dorsum of *m. 2*, *R. etruscus*.

#### THE CERVINE TOOTH.

I shall say but very few words on the subject of the other fossil tooth sent by Mr. Brooke to Sir Charles Lyell, as it is scarcely in a state to justify any extended observations. It is probably the second upper molar of a species of *Cervus*; but it is considerably larger than the corresponding tooth of *Cervus hippelaphus*, and it is remarkable among all the ruminants' teeth with which I have had an opportunity of comparing it by the depth and wideness of the median sulcus in the outer surface.

It appears to me to belong to an extinct species; but at present I shall refrain from expressing any decided opinion on it. The fragment is much worn, and imbedded in a hard dark-coloured matrix which looks as if it had been much rolled; in fact the specimen bears a very close resemblance to many of those procured from the Crag.

2. Descriptions of six new Species of American Birds of the Families Tanagridæ, Dendrocolaptidæ, Formicariidæ, Tyrannidæ, and Scolopacidæ. By P. L. SCLATER, M.A., Ph.D., F.R.S., and OSBERT SALVIN, M.A., F.L.S.

(Plate XXVIII.)

1. CALLISTE FLORIDA, sp. nov. (Plate XXVIII.)

*Læte viridis; pileo et uropygio aurulento lavatis; interscapulio nigro variegato; alis nigris, secundariis et tectricibus omnibus*