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A Memoir on the living Asiatic Species of Rhinoceros.

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AMONG the investigations to which I devoted particular attention during my late rambles in Burmá, was the endeavour to corroborate and *confirm* the statement of Helfer and others, that the three known Asiatic species of rhinoceros inhabited that region. In this I succeeded, so far as the two insular species—*i. e.* the one-horned *Rhinoceros sondaicus* and the two-horned *R. sumatranus*—are concerned; for these prove to be the ordinary rhinoceroses of the Indo-Chinese region and continuous Malayan peninsula, and I have reason now to believe that they are the only rhinoceroses of that great range of territory, the huge *R. indicus*, so far as I can discover, appearing to be peculiar to the *tarai* region at the foot of the Himálayas and valley of the Bráhmaputra, or province of Asám; the rhinoceros still common in the eastern Sundarbáns, and also of the Ráj máhal hills in Bengal, where fast verging on extirpation, being identical with that of Jáva and Borneo, in the great oriental archipelago; while the Asiatic two-horned species, *R. sumatranus*, appears to be more common than the lesser one-horned, *R. sondaicus*, in the Indo-Chinese territories, this animal extending northwards to the Ya-ma-doung range of mountains which separates Arakan from Pegu, where Colonel Yule observed it as high as the latitude of Ramri island, and I have been assured by Major Ripley that one was killed not long ago in the vicinity of Sandoway. What the particular species may have been that was hunted by the Mogul Emperor Báber on the banks of the Indus cannot now be ascertained, unless, indeed, some bones of it may yet be recovered from the alluvium of that river: it is remarkable that he compares its bowels to those of a horse! A species is also stated by Dubalde to inhabit the province of Quang-si in China, in lat. 15°. This is much more likely to prove either *R. sondaicus* or *R. sumatranus* than the large *R. indicus*.

It is true that the late Dr. Theodore Cantor, in his 'Catalogue of the Mammalia of the Malayan Peninsula,' asserts that both *R. indicus* and *R. sondaicus* seem to be numerous there; but he does not mention that he had examined specimens, and he moreover notices that "a two-horned rhinoceros is stated by the Malays to inhabit, but rarely to leave, the densest jungle." As this animal is common in parts of Burmá, as well as in Sumátra, it may be confidently predicated to inhabit the intervening region of the Malayan peninsula;

but the more common and ordinary species of the peninsula would appear to be *R. sondaicus*; and a friend who has killed as many as nine individuals in the southern half of that region, to whom I showed several skulls of *R. indicus* and of *R. sondaicus*, is positive that all which he saw there were of the lesser one-horned species, as distinguished from the larger. The former, as before remarked, inhabits the islands of Jáva and Borneo in the archipelago, but not Sumátra;* whereas the two-horned species, as an insular animal, appears to be peculiar to Sumátra.† In the volume on elephants, &c., in Sir W. Jardine's 'Naturalist's Library,' the lesser one-horned rhinoceros is erroneously styled "the one-horned Sumátran rhinoceros," a mistake which might have been rectified by reference to Sir T. Stamford Raffles's paper in the thirteenth volume of the 'Transactions of the Linnean Society,' which indeed is cited by the compiler.‡

The vernacular tropical names of *Jávan* and *Sumátran* rhinoceroses had now better be disused, seeing that both species have an extensive range of distribution on the mainland of south-eastern Asia; the latter should rather be denominated "the Asiatic two-horned rhinoceros," and the two others "the great one-horned" and "the lesser one-horned," unless, indeed, the alleged discovery should be confirmed of the existence of a one-horned species in inter-tropical Africa, in addition to the four two-horned species which are now recognised upon that continent, in which case "the great Indian" and "the lesser Indian" might be deemed sufficiently appropriate, as the range of the "Asiatic two-horned" does not extend to India proper, which of course comprises Bengal but not Burmá. The existence of an African one-horned rhinoceros was long ago confirmed by James Bruce, of

* The range of *Bos sondaicus* is similar, excepting that this animal does not extend to Bengal, like *Rhinoceros sondaicus*.

† As also the Malayan tapir, the continental range of which extends northwards to the Tenasserim provinces of Tavoy and Mergui.

‡ The adult male rhinoceros which lived for many years in the Gardens of the Zoological Society, Regent's Park, London, and for which the considerable sum of £1000 was paid, is stated to have been captured in Arakan; but he was not nearly so large as several that I have since seen in India, and therefore I entertain an exceedingly strong suspicion that he was no other than *R. sondaicus*. His bones have doubtless been preserved. The two Asiatic one-horned species, indeed, resemble each other a great deal more nearly, in external appearance, than the published figures of them would lead us to suppose. Certainly no sportsman or ordinary observer would distinguish them apart, unless his attention had been specially called to the subject. The best figure I know of adult *R. indicus* is that published by Cuvier and Geoffroy, in the 'Menagerie du Museum d'Histoire Naturelle.'

Kinnaird, in addition to the two-horned species which he pretended to figure;* and Sir Andrew Smith assured me that he had been repeatedly told by natives that such an animal occurred in the regions northward of the tropic of Capricorn. In the 'Comptes Rendus,' tome xxvi. (1848), p. 281, an elaborate letter is published, "Sur l'Existence d'une espèce Unicorne de Rhinocéros dans la partie tropicale de l'Afrique," from M. F. Fresnel, then consul of France at Jidda (Djedda), to which the reader, curious on the subject, is referred.

Professor Schinz, in his 'Synopsis Mammalium,' makes out as many as eight living species of rhinoceros. The two Asiatic one-horned species, of course; and *R. sondaicus* only from Jáva; *R. sumatranus* from Sumátra only, and of this he remarks, "Cornu anterius mediocre, posterius minutum." His *R. niger* and his *R. Camperi* must alike be

* Bruce's figure of the Abyssinian rhinoceros, it is well known, is a reversed copy of Buffon's representation of true *R. indicus*, with a second horn added; Dr. Rüppell ascertained the species to be *R. africanus*, the ordinary black rhinoceros of South Africa. The earliest published *genuine* figure of this animal is that in the Supplement to Buffon's work; but certainly the most spirited as well as correct pictorial representations, alike of the rhinoceroses and of various other animals of Africa, are given by modern sporting travellers, as Cornwallis Harris, and especially C. J. Andersson. By a slip of the pen, the latter writer alludes to rhinoceroses in the island of Ceylon! As even Humboldt referred to the tiger of Ceylon in his 'Asie Centrale'! There are capital figures of some of the arctic animals, also, in Mr. J. Lamont's 'Seasons with the Sea Horses' (1861), among the rest, of the Spitzbergen deer, represented with well-developed vertical brow-plates to their horns. The question about the development of these deer, as compared with those of Lapland, is elucidated by Mr. Lamont, who states that "They do not grow to such a large size as the tame rein-deer of Lapland, nor are their horns quite so fine, but they attain to a most extraordinary degree of condition." For further details, see his extremely interesting volume. However, I may remark that in all his figures of rein-deer the brow-plate is represented as being well developed upon each horn, whereas I suspect that it is, generally, only rudimentary upon one of the pair; this, however, is probably a mistake on the part of the lithographer. In further reference to the article alluded to, in which I commented upon the late Professor Isidore St. Hilaire's remarks upon domestic animals, and contended that we do not owe the domestication of the turkey to the Spanish invaders of America, a most unlikely people to have accomplished anything of the kind, I may remark, that so completely familiar had this fowl become in Shakspeare's time that its then almost recent introduction into Europe had already been forgotten, for the great bard of Avon considerably ante-dates the existence of turkeys in England, making it prior to the Spanish discovery of the New World! In the first part of the drama of King Henry IV., Act ii. Scene 1, one of the carriers introduced exclaims, "'Odsbody! the turkeys in my panniers are quite starved." But it is not impossible that Shakspeare meant the guinea-fowl, albeit not very probable, though, in either case, he had ante-dated the appearance of the domestic bird in European countries.

referred to *R. africanus*. Next, *R. simus* and *R. keitloa*, but, of course, neither *R. Oswellii* nor *R. Crossii*. But what is his *R. cucullatus*, *Wagler*, unless an ill-stuffed *R. sumatranus*? “*R. cornubus duobus, capite sensim elevato, plicis cutis profundis* [!], *clypeo scapulari indiviso, supra latiori, epidermide verrucis parvis obsita. Capite elongato, auriculis subcylindricis, labro elongato prehensili, cauda mediocri. Hospitatur in museo Monacensi.*”

From examination of an extensive series of skulls of Asiatic rhinoceroses it is impossible not to discern that there are three well-marked species, each of which varies considerably in the shape of the cranium. Of each there is a shorter and broader type, higher at the occiput, wider anterior to the orbits; and also a type the opposite of this, with every intermediate gradation. This amount of variation in the existing Asiatic species of the genus should induce caution in the acceptance of *all* of the very numerous fossil forms that have been named by palæontologists.

R. sondaicus and *R. sumatranus* are very inadequately represented by the figures of skulls published by Cuvier and De Blainville. Those of both authors represent the narrow type, as distinguished from the broad type; whereas their figures of the skull of *R. indicus*, the *R. unicornis* of Linneus, represent an unusually fine broad example of the species, doubtless the skull of the individual figured from life in the ‘*Menagerie du Museum d’Histoire Naturelle*,’ which gives a far greater amount of contrast of appearance to the skulls of *R. indicus* and *R. sondaicus* than exists in average specimens of those of the two species.

The skulls of *R. indicus* and *R. sondaicus* appear to differ only, *constantly*, in the former being considerably larger, and having the condyle of the lower jaw proportionally much more elevated, imparting a conspicuously greater altitude to the vertex when the lower jaw is *in situ*. Both species would appear to exhibit precisely the same amount of variation. On present evidence, which, however, I suspect to be fallacious, it would seem that the broader type of *R. sondaicus* prevails in Bengal, and perhaps the narrower far southward; but we have both from the Tenasserim provinces, and they completely shade into each other, as equally in the analogous instances of *R. indicus* and *R. sumatranus*.

In illustration of the skulls, I cite the figures of Cuvier and De Blainville as exemplifying the broad-faced type of *R. indicus*, and a very similar skull is that upon the skeleton of a *female* in the Museum of the Calcutta Medical College. This female is one of a pair that

lived about forty-five years in captivity in Barrackpore Park. I have repeatedly seen the pair when alive, many years ago, and remarked that they showed no *secondary* sexual diversity, being exactly of the same size and general appearance. They never bred; and I have been informed that a pair of tapirs similarly kept for many years, in Batavia, showed no disposition to propagate their species. They should, of course, have been separated for a time now and then, and again put together. We learn from this Calcutta Medical College specimen and others, that the two forms of skull presented by the Asiatic species of rhinoceros are not indicative of sex, as might probably have been suspected.

So far as I can learn, the *R. sumatranus* is the only existing species of rhinoceros which presents secondary sexual distinctions; inasmuch as the horns of the male are very considerably more developed than those of the female. It further differs from the four existing African species of two-horned rhinoceros, not only by possessing slight skin-folds, but also by having the bases of the horns separated by a considerable interval: Bell's figure, in the 'Philosophical Transactions' for 1793, represents, as I believe, their full development in an adult female, as shown likewise in a Tenasserim stuffed head in the Society's Museum, already referred to; and over Bell's figure of the skull of a male are represented in outline the horns of an ordinary male, not quite so fine, however, as those upon Col. Fytche's specimen, and that officer informs me that he has possessed a head with still finer horns, some five or six inches longer. Unfortunately, fine horns of *R. sumatranus* are exceedingly difficult to procure, as they are eagerly bought up at high prices by the China men, who not only value them as medicines, but carve them into very elegant ornaments.* Still the horns which Dr. Salomon Müller figures, upon what he calls an adult male, are small; and when I was at Pahpoon, amid the forests of the Yunzalin district of Upper Martaban, in November last, an animal of this species was killed within five miles of me; but I did not learn of this in time, and was only able to procure the facial bones with the two horns. From their size and appearance I took them to be the horns of rather a juvenile male, but, on cleaning the bone, the

* The anterior horn of Colonel Fytche's specimen is worth, I was told, about fifty rupees, or £5. I have seen a pair beautifully carved and polished, and set with the bases upwards, in a black wooden frame similar to the stands on which Chinese metallic mirrors are mounted, and am sure *now* that they were the two horns of one individual of *R. sumatranus*, of about the same development as those upon Colonel Fytche's specimen.

nasals were found to be most completely and solidly anchylosed and united, and of the usual width in the male sex. The Karens obtained the animal by means of a heavy falling-stake, such as they set for tigers and other large game, and the carcass was completely hacked to pieces by them, and every edible portion of it devoured.

The Rev. Dr. Mason, in his work on 'The Natural Productions of Burmah,' remarks that the hide of the two-horned rhinoceros of that region is smooth like a buffalo's. This expression might mislead into the suspicion that the species is not exactly the same as that of Sumátra. Col. Fytche writes word, on this subject, "I have myself shot three rhinoceroses; one single-horned, on the borders of Asám,* and the other two not far from Bassein, in the Yomatoung range separating Pegu from Arakan. I saw the skin of the one whose skull you have got,† and it was exactly, in every respect, like the one I shot in Asám. The two-horned fellows I shot had smooth skins, as stated by Mason; they were, however, very thick, and there were slight rumples or folds about the neck and shoulders, I remember, but nothing to be compared in size to the mailed armour of the single-horned species." In Burmá, people distinguish only a one-horned kind and a two-horned kind; and though the skull from Tavoy Point referred to is very nearly adult and of fair size, Col. Fytche thought it to be that of a small and immature animal, as compared with the huge *R. indicus* that he killed in Asám. I must frankly confess that I have only quite recently discriminated the two one-horned species, fancying, as a matter of course, that the numerous skulls of single-horned rhinoceroses in the Society's Museum, from the Bengal Sundarbáns, &c., especially of the broad-faced type, were necessarily of the hitherto-reputed sole Indian species. F. Cuvier's figure of *R. sondaicus* is that of a very young animal, and, with those of Horsfield and S. Müller, conveys the appearance of a more evenly *tessellated* hide than I remember to have seen in any living continental example. I have, however, been comparing our stuffed Sundarbán example (less than half-grown) with the figure of adult *R. indicus* in the 'Menagerie du Muséum d'Histoire Naturelle,' and with the figures of *R. sondaicus* by S. Müller and others, and perceive that it must be referred to the latter and not to the former. The tubercles of the hide *are* much smaller than in *R. indicus*; and a marked difference between the two

* *R. indicus*, of course.

† That of *R. sondaicus*, of the narrow type, shot by my friend Dr. Hook, of Tavoy, near Tavoy Point, where there is a small isolated colony of the species.

species, as represented, consists in the great skin-fold *at the setting on of the head* of *R. indicus*, which is at most but indicated in *R. sondaicus*. In skulls of adults, however those of both species may vary in width, and especially in breadth anterior to the orbits, the following distinctions are trenchant:—Length of skull, from middle of occiput to tip of united nasals, measured by callipers, in *R. indicus* 2 ft. (half an inch more or less); in *R. sondaicus*, $1\frac{3}{4}$ ft. at most. Height of condyle of lower jaw, in *R. indicus* 1 ft., or even a trifle more; in *R. sondaicus* 9 in. Breadth of bony interspace between the tusks of the lower jaw, in *R. indicus* $1\frac{1}{2}$ in. to $1\frac{3}{4}$ in.; in *R. sondaicus* $\frac{3}{4}$ in. to 1 in. These measurements are taken from exceedingly fine examples of both species.

Sir T. Stamford Raffles asserts, of *R. sumatranus*, that “the female has a larger and heavier head than the male, but is similar in other respects.” (!) This decidedly does not apply to the two-horned species inhabiting Burmá, nor even to Bell’s figures of *Sumatran* individuals! Raffles further remarks that, “Dr. Bell’s description and representation of this animal are extremely correct. The skin of the Sumatran rhinoceros,” he adds, “is much softer and more flexible than that of the Indian one, and is not, like it, corrugated into plates of mail. It has, however, some doublings or folds, particularly about the neck, shoulders and haunches, rather more distinct and defined than in Dr. Bell’s drawing. The natives assert that a third horn is sometimes met with, and in one of the young specimens procured an indication of the kind was observed.” In Mr. C. J. Andersson’s ‘Lake Ngami’ the same is remarked of one or more of the ordinarily two-horned rhinoceroses of Africa. This traveller writes, “I have met with two persons who told me that they had killed rhinoceroses with three horns; but in all such cases, and they have been but few, the third or hindmost horn is so small as to be scarcely perceptible.” This seems a not unlikely character to have been developed more frequently in the great fossil *R. tichorhinus* of North Europe and Asia.

Bell further mentions, of *R. sumatranus*, that “The whole skin of the animal is rough, and covered very thinly with short black hair.” The latter is conspicuously represented in F. Cuvier’s portrait of the species in the ‘Planches des Mammifères,’ less so in Bell’s figure in the ‘Philosophical Transactions,’ and in that by Dr. Salomon Müller, and it is well shown about the *jowl* and base of the lower jaw of our stuffed skin of the head of an adult female. In Dr. S. Müller’s figure of what he styles an adult male, but the horns of which are

quite small, as in the adult Martaban example before noticed,* the shoulder-plait is rather more strongly developed, especially towards the elbow, than in the figures published by Bell and F. Cuvier,—F. Cuvier's figure representing a young male, and that by Bell a mature female, while the skull represented by Bell is that of a male with finer horns than appear to have been hitherto represented elsewhere.

Sir T. Stamford Raffles further remarks of the Asiatic two-horned rhinoceros, in Sumátra, that "They are not bold, and one of the largest size has been seen to run away from a single wild dog." We hear, however, of a "fire-eating rhinoceros" in Burmá, from its habit of attacking the night-fires of travellers, and scattering the burning embers and doing other mischief, being attracted by unusual noises, instead of fleeing from them as most wild animals do. Professor Oldham's camp was attacked in this way, in Tavoy province, and the animal being mortally wounded by a two-ounce ball, its skull was recovered three days afterwards, and proved to be that of *R. sumatranus*. The same propensity is ascribed to the ordinary black rhinoceros of South Africa (*R. africanus*): thus Dr. Mason cites, "This animal appears to be excited by the glow of a fire, towards which it rushes with fury, overcoming every obstacle. It has been known to rush with such rapidity upon a military party lodged among the bush covering the banks of the Great Fish River, that, before the men could be aroused, it had severely injured two of them, tossed about and broken several guns, and completely scattered the burning wood." I am not aware that the same ferocity has been remarked of either of the mailed one-horned species.

In Jáva *R. sondaicus* is reputed to be rather a mild animal, though I could cite a rumour of one attacking a sailor's watering party (Zool. 7328). According to Professor Reinhardt, this animal is, in Jáva, "found everywhere in the most elevated regions, and ascending, with an astonishing swiftness, even to the highest tops of the mountains." Dr. Horsfield also notices that "it prefers high situations, but is not limited to a particular region or climate, its range extending from the level of the ocean to the summits of mountains of considerable elevation. Its retreats are discovered by deeply-excavated passages, which it forms along the declivities of mountains and hills. I found these occasionally of great depth and extent." In Bengal, I believe that

* Can these animals, under any circumstances, occasionally shed and renew their horns, which consist only of a mass of agglutinated hair? There is certainly no physiological objection to the possibility of their doing so.—*E. B.*

the identical species is found in the Sundarbáns and also (formerly, at least) in the Rajmáhal Hills at all elevations; but it has hitherto been universally mistaken for *R. indicus*, a species which may inhabit the same localities,—only that now remains to be ascertained, as also if *R. sondaicus* extends its range to the region tenanted by the other. All evidence at present attainable points to the opposite conclusion.

So long ago as in 1838 the late Dr. Helfer remarked, that “The Tenasserim provinces seem to be a convenient place for this genus; for I dare to pronounce almost positively,” he then wrote, “that the three known Asiatic species occur within their range; *R. indicus* being found in the northern part of these provinces, in that high range bordering on Zimmay called the Elephant Tail Mountain; *R. sondaicus*, on the contrary, occupies the southernmost parts; while the two-horned *R. sumatranus* is to be found throughout the extent of the territories from the 17th to the 10th degree of latitude. In character *R. sondaicus* seems to be the mildest and can be easily domesticated, the powerful Indian rhinoceros is the shyest, and the double-horned is the wildest.” Mason remarked that “the common single-horned rhinoceros is very abundant. The double-horned is not uncommon in the southern provinces;” and then he alludes to the alleged “fire-eater” of the Burmans, supposing that to be *R. sondaicus* as distinguished from the common single-horned kind, which he thought was *R. indicus*. Very decidedly I consider that the alleged existence of the great sub-Himalayan *R. indicus* in Bengal, the Indo-Chinese region, and Malayan peninsula, remains to be proved; the broad and narrow types of skull of *R. sondaicus* having, I suspect, been mistaken for *R. indicus* and *R. sondaicus* respectively. That the real species denoted by these names was so early discriminated, I opine, is mainly due to the accident of *R. sondaicus* having been first obtained in Jáva, which induced the suspicion of its being probably different from the only then recognised continental species inhabiting Upper India; likewise to the accident of the Paris Museum containing a particularly fine skull of the true *R. indicus*, which, as before remarked, is probably that of the individual figured in the ‘*Menagerie du Museum d’Histoire Naturelle*.’

The Museum of the Calcutta Medical College contains, as we have seen, three noble skulls of *R. indicus*, besides that with the entire skeleton of an old female, both the broad and narrow types of skull being represented, but it has neither *R. sondaicus* nor *R. sumatranus*. The Society’s Museum still wants the first species, but is tolerably well supplied with the two others. Sir T. H. Maddock, in 1842, pre-

sented us with two skulls of *R. sondaicus*, of the broad and the narrow types, and also with two of *R. sumatranus*, one wanting the lower jaw, all from the Tenasserim provinces ; and the skulls of an old male and of an adult female of *R. sumatranus*,—the skin of the head of the latter, its axis vertebra, the long bones of the limbs (*minus* the right fore limb and scapula), and the two scapulæ and long bones of the four limbs of the male,—were presented to the Society by Mr. E. O'Reilly, then of Amherst, in 1847. In the 'Asiatic Researches' part of the head of a two-horned rhinoceros is recorded to have been presented, and also the horn of a rhinoceros from Sumátra. The latter was not in the Museum when I took charge of it in 1841, but the former I think I recognise in a pair of united nasal bones, certainly belonging to this species, and in this case the specimen would probably be from a Sumatran individual. Of *R. sondaicus* we have also a fine series of skulls, one of them from Jáva, presented by the Batavian Society ; the almost complete skeleton of a very nearly full-grown female, being considerably smaller than that of the female *R. indicus* in the Medical College Museum, and the small stuffed specimen to which I have before referred, the limb-bones of the skeleton being considerably more robust than those of *R. sumatranus*. For this skeleton, and those of elephant and camel, we are indebted to a former Náwâb Názim of Bengal, and it is doubtless either from Rajmáhal or the Sundarbáns, the skull being of the broad type, though less strongly marked than some others,—in fact intermediate, though scarcely quite midway intermediate.

The following notice, by Sir T. Stamford Raffles, may be advantageously introduced here:—"The one-horned rhinoceros of India is not known to the natives of this part of Sumátra ; and the single horns, which are occasionally procured, appear to be merely the longer horns of the two-horned species separated from the smaller one. There is, however, another animal in the forests of Sumátra never yet noticed, which, in size and character, nearly resembles the rhinoceros, and which is said to bear a single horn. This animal is distinguished by having a narrow whitish belt encircling the body, and is known to the natives of the interior by the name of Tenu. It has been seen at several places, and the descriptions given of it by people, quite unconnected with each other, coincide so nearly, that no doubt can be entertained of the existence of such an animal. It is said to resemble in some particulars the buffalo, and in others the badak or rhinoceros. A specimen has not yet been procured, but I have several persons on

the look out, and have little doubt of soon being able to forward a more accurate description from actual examination.

“It should be remarked,” continues Raffles, “that the native name, Tenu, has until lately been understood to belong to the tapir. It is so applied at Malacca, and by some of the people of Bencoolen. In the interior, however, where the animals are best known, the white-banded rhinoceros is called ‘Tenu,’ and the tapir ‘Gindol,’ and by some ‘Babi Alu.’ It is not impossible that, as both animals have white bands, the names may have been confounded by people little in the habit of seeing either, and deriving their information solely from report. In a country like Sumátra, where the inhabitants, in a great measure shut out from general communication, are divided into an infinity of tribes, speaking different dialects, a perfect consistency or uniformity of nomenclature cannot be expected, and it is not always easy to reconcile the synonymy.”

It naturally occurs to the mind that if the tenu really exists it would long ere this have been discovered, in all probability, in the neighbouring Malayan peninsula; but how little is even now known of the great animals inhabiting that peninsula! The late Dr. Cantor, when he wrote his ‘Catalogue of the Vertebrated Animals of the Malayan Peninsula,’ was unaware of the existence there of *Bos sondaicus* in addition to *B. gaurus*, only includes a two-horned rhinoceros on the testimony of the Malays; and whether *Elephas sumatranus* occurs on the mainland of Asia, like the tapir and the two insular species of rhinoceros, the *Bos sondaicus* and others, is still undetermined. It is possible enough, though doubtless rather improbable, that such an animal as the tenu may have escaped observation there even to this time. But it might not extend its range into the peninsula (as in the instance of the large Siamang gibbon, which is peculiar to Sumátra); and not very much has been accomplished in the investigation of the Zoology of the great island of Sumátra since the time of Raffles. At all events, I think the present opportunity a meet one to recall the subject to notice.

Baron Cuvier long ago remarked, I think in his ‘*Leçons dans l’Anatomie Comparée*,’ that even then it was not probable that any more existing large quadrupeds remained to be discovered; and it is worthy of notice that no remarkable genus of large quadruped has been since brought to light, though additional species have been discriminated of several of the old genera. The small Hippopotamus *liberiensis* of the late Dr. Morton is scarcely an exception, although since raised to generic rank by Dr. Leidy, by the name of *Chœropsis*.

Of the three genera containing the most bulky of existing land quadrupeds additional species have been distinguished, though, for the most part, they may not yet be universally accepted. Of *Elephas*, the *E. sumatranus* of Temminck and Schlegel, to which Sir J. Emerson Tennent refers the Ceylon elephant;* of *Rhinoceros*, a second black African species, the *R. keitloa* of A. Smith, long previously indicated by Sir J. Barrow by the name "Jekloa," and a second white African rhinoceros, the *R. Oswellii* of Elliot, besides the *R. Crossii* of Gray (founded on the horn only, and the habitat of which is unknown); and of *Hippopotamus*, the species of North and South Africa respectively are distinguished by Dr. Leidy and others (sinking *H. senegalensis* of authors, as a synonym of the former), and there is also the *Hippopotamus* or *Chæropsis liberiensis*, which is a most undoubted species, considered, as we have seen, entitled to generic rank by Dr. Leidy. Whether external differences exist between the great Hippopotami of North and South Africa remains to be shown; as also in the case of the European and American beavers, which Owen separated on account of differences in the configuration of the skull: in another animal first so discriminated, the *Phascolomys latifrons* of Owen, good external distinctions have since been discovered, which characterize it well apart from *P. wombat*. Of other *Pachydermata* of

* The grinders of *Elephas sumatranus* are said to be intermediate in form to those of the Indian and African species; and I have just purchased a pair of table-weights, formed each of a thick horizontal section of an elephant's molar tooth, which seems to me to be of this species. The little boxes formed of sections of elephant's molars, which are commonly brought from Galle, are, so far as I have seen, of the Indian species; but these are not necessarily from Cinghalese individuals. It is worthy of remark, however, that whilst among the elephants of Sumátra and Borneo fine *tuskers* would appear to be common, and the ivory is an article of export from both islands, as I am assured by a gentleman who has collected the article in Borneo, they are exceedingly rare among the elephants of Ceylon, where, nevertheless, it has been suggested that tuskers are so much sought after that they are seldom permitted to develop their ivories. With reference to Sir J. E. Tennent's speculation regarding the former continuity of land between Sumátra and Ceylon and Africa, of which the intermediate character of *Elephas sumatranus* is one of his presumptive proofs, it may be remarked that the *two-horned* *Rhinoceros sumatranus*, with its only slight skin-folds, interposes a link between the two-horned and smooth-skinned African and the single-horned and mail-clad Asian species; but, not to allude further to the alleged existence of a single-horned African species, the presence of the second horn in *R. sumatranus* is much less remarkable when we bear in mind the several fossil two-horned species of Europe and Asia, to which, moreover, the existing two-horned Asiatic rhinoceros is much more nearly akin than it is to the different African two-horned species, as before remarked.

Cuvier, more Equi, of the asinine type, have been added to the list, and several species of swine. Among the bovine ruminants the three species of flat-horned taurine cattle proper to south-eastern Asia have only recently been properly distinguished; also the *Bubalus brachyceros* of intertropical Africa; and there are others, as I believe, not yet sufficiently established, and more species also of large deer and antelopes. Among the Carnivora, no animal worthy of much note, unless Phocidæ (as might have been expected), and the like with Cetacea, my *Balænoptera indica*, for example, which is perhaps the largest of existing animals, but these latter are not four-limbed. Among the Quadrumana, the grandest of all, the huge gorilla, has been recently re-discovered, for its reputed existence was regarded as fabulous by Baron Cuvier. Lastly, in the bird class, it is most remarkable that the number of brevipennate species has quite recently been more than quadrupled; * still, however, no remarkable new genus, excepting the New Zealand moa, and of this at least two species have just been discovered to maintain a lingering existence, as I have learned from a letter recently received from Mr. E. L. Layard, who is at present in New Zealand as private secretary to Governor Sir G. Grey. One of these, of comparatively small size (about $3\frac{1}{2}$ feet high), has actually been killed and eaten by a famishing party of explorers, and fifteen others seen. Of the other, one of the large moas, only the fresh foot-steps, fifteen inches long, have been traced, as Mr. Layard states, by a party who had lost themselves; and therefore the instance does not appear to be the same as that lately recorded in the 'Zoologist' (Zool. 7847). Both of these living species inhabit the little-explored Middle Island.

EDWARD BLYTH.

Calcutta, March 1, 1862.

A further Note on Elephants and Rhinoceroses.—There is a notice of the wild elephants of Borneo in Mr. Spencer St. John's 'Life in the Forests of the far East' (1862), vol. i. p. 95. This author writes, "Among our Malays was one who had frequently traded with the north-east coast of Borneo, and the mention of 'gading' (ivory) brought to his recollection that elephants exist in the districts about the river Kina Batangan. I have seen many tusks brought to Labuan for sale,

* Even a *sixth* cassowary has since been added by the Baron von Rosenberg, of Amboyna. It is from the island of Salawatti, and has *no wattles*, as in all the others. He terms it *Casuarus Kaupi*. The *Balæniceps Rex* must be considered as a remarkable discovery among large birds; and this is quite a new genus.

but never measured one longer than six feet two inches, including the part set in the head. I have met dozens of men who have seen the elephant there, but my own experience has been limited to finding their traces near the sea-beach. It is generally believed that about a hundred years ago the East India Company sent to the Sultan of Sulu a present of these animals; that the Sultan said these great creatures would certainly eat up the whole produce of his little island, and asked the donors to land them at Cape Unsang, on the north-east coast of Borneo, where his people would take care of them. But it is contrary to their nature to take care of any animal that requires much trouble, so the elephants sought their own food in the woods, and soon became wild. Hundreds now wander about, and constantly break into the plantations, doing much damage; but the natives sally out with huge flaming torches, and drive the startled beasts back to the woods. The ivory of Bornean commerce is generally produced from the dead bodies found in the forests, but there is now living one man who derives a profitable trade in fresh ivory. He sallies out on dark nights, with simply a waist-cloth and a short sharp spear: he crawls up to a herd of elephants, and, selecting a large one, drives his spear into the animal's belly. In a moment the whole herd is on the move, frightened by the bellowing of their wounded companion, who rushes to and fro, until the panic spreads, and they tear headlong through the jungle, crushing before them all the smaller vegetation. The hunter's peril at this moment is great, but fortune has favoured him yet, as he has escaped being trampled to death. In the morning he follows the traces of the herd, and, carefully examining the soil, detects the spots of blood that have fallen from the wounded elephant. He often finds him, so weakened by loss of blood as to be unable to keep up with the rest of the herd, and a new wound is soon inflicted. Patiently pursuing this practice, the hunter has secured many of these princes of the forest." In another place (vol. i. p. 396), but again with reference to the valley of the Kina Batangan river, Mr. St. John remarks, "As this is the only country in Borneo where the elephants are numerous, it is the only one where ivory forms an important article of trade in the eyes of the natives." Now, I am well aware of Mr. Darwin's calculation as to what the accumulated progeny of one pair of slow-breeding elephants might amount to in the course of five centuries, supposing that nought happened to check their increase in the geometrical ratio; but I doubt exceedingly that, in the instance under consideration, the existing great herds of elephants in the north-eastern peninsula of Borneo have descended from some two or three

individuals put ashore by the order of the Sultan of Sulu, a little more than a century ago, continually decimated, too, as these elephants would seem to have been and are at this time; and I doubt it all the more because it appears that herds of wild elephants existed until recently in Sulu! Why, therefore, should the few tame elephants presented to the Sultan of Sulu be landed in Borneo? The remnant of the wild race existed in Sulu within the memory of people now living. On this subject, Mr. St. John fortunately helps us with information. In his notice of Sulu, he remarks, "Remembering Forest's statement that elephants were found in his time in the forests which clothed so much of the soil of the island, I asked Dater Daniel about it; his answer was, that even within the remembrance of the oldest men then alive, there were still a few elephants left in the woods, but that, finding they committed so much damage to the plantations, the villagers had combined and hunted the beasts till they were all killed: I was pleased to find the old traveller's account confirmed."—Vol. ii. p. 243. Why should the elephant of Borneo have been introduced by human agency any more than the *Rhinoceros sondaicus* or the *Bos sondaicus*, which latter would appear to be remarkably numerous on the vast island?—*E. B.*

Enormous and deformed Horns of Red Deer and Roe.—I have been trying to find out the history of the big head, and have at last succeeded. It appears that it was the head of a stag shot several hundred years ago in Wallachia, whence it was sent down the Danube to Constantinople, and thence found its way to Sheffield for cutlery purposes; but a Viennese, seeing it in a cutler's store, bought it and brought it back to Vienna for his collection. He died, and it was then sold, with the rest of his collection, to a Mr. Exinger, a large game-dealer here, who also deals in deers' horns, skins, &c. It was then exposed for sale in the game market, where Julian Fane bought it for me. This story is told me by Mr. Vynes, a Queen's messenger, whom I met at dinner at the Embassy here, and he says he has known the head for years here in Vienna; it was celebrated as a wonder in Hungary and Wallachia, and was said to be one of the largest specimens of red-deer horns in the world. He says it has been examined here and found to be real, though much broken and repaired; the skull, however, was adapted to the horns, which were fastened on to it. I can now tell you what I have hitherto been a little in the dark about myself, that since I have been in Germany I have seen heads in old collections (not for sale) not only as large and with as many points, but larger and with more points. The most remarkable collection in Germany, I believe, is that of the King of Saxony, at the Castle of Moritzburg, about five miles from Dresden; there are there 120 red deers' heads, seventy gigantic ones in one room, and the rest, being deformed and singular specimens, are in another room by themselves. The heads in the large room vary from twenty-four points to fifty, of which latter number there are two, but they are by no means the largest