

PART XXXV.—ZOOLOGICAL COLLECTIONS.

1. *Account of the Capture of a Female Orang Outang, caught on the coast of Sumatra.* By CAPTAIN HULL.

HAVING heard of the capture of the large Orang Outang, which was described in this *Journal*, Number viii. p. 193, Captain Hull dispatched a young man to the spot where it was taken, in the hope of his meeting with another Orang of the same kind. After a lapse of several months he returned to Bencoolen, bringing with him a large female orang, as the fruit of his enterprise.

On his arrival at Truman, where he was kindly received, he heard various accounts from the natives of the animal he was in search of, called by them Orang Mawah, Mawi or Mawy. These animals, they said, resided in the deepest part of a forest, distant from Truman about five or six days journey, and they appeared very averse to undertake any expedition in search of them, stating, that these beings would assuredly attack any small party, especially if a woman should be with them, whom they would endeavour to carry off. They were unwilling also to destroy these animals from a superstitious belief that they are animated by the souls of their ancestors, and that they hold dominion over the great forests of Sumatra. After some days debate, however, and hearing that a Mawah had been seen in the forest, the young man collected a party of twenty persons, armed with muskets, spears, and bamboos, and having marched in an easterly direction for above thirty miles, fell in with the object of his search. The orang was sitting on the summit of one of the highest trees with a young one in its arms. The first fire of the party struck off the great toe of the old orang, who uttered a hideous cry, and immediately lifted up her young one as high as her long arms would reach, and let it go amongst the topmost branches, which appeared too weak to sustain herself. During the time the party were cautiously approaching her to obtain another shot, the poor animal made no attempt to escape, but kept a steady watch on their movements, uttering at the time many singular sounds, and glancing her eye occasionally towards her young one, seemed to hasten its escape by waving her hand. The second volley brought her to the ground, a bull having penetrated her breast, but the young one escaped. She measured four feet eleven inches in length, and two feet across the shoulders, and was covered with red hair.—It is probable from the spot where this animal was found, being so near to Truman, that she was the mate of the one destroyed by the party from the brig. Her remains, consisting of the skin and all the bones, were transmitted home by Captain Hull to Sir Stamford Raffles.

2. *On the use of the Odoriferous Gland of the Alligator as a Bait.* By THOMAS BELL, Esq. F. L. S. &c.

The following is a brief notice of Mr Bell's curious speculations on

* This and § 3, 6, 7. are extracts of memoirs read at the Asiatic Society of Calcutta. They are from the *Calcutta Government Gazette or Journal*, conducted with great ability.

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the use of the submaxillary odoriferous gland of the crocodile, which was lately read before the Royal Society.

Beneath the lower jaw of the alligator and the crocodile on each side, is situated a gland which secretes an unctuous substance of a strong musky odour. About two years since, the author of this paper discovered in it a structure which is without parallel in the glandular system of other animals. His observations were made on the common American alligator. In this animal the external orifice of the gland is situated about two-thirds of the lower jaw backwards from the symphysis, being a longitudinal slit a little within the lower edge of the basis of the jaw, through which exudes the substance just mentioned. During warm weather, when the animal feeds freely, the secretion is copious; but in winter it is much diminished in quantity, and is less powerful in scent. The gland itself is a simple follicle of an elongated pyriform figure lying between the skin and the under surface of the tongue. In an alligator of four feet in length it is about half an inch long, and one-sixth of an inch in diameter. This gland is enveloped by extremely fine and delicate muscular fibres, disposed obliquely, consisting of two fasciulae, passing repeatedly over and under the gland, which unite at its base in a long and slender round muscle closely attached to the corner of the *os thyroideæ*, and following the course of another muscle, apparently identical with the *mylo hyoideus* in the mammiferous animals. The use of the muscle appears to be to bring the gland into a proper position for its discharge, and then to operate the discharge by pressure. The author, considering the situation of the gland near the mouth of the alligator, and the predatory habits of the animal, together with its voracity of fish, and the well-known partiality of fish for odoriferous oils and extracts, conceives that this secretion acts as a bait, attracting the fish to such a position as will enable the alligator readily to seize them in his usual way of seizing his prey, by snapping sideways at them.

3. *Account of the Chiru, or Unicorn of the Himalayah Mountains.* By MR HODGSON, Surveyor General of India.

Mr Hodgson's paper on the *Chiru* concerned the animal which has been so often mentioned as the Unicorn of the Himalayah. The reports respecting this animal were so numerous and concurring, and so borne out by the specimens of single horns sent down at various times to the Asiatic Society, and by Bhotea drawings of a deer-like animal with one horn springing from the centre of the forehead, that scepticism was almost silenced by the variety and quantity of evidence. The zeal of Mr Hodgson for the advancement of knowledge, and which has afforded to the Asiatic Society the means of judging of the Literature, Antiquities, Arts, and Natural Productions of the Himalayan Region, has at length settled the question respecting the *Chiru* or antelope of the Bhoteahs. The skin and horns sent by Mr Hodgson were the spoils of an animal which died in the Menagerie of the Rajah of Nepal, to whom it was presented by the Lama of Digurchi, whose pet it had been. The persons who brought the animal to Nepal informed Mr Hodgson that the favourite abode of the *Chiru* is the Tingri Maidan—a fine plain or valley through which the Arrun flows, and which is situated immediately be-

yond, the snows by the Kooti pass; that in this valley beds of salt abound, to which the *Chirus* are said to resort in vast herds. They are represented as in the highest degree wild, and unapproachable by man, flying on the least alarm, but if opposed, assuming a bold and determined front. The male and female are said to present the same general appearance.

The living subject of Mr Hodgson's description presented none of those formidable attributes with which the tales of the Bhotcas had clothed the *Chirus*. In form and size he offered the common character of the antelope tribe, lived chiefly on grass, and did not seem dissatisfied with his captivity, although his panting showed that even the climate of Nepal was oppressive to him,—he at length sunk under a temperature which rarely exceeded 80°, as a maximum at the commencement of the hot weather. Although timid, and on his guard against the approach of strangers, he would, when warily laid hold of, submit patiently to handling.

The general form of the animal was graceful, like that of other antelopes, and was adorned with their matchless eye. His colour was reddish or fawn on the upper, and white on the lower part of the body. His distinguishing characters were, first, long sharp black horns, having a wavy triple curvature, with circular rings towards their base, which projected more before than behind; and secondly, two tufts of hair projecting on the outer side of each nostril, together with an unusual quantity of bristles about the nose and mouth, and which gave to his head a somewhat thickened appearance. The hair of the animal resembled in texture that of all the trans-Himalayan animals which Mr Hodgson has had the opportunity of examining, being harsh and of a hollow appearance. "It was about two inches long, and so thick as to present to the hand a sense of solidity; and beneath lay a spare fleece of the softest wool.

Dr Abel's remarks on Mr Hodgson's paper chiefly concern the specific characters and dimensions of the animal, and present a formal description of it drawn from the data furnished by Mr Hodgson, and Dr A's. own examination of its remains. Dr Abel proposes to call the animal *Antelope Hodgsonii*, after its discoverer.

4. On the size of the Asiatic Elephant.

The following notice respecting the size of the Asiatic elephant we have received from a correspondent in India. "The catching of the elephants has just commenced, and at least a score of subjects may be procured in the course of the season. It is strange that M. Cuvier should continue to repeat the old story of the Asiatic elephant being *fifteen or sixteen feet high*. I do not believe that they ever exceed *eleven feet*; and some years ago I wrote a letter on this subject, which was published in the *Calcutta Journal*, and in which I requested information respecting any elephant exceeding that size;—but no answer was ever returned to that request."

5. On the Growth of the young Boa Constrictor hatched from the Egg.

In the eighth Number of this *Journal*, p. 22, we communicated, from a correspondent in India, a very interesting notice respecting a young brood of Boa Constrictors hatched from the egg on the 6th July 1825.

Their length when they were hatched was *eighteen inches long*; but we are informed by a letter from our correspondent, dated 10th October 1826, that they have increased to *thirty-eight inches*, having grown *twenty inches* in fifteen months.

6. On the Growth and Habits of a young Rhinoceros. By Mr Hodgson, Surveyor General of India.

Mr Hodgson's observations on the rhinoceros form the continuation of a paper read at a meeting of the Physical Committee of the Asiatic Society in February 1825, on the Gestation of the Rhinoceros, at the close of which he proposed to furnish to the Committee, from time to time, an account of the rate of growth of one of these animals which was born in the Menagerie of the Rajah of Nepal. The first dimensions taken of the animal were made at three days old, when it measured two feet in height, three feet four inches and three quarters in length, and four feet and seven-fourths of an inch in its greater circumference; since that, it has increased in the following proportions: From three days to one month it gained five inches in height, five inches and three quarters in length, and three inches and three quarters in circumference; while, from the age of one to fourteen months, it increased one foot seven inches in height, two feet in length, and two feet seven inches in circumference. From fourteen to nineteen months four inches in height, one foot four inches and a half in length and two feet four inches in circumference; the Rhinoceros being at the date of the last measurement in December 1825, four feet four inches high, seven feet four inches and a half long, and nine feet five inches in circumference.

In general aspect the cub now resembles the mother, the heavy folds of the skin which were wanting in July last being fully formed in December. The nasal horn at the latter period scarcely protruded two inches beyond the skin.

The observations of Mr Hodgson are of great value in reference to all questions respecting the rate of development and full growth of many of the larger animals, respecting which scarcely any authentic statements are to be found in authors, although they have exercised the genius of Buffon and other philosophical writers. The diminished ratio of increase of height remarkable in the later period of development, as stated by Mr Hodgson, renders it probable that the animal will yet be a long time in arriving at its adult size, a supposition which is also rendered probable by its seventeen months' gestation, and the slow growth of its horn.

Mr Hodgson, in pursuing his inquiries, has had occasion to remark the amiableness of the young animal's disposition, both towards his keeper and strangers, an instance, he observes, of the power possessed by Asiatics through their tranquil familiarity of taming the most formidable quadrupeds.—That the rhinoceros will submit to the domesticating influence of man we have seen more than one instance, nor would the tractability of this herbivorous animal seem in any way a matter of surprise, when we know that the fiercest of the carnivorous tribe have become the attached companions of their master, if the rhinoceros had not been held up by writers of every

age and country as a standard of brutal and untameable fury. India exhibits numerous proofs of false conclusions by natural historians regarding the habits and temper of animals, and affords a field of interesting inquiry respecting their instinct, as contradistinguished to what might be called their educatable faculties.—This subject has hitherto, we believe, only been treated by the naturalists of Europe, who have relied in many cases upon very vague or insufficient narratives, but never by any person residing in the native country of the animals whose history has been recorded.

7. *On the Edible Birds' Nests of the Tavoy and Mergui Islands in Siam.*

Edible birds' nests are found in considerable quantity on the islands off the Tavoy coast, but they are very generally met with throughout the Archipelago! They are in most perfection in January, but are gathered also during the six weeks preceding and following that month. The quantity obtainable in any one season is uncertain, for Malay, Chinese, Siamese, and other boats are accustomed to come in amongst the islands, and to carry off part of the produce: it also partly depends upon the dexterity of the nester, who, by disturbing the swallows just when the nest is completed, obliges them to multiply their labours. The operation of the nester is not always free from danger, as he has to climb precipices by the help of ropes and flying ladders made of rattans, and the caves into which he has to penetrate are noisome, and in some places so intricate, that he is apt to lose himself.—The nesters use considerable quantities of arrack and opium. It is probable that the Burman collections did not exceed two Peculs in the season, but there is little doubt that five or six times that quantity might be obtained.

The farm of these nests, which had let the year before only for 500 rupees, was knocked down since we took possession, at 15,000 rupees for those of the Tavoy Islands alone; and 5000 rupees more were expected for those of the Mergui Islands.

ART. XXXVI.—HISTORY OF MECHANICAL INVENTIONS AND PROCESSES IN THE USEFUL ARTS.

1. *On the Explosion of Steam Boilers.* * By JACOB PERKINS, Esq.

It has been generally considered a well established fact, that the caloric of steam, at a given elasticity, is invariably the same when in contact with water; but this is far from being the case. It may be, and often is, so generated as to indicate very high degrees of temperature without a corresponding increase of power, so as evidently to prove that temperature alone cannot be relied on as a measure of the elastic power of steam. Many experimentalists have thus undoubtedly been led into error, especially

* Mr Perkins has been so obliging as to transmit to us copies of this and the following article, which he has printed for the information of his scientific friends.—Ed.

in reference to high temperatures. If any part of the boiler which contains the steam be suffered to become of a higher temperature than the water contained in it, from want of a sufficient supply, the steam will readily receive an excess of caloric, and become supercharged with it, without acquiring proportional elasticity. In some recent experiments I have heated steam to a temperature that would have given all the power that the highest steam is capable of exerting, which would have been 56,000 pounds to the square inch, if it had had its full quantum of water; yet the indicator showed a pressure of less than five atmospheres. Having satisfied myself, by repeated experiments, as to the certainty of this curious fact, the thought struck me, that, if heated water were suddenly injected into the superheated steam, the effect would instantly be the formation of highly elastic steam; the strength of which would depend upon the temperature and quantity of the supercharged steam and of the water injected. To ascertain the truth of this theory, I made the following experiments:

A generator was filled with water and heated to about 500 degrees, and, consequently, exerting a force of about 50 atmospheres; but the pressure valve being loaded to about 60 atmospheres, it prevented the water from expanding into steam. The receiver, which was destitute of both water and steam, was heated to about 1200 degrees: a small quantity of water was injected into the generator with the forcing pump, which forced out from under the pressure valve into the receiver a corresponding quantity of heated water, and this instantly flashed into steam, which, from its having ignited the hemp cord that covered the steam-pipe ten feet from the generator, must have been at a temperature of at least 800 degrees, which would be equal to about 800 atmospheres; but from want of water to give it its necessary density, the indicator showed a pressure of about 5 atmospheres. Whether the pressure of the steam, which was rushing through the steam-pipe, was at 5 or 100, or more atmospheres, the steam-pipe kept up at the high temperature before-mentioned, which I attributed to the steam being supercharged with caloric. The pump was now made to inject a much larger quantity of heated water, and the indicator showed a pressure of from 50 to 80 atmospheres: it soon expanded, the throttle valve being partly opened, to the former pressure of about 5 atmospheres. The water was then injected again and again, and the indicator was observed to oscillate at each stroke of the pump from 5 to between 40 and 100 atmospheres, according to the quantity of water injected; clearly showing that, at this reduced pressure, there was a great redundancy of heat, with little elastic force. It soon occurred to me that to this might be traced the true cause of the tremendous explosions that suddenly take place in low as well as high pressure boilers.

There are many instances where, immediately before one of these terrific explosions had taken place, the engine laboured; showing evidently a decrease of power in the engine. To illustrate the theory of sudden explosions, let us suppose the feed-pipe or pump to be choked; in this case the water would soon sink below some parts of the boiler, which should be constantly covered by it, thus causing them to become heated to a much