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THE ORNITHORHYNCHUS PARADOXUS, OR WATER-MOLE.

[Ornithorhynchus Paradoxus.]

AMONG the strange and interesting productions of that little-explored country, Australia, not one is so anomalous, so wonderful, such a stumbling-block to the naturalist, as the *ornithorhynchus, platypus*, or, as it is termed by the colonists, the *water-mole*. Its first discovery created the utmost surprise; nor has the feeling much abated. The ornithorhynchus is essentially aquatic in its habits, frequenting the more tranquil or currentless portions of the rivers, in the banks of which it excavates its burrow to a considerable depth. If we examine the animal we shall see how well it is adapted for such a mode of life. The total length of the adult ornithonhynchus is about one foot six or seven inches; the body is long, reminding one not only in shape but in colour of the otter. It is covered with a double coat of fur, like aquatic mammalia in general: the outer vest consists of long, fine glossy hair, thickly set, which in some individuals assumes a crisped appearance; beneath this, close to the skin, is a layer of short soft fur, forming an almost water-proof wadding. The tail, which is broad and flattened, terminates abruptly, and is covered above with longer and coarser hairs than those of the body; the under surface of the tail, however, is almost destitute of covering;—at least the hairs are short and thinly set.

The limbs are remarkable for their strength and shortness; the anterior pair especially are very muscular, and the feet well adapted for burrowing, notwithstanding their being largely webbed. The toes are five in number, and terminate in strong blunt claws, capable of scratching the earth with great facility; the web which intervenes between the toes is of a tough leathery consistence, and from its extending beyond the claws might seem to be an impediment in the way of these instruments being fairly and effectually used. It would appear, however, that being loose it falls back, (being perhaps voluntarily retained so,) while the creature is engaged in its laborious task of burrowing, so as not to interfere with the due application of the claws. The advantage of this broad web in an aquatic animal, or one that spends so great a portion of its existence in the water, is very apparent. The hind feet are smaller than the anterior, but also webbed, though the membrane does not extend beyond the roots of the claws, which are sharp and longer than those of the fore-feet. On the hind leg of the male there is, as its peculiar characteristic, a strong sharp spur, the use of which does not appear to be very easy of explanation. It is certainly not used as a weapon of offence; nor are the scratches made by it, during the struggles of the animal, on the hands of those who endeavour to hold it, attended with the slightest ill

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consequence. Formerly this spur was supposed to be a poisoned weapon, by which dangerous, if not fatal wounds were inflicted. This is most certainly not the case. It appears that the mistake arose from the misapplication of English words or expressions by the aborigines.

The most singular part of the ornithorhynchus, however, is the head; at least as regards the external configuration of the animal. Instead of terminating in a snout, as in other mammalia, it is continued into a *beak* resembling that of a *duck*, being broad, compressed, and rounded at the lip; the mandibles of which this beak consists are covered with a cartilaginous or leathery membrane—the outside of the upper mandible being greyish black—the palate flesh-colour; the under mandible is flesh-colour within, and whitish externally. The edges of both are soft, and the lower, which is shorter and narrower than the upper, has its sides internally channelled with grooves like those of a duck, but larger and wider apart. At the base of the beak a loose leathery flap projects from each mandible, and may perhaps form a protection to the eyes, while the animal is engaged in searching for food with the beak plunged deep in the mud. True teeth there are none; there are, however in each mandible, on either side, two horny appendages without roots,—one tuberculous, and at the base of the mandible fairly within the mouth,—the other forming a long narrow ridge on the mandible itself. The tongue is short and thick, and covered with *papillæ*. The eyes are small but bright; and the orifice of the ears is capable of being closed or opened at pleasure. The flesh of this strange animal, though rank and fishy, is eaten by the aborigines, to whom nothing indeed is unacceptable. The question, whether the ornithorhynchus is *viviparous*, or *oviparous*, is not yet settled; one thing is certain, that if the young are produced alive, they are at least excluded from eggs, hatched, as in many of the snakes, while yet within the body of the mother: and this indeed, as recent observations and investigations tend to show, appears to be the fact. Into the physiology of the animal, however, we shall not attempt to enter, our present object being to describe its habits and manners.

The caution of the ornithorhynchus, conjoined with the acuteness of its senses, renders it a difficult mark for the sportsman; nor, except it be severely hit about the head, is it easily killed. If only wounded, it dives, and endeavours to make for its burrow, or rises amidst the dense herbage which luxuriates in such localities. When the animal is watched playfully sporting on the water, the slightest noise or movement is the signal for its disappearance,—nor, even when undisturbed, does it remain many minutes without diving;—the moment of its reappearance (the gun being levelled in the interim) is the only time for the sportsman. Mr. G. Bennett informs us that "these animals are seen in the Australian rivers at all seasons of the year; but a question may arise—whether they do not, in some degree, *hybernate;* for they are more abundant during the summer than in the winter months. When going down, they allow themselves to be carried along by the force of the stream, without making any exertion of their own; but, when swimming against the stream, all their muscular power is exerted to the utmost to stem the force of the current, and it is generally done effectively. I recollect, however, seeing two making repeated and ineffectual attempts to pass a small waterfall during a rapid current of the river, and, after many persevering efforts, they were unable to attain their object." The habits of these animals have been detailed by no one so fully and satisfactorily as by the writer above referred to. He procured, indeed, with considerable trouble, several living specimens, at different times, with a hope of being able to bring them to England,—a hope which was always frustrated. On one occasion, having opened a burrow to the extent of upwards of ten feet, (its course still continuing up the bank,) he captured one of these creatures, which, disturbed from its repose, had ventured to leave its nest at the extremity of the burrow, in order to reconnoitre the cause of the tumult. "When," says Mr. Bennett, "I held the unfortunate *platypus* (ornithorhynchus) in my hands, its bright little eyes glistened, and the orifices of its ears were expanded and contracted alternately, as if eager to catch the slightest sound, while its heart palpitated violently with fear and anxiety." It soon, however, became more reconciled to its situation, and "was placed in a cask with grass, mud taken from the river, and water, and everything that could make it comfortable under existing circumstances." At first it endeavoured by scratching to get out, but soon became tranquil, contracted itself into a small compass, and sank to sleep. In the night it was again restless, but was asleep in the morning, "the tail being turned inwards, the head and beak under the breast, and the body contracted into a very small compass." This seemed its usual position during sleep; sometimes, however, the beak protruded. When disturbed, it uttered a low, soft growl, not unlike that of a puppy; this noise also accompanied its exertions to escape.

The burrow from which this individual was taken "ran up the bank in a serpentine course, approaching nearer the surface of the earth towards its termination, at which part the nest is situated. This is sufficiently large to accommodate the old animal and its young. No nest had yet been made in the termination of this burrow, for that appears to be formed about the time of bringing forth the young, and consists merely of dried grass, weeds, &c., strewed over the floor of this part of the habitation. The whole extent of the burrow, from the entrance to the termination, I found by actual admeasurement to be twenty feet." Yet no heaps of earth near the burrow were observed by Mr. Bennett, nor does he know, as he says, "how, in the progress of excavation, the animal disposes of the loose mould:" perhaps it carries it to a distance, he goes on to observe, as the mason-wasp and carpenter-bee.

Arriving at Lansdown Park, Mr. Bennett observes, "Here I availed myself of the vicinity of some ponds (also inhabited by these animals), to give it a little recreation. On opening the box it was lying in a corner contracted into a very small compass, and fast asleep. I tied a very long cord to its hind leg, and roused it, in return for which I received numerous growls. When placed on the bank it soon found the way into the water, and travelled up the stream, apparently delighting in those places which most abounded in aquatic weeds. Although it would dive in deep water, it appeared to prefer keeping close to the bank, occasionally thrusting its beak (with a motion similar to that of a duck when it feeds) among the mud, and at the roots of the various weeds lining the margin of the ponds, and which we may readily suppose to be the resort of insects. After it had wandered some distance up the chain of ponds, feeding about the shallow water and mud near the banks, it crawled up the bank, enjoyed the luxury of scratching itself, and rolling about. In this process of cleaning itself the hind-claws were alone brought into use for the operation,—first the claws of one hind-leg, then those of the other. The body being so capable of contraction was readily brought within reach of the hind-feet, and the head also was brought so close as to have its share in the universal cleaning process. The animal remained for more than an hour cleaning itself, after which it had a more sleek and glossy appearance than before." This individual never became very familiar, and always manifested the greatest reluctance to be placed in its

box,—from which it escaped one night and was not again to be discovered. December appears to be the month in which the females bring forth their young;—this fact was asserted by the natives, and confirmed by the experience of Mr. Bennett, who procured from a burrow on the banks of the Murrumbidgee river, on the 8th of that month, three young ones, one inch and seven-eighths in length, nearly naked, and which could not have long been born.

On the 28th of December Mr. Bennett visited a noble sheet of water, called Koroa, formed by the Wollondilly river, on the banks of which the burrow of an ornithorhynchus was discovered. In opening it, "the aborigines used their hard pointed sticks, and although the ground was firm, they succeeded as quickly as we could have done with our spades." The method of laying open the burrow was by making holes upon it, four or five feet apart, a stick being passed up the burrow as the work proceeded, in order to ascertain its direction. From this burrow he procured two full-furred young ones, a male and female, beautifully sleek and delicate, most probably having never left the burrow. They lived in captivity about five weeks: their liveliness, their frolics, and gambols affording a constant source of interest. "One evening both the animals came out about dusk,—went as usual and ate food from the saucer,—and then commenced playing with one another like two puppies, attacking with their mandibles and raising the fore-paws against each other. In the struggle one would get thrust down, and, at the moment when the spectator would expect it to rise again and renew the combat, it would commence scratching itself, its antagonist looking on and waiting for the sport to be renewed. When running, they are exceedingly animated,—their little eyes glisten, and the orifices of their ears dilate and contract with rapidity; if taken into the hands at this time for examination, they struggle violently to escape, and their loose integuments render it difficult to retain them." They were found to sleep in various positions,—mostly rolled up like a hedgehog, into a ball, the tail being wrapped over the bill and head,—sometimes in an extended attitude. Their periods of sleep and activity were very irregular, but the dusk of evening in most cases called forth all their energies. During the night they were generally active: night or evening we suspect to be the favourite period in which the ornithorhynchus seeks its food, wanders along the bank, constructs its burrow, and gambols with its mate.

With regard to the nourishment of the young all we shall here say is, that there is every reason to believe the newly-born offspring receive their sustenance in the same manner as in other examples among the *mammalia*. Two large mammary glands secrete a milky fluid in great abundance, which exudes through a number of small tubes in an *areola* or bare circular space on each side of the abdomen. "*Milliken* (milk) come all same as from cow," said a native to Mr. Bennett, who states that milk, and afterwards insects mixed with mud, form the diet of the young: "they first have *milliken* (milk), then *make patla* (eat) bread," &c. as a native expressed himself when asked the question.

A POOR STUDENT'S LITERARY EXPENDITURE.

[From a Correspondent.]

THE circumstances related in 'A Poor Student's Literary Ways and Means,' as well as those to which I have still to request attention, would want much of the interest which ought to belong to them if they were understood as no more than points of personal history. I have no personal feeling to gratify in seeking to have these circumstances recorded in the 'Penny Magazine;' but I think they will not be without interest or utility if understood as illustrating some of the difficulties which a very poor boy has to surmount in acquiring the means of knowledge. So much of those difficulties—consisting in the want of money—as the former paper illustrated, refers to a state of things still present to many; but the illustrations I have now to offer of the difficulties which attended the advantageous disposal of a few pence for the purpose of acquiring information, refer, as I am most happy to know, to a state of things no longer existing.

When a boy was in circumstances which rendered such contrivances necessary as those related in the former paper, it will easily be imagined that he must have found great difficulty in allowing his pence to accumulate to an amount sufficient for the purchase of the books which he required.

When my desires extended beyond the books which single pence or halfpence could obtain, they ascended, in the first instance, to books about three-pence in price. About the year 1816, the only works at that price that presented higher claims than those of nursery-tales, were certain rather closely-printed tracts, in paper-covers, which generally contained either abstracts or reprints of popular fictions, and sometimes tales founded on the plays of Shakspeare and other early dramatic authors. These little books, taken altogether, formed the best and cheapest bargain which a book-purchaser could, in those days, make for three-pence: and it would be difficult to describe the anxiety with which I watched the very slow ascent of my finances to the required sum, and the eagerness with which I hastened to the book-shop when the three-pence was completed. The haste with which I disposed of my coppers on these occasions proceeded not merely from my earnest desire to possess the book, but also from the fear lest the pressure of my external wants should tempt me to some other application of my hoarded pence; which, as I knew from some occasional experience of the sort, I should afterwards bitterly regret. When I had the money, I was never long in deciding on the particular book which should be purchased; for in my many wistful visits to the shop-windows, I had always decided on the object of my next purchase long before I could obtain it. I thus had ample leisure to make my selection, nor was it ever made until the windows of all the book-shops in the town had been subjected to the most careful inspection.

In process of time—and the time was nearly simultaneous with the picture exertions recorded in the former article—my mind outgrew the sort of nutriment which any of the three-penny books I have mentioned could furnish; and I kept myself quite awake to seize any opportunity which might offer of securing stronger and better food. I seemed to discern such an opportunity when one of those itinerant book-venders who carry about from house to house publications in *numbers*, called with his portfolio at the room my parents occupied. This was immediately after the large profit I had made by exposing my pictures in the street during the fair; and I was busily occupied with my water-colours in replenishing my exhausted stock. The man, who was a very civil person, was not deterred by the humble appearance of the apartment and its occupant from displaying his stores before me, when he perceived that I was quite willing to inspect them. Oh! how my heart was delighted by the display of magnificence and varied wealth which this man's portfolio contained. There were various bibles, various histories, various poems. There was John Bunyan's 'Pilgrim;' 'Robinson Crusoe;' 'The Arabian Nights;' 'Drelincourt on Death;' 'Hervey's Meditations;' 'Pamela, or Virtue Rewarded;' 'The History of Henry, Earl of