

for in the pursuit of Entomology is a knowledge of how to combat those insects which cause incalculable damage to the agriculturist especially, and to mankind generally."

It is to be hoped that these remarks will be taken to heart by young collectors, and that the useful hints which are given for collecting, rearing, setting, and preserving insects, all of which have borne the test of actual experience, will in due course be turned to good account by those for whose benefit they have been detailed.

A Zoological Atlas (including Comparative Anatomy), with practical directions and explanatory text. For the use of Students. 231 coloured figures and diagrams. By D. M'ALPINE, F.C.S., Lecturer on Biology and Natural History, Edinburgh. (Vertebrata). Edinburgh and London: W. & A. K. Johnston. 1881.

In most recent works on Biology the authors very properly insist on the necessity for practical work in order to thoroughly understand the subjects, but no attempt hitherto seems to have been made to depict what to see as well as describe how to see it.

In the Atlas before us a series of forms, gradually increasing in complexity, are examined externally and internally, and the results of that examination carefully drawn, so that by a previous study of a plate of any given species the specimen itself is easily understood. The species selected in the present case are the Skate, Cod, Salamander, Tortoise, Pigeon, and Rabbit, all easily procurable forms, and of a convenient size for dissection. We observe that the names of the various parts are placed on the drawing, a very commendable feature; thus the attention is not distracted by referring to an index, and there is no chance of a mistaken reference; while the accompanying descriptions in every case very properly face the plates. These seem to have been prepared with great care and accuracy, and, as an aid to teachers, will be found extremely useful. Indeed, with such an Atlas before him, and a good text-book, the student might almost dispense with the services of a professor.

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ANIMAL LIFE IN BORNEO.

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A FEW remarks about the animals to be found in the neighbourhood of Elopura, Sandakan Bay, may perhaps be acceptable to naturalists. Some months ago I was requested by the Secretary of the Zoological Society to try and secure for him a few of the common *Gymnura* (*G. Rafflesii*)*. The Sooloos of these parts are not clever trappers, and it was no use asking them; but there was an adept at hand, who had been employed by Mr. Low for a similar purpose, and on application to him this nobleman in reduced circumstances undertook to trap for me, and the result was a perfect deluge of birds and animals of all kinds—Argus Pheasants, Partridges, *Gymnuras*, Tingalums, Musangs, and other things—the market, in fact, was overstocked.

The trap used is a cruel one: a loop arranged at the end of a stout bent sapling, so that when an animal is noosed it is suddenly jerked, usually by one leg, upside down in the air, and held suspended until the trapper comes round, which is generally not

* This curious animal, the native name for which is *Bulau*, may be regarded as a connecting link between the Hedgehogs and Shrews, resembling a Hedgehog with flexible hairs, and having an elongated shrew-like head, and a long, almost bare tail like that of a rat. It was originally discovered at Sumatra by Sir Stamford Raffles, who described it as a Civet under the name *Viverra gymnura*, and besides inhabiting Borneo is also found in the neighbouring island of Sarawak. It is about two feet in length, of which the half is tail.—Ed.

till some hours later, when its leg in most cases is found to be broken. This sort of thing does not conduce to longevity, and accordingly, after spending some fourteen or fifteen dollars, I had to leave off buying.

Amongst the victims there were brought to me some ten or a dozen *Gymnuras*. They are stubborn, pig-like animals, with a strong rancid smell, and their most noticeable peculiarity is that if you approach close to them they jump into a threatening attitude, with jaws wide open, and so remain for a long time. On putting a bit of stick near it is seized with one sharp snap, the imprint of the teeth being left visible. Those brought me here were of a pure milk-white; others that were obtained about fifteen miles away had all the longer hairs tipped with black.*

There is very little animal life to be seen in the tropical forest round this place. I may take half-a-dozen long walks through the forest without seeing a single creature, even though it be but a Monkey or a Squirrel; yet there are plenty of animals if they would only show, but they are nearly all nocturnal, and where they hide in the day it is hard to say. This I could understand in a country where any species of the flesh-feeding *Felidæ* occur, but here there is nothing more formidable than a Civet or a Musang. That animal life abounds, however, is plain; one has only to visit the top of any small hill, and a regular path is found to be worn along the ridge of it, entirely made by the numbers of small mammals that continually wander about at night.

Of the wild animals of this particular district (spoken of by old travellers as "Felicia") the most noticeable is the Elephant. That it should occur in Borneo is only what might be expected, but why it should be confined to this part of the island is strange. To the south of the Bay of Sandakan vast herds roam the forest. The proportion of tuskers to the others is about one in four or five. The natives of these parts are not great hunters, but they sometimes find it necessary to turn out in defence of their crops and kill one or two.

Rhinoceroses are not infrequent; the tracks of one or two may usually be seen in the course of a walk in the low districts. I have

* The general colour of Sumatran specimens is blackish grey, with the head and neck much paler, inclining, in fact, to white, and with a black streak over each eye. Those procured in Sarawak are said to resemble the Bornean type.—Ed.

sent home three or four skulls, which have been identified as those of *R. sumatrensis*. The natives declare a three-horned species exists, and I have seen a skull which I should not like to say was not a three-horned one, the third horn, however, being very small.

Sportsmen may be interested to learn that a fine large species of Red-deer, probably a Sambur, is common enough in the forest,* besides one or two species of the genus *Bos*. I have seen a herd of at least fifty wild cattle at once, and was confronted by the patriarch, an enormous bull with splendid horns, who looked at me, down a glade in the forest, and seemed much inclined to charge. Having seen his harem, however, safely out of danger, he trotted off after them. All the individuals in this herd were coal-black. The only species I have been able to identify with any certainty is *B. Banteng*,† Raffles; but I am nearly sure we have also common wild cattle, in all probability descendants of beasts turned loose by some of the early navigators who visited these parts.

Bears (*Ursus malayanus*) and a species of Roe-deer [quære, *Cervulus muntjac*?—Ed.] are to be met with sometimes; Mouse-deer (*Tragulus javanicus*) are plentiful in places, but can hardly be dignified with the title of "big game"; while of wild pigs I believe I have made out four distinct species, one of which seems identical with the *Sus leucomystax* of North China, and another, like the wild cattle, appears to be of European origin.

Of other animals perhaps the most interesting that I have seen is a *Mydaus*, which is said not to have occurred at a lower elevation than 7000 feet.‡ Here, however, we get it at sea-level, and there are hardly any hills above a few hundred feet high within forty miles of us. The smell of this animal appears to me to have been somewhat overstated, although I must say that once

* Is this distinct from *Cervus equinus*, Cuv., found in Borneo, Sumatra, and Singapore; and is *equinus* distinct from *C. aristotelis*, Cuv.? Sir Victor Brooke refers to intermediate forms (skulls and antlers) which he has seen (Proc. Zool. Soc., 1878, p. 901).—Ed.

† Better known as *Bos sondaicus*, an introduced species in Borneo. What the "common wild cattle" may be, if not *sondaicus*, remains to be ascertained.—Ed.

‡ Of this genus *M. meliceps*, Cuv., is recorded from Sumatra and Java; *M. taroides*, Blyth, from Assam and Araccan.—Ed.