April 24, 1879] Nature

Lucien Bonaparte, puts it next to the West African Buphaga. Now the Buphaga are certainly dull birds, while Scissirostrum is described in the "Malay Archipelago" as "almost entirely of a slaty colour, with yellow bill and feet, but the feathers in the tail, rump, and inner secondaries, terminate in a light glossy pencil or tuft of a vivid crimson" (l. 430). I wrote with this passage of Mr. Wallace's under my eyes, and refer in a footnote to his volume for the vivid crimson. I did not say the bird was brilliant, I merely noted the colours on each termen of its tail and back. The case really stands thus: If Scissirostrum was differentiated from a generic ancestor generally resembling Buphaga, we have to inquire, why did it develop those ornamental adjuncts? and my answer is, because while Buphaga perhaps have not the rich sexes, Scissirostrum tends off "grains and fruits.

2. Santarem, of which it is said the pastures are destitute of flowers, and also of animal life, with the exception of a few small plain-coloured birds, is one of the richest localities for flowering shrubs in South America. Now, this passage to which Mr. Wallace takes exception is not mine, but is a textual quotation from Mr. Bates ("Naturalist on the Amazons," p. 183). It is given in inverted commas in my text, with reference to the original in a footnote. I was, of course, aware that the large yellow woods generally were full of brilliant birds, and that the butterflies in the adjacent forests were gorgeous in the extreme. What I wished to point out was that in particular spots like these meadows, where the general aspect of vegetation was more subdued or artificial, the more delicate birds may find great varieties in this respect nearer home in a meadow, an adjacent Warren, and a moor or swamp beyond it. Moreover, the passage was professedly quoted, simply as showing the general aspect of vegetation like the scene described by Darwin, which was not represented by the generic name of travel. May I add a sentence from a private letter of Mr. Darwin's, which helps out the same view on a larger scale? "The contrast," he says, "is in the colour of the birds in Patagonia" (where he had just noticed the sombre aspect of nature), "besides the bright green beak-decked plumes of the Flata is very striking.

3. About a certain squirrel, described in the "Malay Archipelago" as having a tail "ringed with grey, yellow, and brown," and not "ornamented with vivid yellow," Mr. Wallace now says it "is one of the dullest of the group," while he did not "say a word about its feeding on 'brightly-coloured fruits.' But he did say that it would eat "any fruit." (l. 192), and I presume, therefore, that it sometimes eats "brightly-coloured food."

4. So far from the colours of caterpillars being "mostly protective," every entomologist knows that a large number of caterpillars in every part of the world are conspicuously coloured, True; but Mr. Wallace himself was the first to suggest that "the colours of the caterpillars are themselves protective by giving warning of inedibility; and I am at a loss to understand what he means by this going back upon his own words, I took my statement from Sir John Lubbock's lecture "On Coloured Insects," pp. 23-24, where this fact of universal protective colouring in larvae is very clearly brought out."

5. "Again, the ground-feeding pheasant family are passed over as containing only one brilliant bird, the peacock, whereas it abounds in species of the most gorgeous colour. But my words are very different from this—Even among the pheasants themselves," I say on p. 176, "many species are far from brilliant; and when we come to compare the whole family with that of the parrots or the humming-birds, we shall find that the peacock alone can fairly come into competition with the typical fruit-eaters and flower-feeders. Mr. Wallace goes on to mention amongst others the Imperial pheasant of the Himalayas, and the intensely-brilliant fires of the peafowls of the Malay countries, among the most brilliantly-hued species. Any one would suppose from his review that I had totally overlooked these cases; but in the very same paragraph with the sentence which Mr. Wallace blames the following passage and context follows: The fascinations of the Humayus and the Malay Archipelago, with their great brilliant fruits and flowers and their exquisite insects, form the haunts of the most beautifully-hued species of pheasants." (p. 177). As a matter of fact, before we published the first part of Reptilia, I had carefully compared all the living pheasants in the Zoological Gardens, and all the preserved specimens in the British and Oxford Museums; and I feel sure that any one who does the same will agree with me that the peacock alone can be placed in the very first rank of brilliantly coloured.

6. How much the subjective element enters into these questions may be seen from the following remark of Mr. Wallace:—"The tiger, the zebra, the beautifully-marked antelopes, and the spotted deer and giraffes, which are really among the most brightly-hued of all animals are quite as celebrated for their full-coloured as for the naked hues of the squints and moleys." Now I confess myself simply astonished at the statement that the zebra, all animals in the world, is brightly-coloured—a creature without a following of anything but cream-coloured and black about its body. Quite apart from the nature of food or surroundings, I call a puma a brightly-coloured mammal; or a mandrill; or a Rhinoceros monkey; or a Canadian chipmunk; but certainly not a tiger, a zebra, or a giraffe, none of which has a single trace of scarlet, blue-green, or bright yellow.

No one who knows anything of Mr. Wallace could for one moment imagine him capable of intentionally misrepresenting the humblest opponent in the smallest particular; and I owe him many thanks for much kind and appreciative criticism both on this and several previous occasions. Yet I cannot help thinking that in these instances, and others with which I will not burden your space, he has unconsciously permitted more difference of opinion than the appearance of positive errors in fact.

GRANT ALLEN

Remarks by the Reviewer

1. Scissirostrum Paggi is universally placed in the stargrass family. Its affinity to Buphaga is very doubtful, while its crinicolous tail-coverings are different from "a tail of vivid crimson" which Mr. Allen gives it (l. 181).

2. I object altogether to founding theories on chance expressions of travellers. It is curious, that in my "Travels on the Amazon" (p. 157) I refer to these same Santarem pastures as "There were some boggy meadows here, more like those of Europe than one often sees so near the equator, on which were growing pretty, small Melastomas and other flowers. The paths and canopies were covered with flowering myrtles, tall Heliotropes, and many handsome palm, canes, and dogwoods." These open meadows and canopies really exhibited more conspicuous flowers than the woods and forests which swarmed with brilliant butteflies and birds.

3. I referred to the squirrels, because it was the only example given by Mr. Allen which I could at the moment test.

4. My argument is that, the colours of caterpillars are often as varied, as vivid, and as beautifully arranged as in birds and winged insects. This is not necessary for protection by "concealment" or "sneakery" for which purpose any tint contrasted with a rule, such as black, or white, or ringed with black and white, would have sufficed.

5. The "pleasing" question I leave, as Mr. Allen has placed it, for the consideration of naturalists.

6. Here it seems to me Mr. Allen is himself changing his ground. His main argument is that the aesthetic tastes of the higher animals are the same as ours, yet he objects to the elec- tron-papered and laughable idea of a creature called "brightly-coloured." Surely they are more beautiful than the mantrill or the Rhinoceros; while among animals white is as much a colour as among flowers.

A. R. WALLACE

Nitric Acid Batteries

I include the results of some experiments I have lately made to ascertain if the ease of working the nitric acid batteries of General and Baunen could be reduced. I find that the nitric acid can be replaced by a mixture of half nitric and half dilute sulphuric. And the latter gives a higher temperature for nearly three hours. The experiments were made with a large surface voltaic coil, and the gases are very distinct from one minute every half-minute; four plate-size cells were used. The experiments were repeated, and every care taken to avoid any error. I have also used the mixed acids very successfully with twenty-eight cells for the electric light. I presume the increased rate of resistance of the battery being slightly lowered by the addition of the dilute sulphuric acid in the porous cell. I may add that the fumes were much less than when nitric acid alone is used.

John Henry Knight

Farnham, April 19

The Black Rat

In regard to the distribution of the black rat (Mus rattus), your correspondent may be glad to know that this animal, spread

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