

No. 2 (♂), ad., Mazoro, north of the mouth of the Zambesi (Earl Russell).—Feathers of the middle of the breast and belly quite black; shaft-streaks on the back much fainter than in No. 1; feathers behind the gape white and, passing down the sides of the neck, entirely surround the naked throat; sides of the neck black; long spurs with a rudimentary second pair on each tarsus. Wing 7·4, tarsus 2·4.

No. 3 (♀), immature, Dar-es-Salaam (Sir John Kirk).—Most of the feathers on the centre of the breast and belly white, with wide black margins and black shafts; on the back like No. 1, but more black cross bars and spots; *feathers from the gape white with black shafts*, and on the sides of the neck black with white edges; no spurs. Wing 6·4, tarsus 2·1.

No. 4, ♀ ad., River Tana, Sept. 1888 (H. C. V. Hunter, Esq.).—Breast and back like No. 1; feathers behind gape white, and, passing down the sides of the neck, surround the bare throat; sides of the neck black with white edges; no spurs. Wing 7·1, tarsus 2·1.

No. 1 and No. 2 come from near the locality (Tette) whence the type of *P. Humboldti* was originally described; No. 3 almost exactly answers the description of that type; while No. 4 comes from the same locality (Osi River) whence *P. leucoparæus* was obtained, and both in plumage and sex corresponds exactly with Fischer and Reichenow's description. As there is not the slightest doubt that these four specimens represent only one species, it is evident that *P. leucoparæus* is synonymous with *P. Humboldti*.

XVII.—*A few Remarks on Prof. Packard's Papers entitled "Life-History of Drepana arcuata" and "Hints on the Evolution of the Bristles, Spines, and Tubercles of certain Caterpillars"* (Proc. Boston Soc. Nat. Hist. vol. xxiv. pp. 482-559). By A. G. BUTLER, F.L.S., F.Z.S., &c.

THE above-mentioned very suggestive papers, for a copy of which I am indebted to their indefatigable author, constitute one continuous article, containing much valuable information diligently brought into a small compass.



Whilst admitting the force of many of Prof. Packard's arguments and the truth of most of the facts upon which they are based, it appears to me that at the outset there is one great difficulty, viz.:—If the arboreal habits of many moth-caterpillars have tended to produce hairs and spines, why is it that the greater number of butterfly-caterpillars so ornamented feed upon low plants—the *Vanessæ* on nettles and thistles, the *Argynnides* on species of *Viola*, the *Satyridæ* and *Hesperiidæ* on grasses and low-growing plants? Why, again, are many of the most hairy moth-caterpillars, such as that of *Euprepia caja*, confined to low herbage?

Prof. Packard has shown that the spines and humps of many larvæ tend to assimilate them to their surroundings, thus rendering them more liable to be overlooked by insectivorous animals; the existence of this resemblance, which nobody will be inclined to deny, since all field-entomologists have repeatedly observed it, can be explained by the action of natural selection in preserving those individuals which tend thus to become less conspicuous. In the case of spined Geometrid larvæ already assimilated to twigs it seems only natural that the atrophy of the abdominal legs on the looping portion of the larva should render outgrowths from other portions of the same segments more probable, and when such outgrowths tended more perfectly to conceal the larvæ from observation there can be little doubt that they would be retained.

A few of Prof. Packard's observations are open to question, and to these I would now briefly advert.

Speaking of the larva of *Dryopteris* at p. 490 he says it "is as well fitted as that of *Drepana* by its protective mimicry to avoid the gaze of birds and insect-enemies, while its longer bizarre 'tail' renders it still more forbidding to any insect assailants." Is this an ascertained fact or only a supposition? Has any bird ever whispered to Prof. Packard that a caterpillar with a "tail" or with caudal appendages of any kind is forbidding? Is not all the talk about terrifying colours, processes, and attitudes in caterpillars pure conjecture, which experiment proves or will prove to be erroneous?

The larva of *Cerura vinula* has two caudal processes with exsertile tentacles, used for driving off ichneumons; but the fact that these processes are so used (as I have observed personally) is not sufficient; they are also supposed to alarm birds, although they certainly do not.

In like manner the colouring of certain caterpillars is said by many able writers to serve as a danger-signal. It is quite



true that gaudily-coloured caterpillars are frequently avoided or very cautiously approached by insect-enemies; but it is assuming too much to declare that fear based upon reasoning is the explanation of the respect shown to such colouring; it appears to me to result rather from want of familiarity with or dislike to meddle with startlingly coloured larvæ, and can as little be attributed to reason as the dislike shown by most birds for white clothing or straw hats.

P. 497: "As hairy caterpillars are not usually devoured by birds, these hairs and spines have originated through natural selection and are danger-signals, indicating to birds that the wearers of such hirsute and bristling armature are inedible." This statement is far too broad; for, although non-insectivorous birds naturally do not touch hairy larvæ, they are known to be eaten by the Cuckoo, and I have proved repeatedly that the Missel-Thrush, Song-Thrush, Blackbird, and Chaffinch do not hesitate to kill and eat them. I have never known any bird to show apparent fear of them.

"Every one knows how efficacious any hairs or bristles are in deterring ichneumons and *Tachinæ* from ovipositing on caterpillars, and it is well known that naked or slightly piliferous larvæ are more subject to their attacks than those which are densely hairy or spinose."

I think if Prof. Packard were to collect full-grown larvæ of *Euprepia caja* in England he would find (as I have done repeatedly) that these densely hairy larvæ are more subject to the attacks of ichneumons than almost any caterpillar excepting that of *Ganoris brassicæ*. I should say that at least one in five perishes from this cause, and I have even known it worse than that, for I remember on one occasion that I only reared two out of a score of these larvæ, all the rest being filled with ichneumon-maggots.

P. 509 (note): "It may be questioned whether any wingless female Lepidoptera live on herbaceous plants." Well, the larva of *Orgyia antiqua* is omnivorous and the larvæ of *Nyssia* feed on trees or low plants (according to Stainton); so that this question has already been answered.

I have thought it fair to call attention to these little blemishes in a paper the value of which I do not for a moment wish to depreciate, because in the present day some of the disciples of Darwin are, as it seems to me, far too eager to attempt to explain facts which at present we have not sufficient data upon which to argue. One thing is certain, and that is, that so long as we assume that all living creatures are endowed with the same likes and dislikes which we our-



selves possess, and upon such an absurd assumption build up a theory, we shall hopelessly grope for real light on the problems of Nature.

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XVIII.—*Description of a new Genus and Species of Rhynchophorous Coleoptera.* By D. SHARP.

IN the summer of 1890, I received from Mr. Bartlett-Calvert, of Santiago, some specimens of a handsome weevil that he and Dr. Philippi thought would probably be new. It was accompanied by the following information:—"The weevils were found by me last year on the Pichi Nitrou Cordillera of Araucania, living on the *Araucaria imbricata*. The weevil lives in the body of the *Araucaria*, which it appears to mine in all directions, the pupa being buried in the rotten débris and frass; it lives at the height of 2300 metres, and I found it on nearly all the old trees, but never more than four or six specimens on each, and always in pairs, these being embedded in the crevices formed by the scab-like bark of the tree; some were feeding on the odorous resin which exudes from the lacerated trunk. The imago was found in the months of January and February." The larva and pupa were also found by Mr. Bartlett-Calvert and transmitted to me, but arrived in a state of complete disintegration.

On examining the insect thus alluded to, I was much interested to find that it is very closely allied to our genus *Hylobius*; a genus attached, so far as I know, exclusively to Coniferæ, and extending throughout the northern hemisphere, but apparently most numerous in species in E. Siberia, N. China, and Japan. Mr. Calvert's genus, which I propose to call *Calvertius*, is almost equally closely allied to the genus *Heilipus*, which in Tropical America is extremely numerous in species, some hundreds having been already described. Lacordaire considers *Heilipus* to be a composite genus, and it is therefore, without a knowledge of all its species, not quite legitimate to infer that some of them may not prove to be congeneric with *Calvertius*; but, so far as I can ascertain, this is not the case, and Mr. Pascoe, who has given more attention than any other entomologist to the big S. American genus, has been kind enough to inform me that he does not know any species of it to which *Calvertius* is specially allied.



Butler, Arthur G. 1891. "XVII.—A few remarks on Prof. Packard's papers entitled "Life-history of *Drepana arcuata*" and "Hints on the evolution of the bristles, spines, and tubercles of certain Caterpillars" (Proc. Boston Soc. Nat. Hist. vol. xxiv. pp. 482–559)." *The Annals and magazine of natural history; zoology, botany, and geology* 7, 147–150.

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