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the Ceylon and Japan forms of *O. secretus*, but unfortunately a varietal name (*lobulata*, Maskell) has been applied to the Japanese insect, which is the true *secretus*.

Monophlebus Championi, sp. n.

Monophlebus sp., Ckll., Biol. Centr.-Amer., Coccidæ (1899), p. 3, middle of page.

This name is proposed for the species described in the place cited from a male, having only four fleshy processes on the abdomen. It was hoped that the female might be obtained; but as this now seems unlikely, it is best to give a name to a species so strongly distinguished.

Cryptophyllaspis Rübsaameni, sp. n.

Gall small, cylindrical, about 2 millim. long, thickly clustered on leaves of *Codicæum*.

♀.—Orange, oblong, caudal end sunken, overlapped at the sides by lobiform projections; no circumgenital glands; anal orifice broad-oval, about $17\ \mu$ long, and distant about $39\ \mu$ from bases of median lobes; lobes and squames formed as in *C. occultus* (Green); three pairs of lobes, not even the median ones darkened in the least; median lobes slightly notched on each side; squames narrow and pointed, strongly fringed; beyond the third lobe are three double squames, each having the appearance of two squames united basally; spines small.

Hab. Bismarck Archipelago; received from Mr. E. H. Rübsaamen.

I sent a copy of the description to Mr. Rübsaamen, to be published in connexion with his studies of galls, but it seems desirable that it should also appear in a paper devoted to Coccidæ.

East Las Vegas, New Mexico, U.S.A.,
Oct. 31, 1901.

IV.—The “Cahow” of the Bermudas, an Extinct Bird.

By A. E. VERRILL.

DURING my two recent visits to Bermuda I made special investigations in regard to the history and identity of the “cahow” or “cohowe,” a bird described by the earliest settlers as very abundant and easily captured, so that its flesh and eggs were largely used as food. Indeed, had it not

been for this source of food-supply in winter, it is probable that many of the early shipwrecked crews and first settlers would have died of starvation. Good accounts of the bird and its habits were written by two of the party wrecked on these islands with Sir George Somers in 1609. Other published accounts were written by some of the earliest settlers, especially by the Rev. Lewis Hughes and Governor Butler, 1614 to 1621. See Lefroy's 'Memorials' and the 'Historye of the Bermudaes,' by Nathaniel Butler (not by John Smith, as supposed by the editor).

The islands were settled in 1612, and in 1616 this bird had become nearly extinct, as stated by Governor Butler. This was largely due to the famine of 1615, when 150 starving people were sent by Governor More "in the beginning of the newe yeare" to Cooper's Island, which was one of the principal breeding-places, to feed on the birds and their eggs or young (for they bred in December and January, when other birds could not be obtained). These famished people, according to Mr. Hughes and Governor Butler, were inordinately gluttonous, and killed and ate the birds in vast and wasteful numbers, so that many persons soon became ill, and some died of surfeit. This caused their subsequent removal to Port Royal, where they had to live largely on fish; but still they could get some of the birds from "the adjacent islands." This statement indicates that the cahow bred also on some of the islands in Great Sound.

The following extracts from the 'Historye of the Bermudaes,' by Governor Nathaniel Butler, written about 1619, relates to the famine of 1615, and shows some of the causes of the very rapid extermination of the birds:—

"Whilst this Pinnace was on her way for England, scarcetie and famine every day more and more prevayleinge upon the sickly colony, caused the governour to look well about him; in the beginning of the newe yeare, therefore (1615), 150 persons, of the most ancient, sick, and weake, wer sent into Coopers Iland, ther to be relieved by the comeinge in of the sea-birds, especially the Cahowes, wher, by this half hunger-starved company, they are found in infinite numbers, and with all so tame and amazed they are, that upon the least howeteinge or noyce, they would fall downe, and light upon their shoulders as they went, and leggs as they satt, suffering themselves to be caught faster than they could be killed.

"Wittnesse the generall carriage and behaviour of this company, who being thus arrived and gott up to a libertie and choice of eateing as much as they would, how monstrous

was it to see, how greedily everything was swallowed downe; how incredible to speake, how many dozen of thoes poore silly creatures, that even offered themselves to the slaughter, wer tumbled downe into their bottomlesse mawes: wherupon (as the sore effect of so ranck a cause, the birds with all being excedeingly fatt) then sodenly followed a generall surfettinge, much sicknesse, and many of their deathes."

In the next year (1616) a law was passed, "but overlate," to prevent the "spoyle and havock of the cahowes and other birds." Cooper's Island, Castle Island, and several smaller islands, where it probably bred, were fortified and garrisoned from 1612 to 1620, and this was, without doubt, another important factor in its extermination.

The act of 1616 is thus referred to in Governor Butler's 'History':—

"In the same moneth he held his second generall Assize at St. George's, as irregularly as the first, wherein not any matter of note was handled, only a proclamation (or rather article, as it was then tearmed) was published (but overlate) against the spoyle and havock of the cahowes, and other birds, which already wer almost all of them killed and scared awaye very imprevidently by fire, diggeinge, stoneinge, and all kinds of murderinges."

It was probably entirely extinct by 1625 or earlier, and it seems to have been entirely forgotten by the natives for over 200 years. Mr. J. L. Hurdis, in 1849, thought that he had rediscovered it breeding on Gurnet Head Rock, for he found a few pairs of "dusky shearwaters" (probably *Puffinus Auduboni*) breeding there in crevices of the rocks. But the cahow was certainly *not* a shearwater. None of the early accounts apply to the shearwater, in respect to size, colour, habits, &c. Moreover, the flesh and eggs of the bird are described as of excellent flavour, which is not the case with the shearwaters, all of which have such a strong, oily, and musky flavour that they are inedible. Moreover, the cahow bred chiefly in holes in the soil, "like conyes in a warren." It laid one large white egg, "like a henne's egg" in size, colour, and flavour.

The early writers describe another nocturnal sea-bird that they called the "pimlico," from its note; but it was not eaten by the settlers. This was, without much doubt, the shearwater found by Mr. Hurdis. This name is still used by the native fishermen for the shearwater.

Some writers have been misled as to the breeding-place of the cahow, in consequence of the name of the small, high, almost inaccessible, bare island, now often called "Gurnet

Rock," but formerly called Gurnet Head Rock, as it was named on the map made before 1622 by Norwood. This island was thus called because it lies in front of "Gurnet Head," a high cliff on Castle Island, on which a fort, now in ruins, was built about 1615. This name occurs in Governor Butler's 'History,' written about 1619-1620, as well as on Norwood's map of 1622.

This name, it appears, does not refer to that of a bird (the gannet), which several writers have imagined to have been one of the old names given to the cahow, in consequence of confusing it with the real gannet; but there is no evidence whatever to support that view. Probably Mr. Hurdis was also misled by the name of this rock when he supposed that the cahow could be found breeding on it. There is no reason whatever for supposing that it ever has bred there, even in the earliest times, *for there is no soil* on the summit in which the cahow could have made its nests, as I ascertained by a personal examination this year. Cooper's Island is the only particular place that the early writers mentioned by name as a breeding-place of the cahow, though they say it bred on several of the smaller uninhabited islands. The soil is deep on some parts of Cooper's Island, and at present is filled with the holes of large land-crabs, where it is not cultivated. Possibly the cahow may have made use of the deserted holes of the crabs for its nests, instead of making new ones. Cooper's Island contains about 77 acres, so that there was room enough there, before it was settled, for a large colony of these birds. Governor Butler wrote (about 1619) that at the time of the 1615 famine "they are found in infinite numbers," breeding there. It may yet be possible to find the bones of the cahow by excavations made in suitable places on Cooper's Island, but the best of the soil has long been cultivated. We made excavations for this purpose on Castle Island and Goat Island, both long uninhabited, but without success, though we found bones of other birds, many fishes, two human skeletons, gun-flints, and various old relics, due to their ancient garrisons. Castle Island was again garrisoned during the war of 1812, after long disuse.

What may be said of the bird can be briefly summarized as follows:—

1. The cahow is an extinct web-footed sea-bird, unknown to ornithologists. It rapidly became extinct over 250 years ago, as the direct result of the occupation of the islands on which it bred by the earliest settlers.

2. It was not a shearwater, nor like any other known member of the petrel family. It may have been related to

the auks (*Alcidæ*), some of which have similar white eggs and burrowing habits, and are edible.

3. It was strictly nocturnal in its habits. It flew only at night and made a "strange hollow and harsh howling" and a loud call, from which its name (cahow) was given. It came readily to persons imitating its note, and could then be easily taken by the hand, in the night.

4. It had good powers of flight, but could also run about on the ground without difficulty. It was very tame and unsuspicious.

5. It laid generally, if not always, in burrows in the soil, a single large white egg, of good flavour, like a hen's egg in size and taste.

6. It arrived at the Bermudas in October and remained till about the first of June (*Hughes*).

7. It laid its eggs in December and January, "in the coldest months of the year." In this respect it differed from all other sea-birds of the northern hemisphere. Therefore it probably spent its summer south of the equator, or else it was a local pelagic species that remained constantly at sea in summer, perhaps not far away.

8. In size it was compared to a "pigeon" and to a "green plover" and to a "partridge." Therefore its egg must have been very large in comparison with the size of the body of the bird. The large number of birds said to have been eaten at a meal also indicates a rather small bird.

9. It had a strong hooked bill and could bite viciously. No mention was made of its ejecting oily or other matter from its bill for defence, as do the petrels.

10. Its colour was "russet-brown" on the back; its quill-feathers were russet-brown and white; its belly was white (*Strachy*).

In this combination of characters it differs from all known birds.

The following graphic account of the bird and its habits was written by Mr. W. Strachy, one of the party of 150 persons who were wrecked with Sir George Somers in the 'Sea Venture,' July, 1609:—

"A kinde of webbe-footed Fowle there is, of the bignesse of an English greene Plover, or Sea-Meawe, which all the Summer we saw not, and in the darkest nights of November and December (for in the night they onely feed) they would come forth, but not flye farre from home, and hovering in the ayre, and over the Sea, made a strange hollow and harsh howling. They call it of the cry which it maketh, a Cohow. Their colour is inclining to Russet, with white bellies, as are

likewise the long feathers of their wings, Russet and White, these gather themselves together and breed in those Ilands which are high, and so farre alone into the Sea, that the Wilde Hogges cannot swimme over them, and there in the ground they have their Burrowes, like Conyes in a Warren, and so brought in the loose Mould, though not so deepe; which Birds with a light bough in a darke night (as in our Lowbelling) wee caught, I have beene at the taking of three hundred in an houre, and wee might have laden our Boates. Our men found a prettie way to take them, which was by standing on the Rockes or Sands by the Sea-side, and hollowing, laughing, and making the strangest outery that possibly they could; with the noyse whereof the Birds would come flocking to that place, and settle upon the very armes and head of him that so cryed, and still creepe neerer and neerer, answering the noyse themselves; by which our men would weigh them with their hand, and which weighed heaviest they took for the best and let the others alone, and so our men would take twentie dozen in two houres of the chieftest of them; and they were a good and well relished Fowle, fat and full as a Partridge. In January wee had great store of their Egges, which are as great as a Hennes Egge, and so fashioned and white shelled and have no difference in yolke nor white from an Hennes Egge. There are thousands of these Birds, and two or three Ilands full of their Burrowes, whether at any time (in two houres warning) wee could send our Cockboat, and bring home as many as would serve the whole Company: which Birds for their blindness (for they see weakly in the day) and for their cry and whooting, wee called the Sea Owle; they will bite cruelly with their crooked Bills."

V.—On a small Collection of Butterflies made by C. Stuart Betton in British East Africa. By A. G. BUTLER, Ph.D.

THE following species were received this year from Mr. Betton, collected at E. Quaso, Masai, in October 1900.

Nymphalidæ.

1. *Melanitis solandra*, Fabr.
2. *Neocænryra Gregorii*, Butler.
3. *Precis Gregorii*, ♂ ♂ ♀ ♀, Butler.

The female of this species was new to me; it is interesting