

continuo, breviter adnato, recto, simplice, acuto: operculo tenui, corneo, arcte spirato, medio concaviusculo, intus obtuse umbonali. Diam. major 13, minor 10, alt. 5 mill.
Hab. ad Damboul, ad verticem rupis, in rimis saxorum.

It differs from *C. loxostoma*, Pfeiffer (a large and handsomely marked variety of which was found on the same rock), in colouring, epidermis, depth of suture, narrower and deeper umbilicus, and the more circular and vertical aperture, which exhibits nothing of the diagonal departure from the axis observable in Pfeiffer's shell. The peristome also is acute and single, instead of being double, slightly expanded and thickened, as in that species, of which Mr. Layard's specimen is variegated with radiate and undulated chestnut stripes, and with a single band on a fulvous ground.

London, June 1853.

X.—*Notes on the Ornithology of Ceylon, collected during an eight years' residence in the Island.* By EDGAR LEOPOLD LAYARD, C.C.S.

To the Editors of the Annals of Natural History.

GENTLEMEN,

Should you deem the accompanying notes on the birds of Ceylon worthy of a place in your Journal, they are at your disposal. I flatter myself that they will be found to contain a complete list of those birds as yet discovered in Ceylon. I have had the advantage of consulting with Mr. Blyth and Drs. Templeton and Kelaart, with each of whom I have been on terms of the closest intimacy, and we mutually communicated our discoveries. I have myself seen and shot most of the birds enumerated, in their native haunts, for whether walking, driving or riding, I always carried my telescope and collecting gun, and I have thus traversed the greater part of the island. Besides travelling, I have been some years stationed in the widely separated localities of Colombo, and Pt. Pedro in the neighbourhood of Jaffna, from which places I made frequent excursions into the jungle, for the purpose of collecting and observing the habits of birds and animals. The only parts I have left unvisited are Nuwera Elia and Batticaloa and their vicinities. In the former place Dr. Kelaart long resided and carefully investigated, as his list shows. From Batticaloa I have inspected small collections of birds; and the only part of Ceylon entirely unknown to either of us three is the Park country, which I had hoped to explore, but was pre-

vented by the malady which has caused my return to England. I may add, I have never admitted the *native* name of a bird, until, by repeatedly questioning different and unconnected parties, I have assured myself of its correctness. The classification and nomenclature I have adopted from Dr. Gray's Catalogue of the Birds in the British Museum, and the identification of the specimens has been made by my kind friend Mr. Blyth, of the Hon. East India Company's Museum in Calcutta.

The list numbers upwards of 300 species, and will be succeeded, if you approve of it, by a similar list of the terrestrial and fluviatile Mollusca.

1. AQUILA BONELLII, Temm.

This eagle was procured by R. Templeton, Esq., R.A., several years ago, and I do not know from what part of the island it was obtained. It has not fallen under my notice, nor has Dr. Kelaart enumerated it amongst his acquisitions at Nuwera Elia; I can therefore say nothing of its habits.

2. AQUILA PENNATA, Gmel.

I shot the only specimen of this small eagle yet seen in the island, on an open plain near Pt. Pedro. I was awaiting the return of my carriage from Warrany, and took shelter from the heavy morning dew (it was scarcely daylight) under an old Bortree (*Ficus religiosa*), when my attention was caught by the evolutions of what I took for an immature specimen of our common fish hawk, *Haliastur Indus*. It struck me the flight was *rather* different, but this I attributed to the darkness of the hour. Suddenly it pounced upon a bulbul roosting in an oleander bush: this at once undeceived me, and as it rose with its victim in its claws, I fired and brought it to the ground. It fought with determined spirit and kept a small terrier at bay, till I killed it with the butt-end of my gun.

3. SPIZAËTUS NIPALENSIS, Hodgs.

Dr. Kelaart procured this noble bird near Badulla, at an elevation of some 4000 feet. I know nothing of its habits, as it never fell under my notice.

4. SPIZAËTUS LIMNAËTUS, Horsf.

This species is common and widely distributed. I have shot it at Hambantotte, Matura, Colombo, Pt. Pedro, and in the Anooradapooru Wanny; I have also observed it at Ratnapooru and Ambegamoa, and Dr. Kelaart obtained it at Nuwera Elia. It is a bold and daring bird, striking fowls before the doors, even

of European houses, and in one instance I knew it to enter a verandah. I had wounded a fine adult specimen of the little common *Accipiter badius*, and desirous of preserving it alive, chained it to a post in the deep double verandah of the old Magistracy at Pt. Pedro. This bird had become quite tame, when one morning going into the verandah to speak to a friend who sat there sipping his coffee, I found my favourite in the claws of the Crested eagle. The spoiler fixed his eyes upon me, and merely tried to draw his prey further away, but this the chain prevented. He then raised his crest as if to intimidate us; I hastened into the house for my gun, my friend still looking on, and when I returned to the verandah the eagle was still there. I aimed at him, but the gun hung fire, and he escaped, but not till he had nearly devoured his own kindred,—a practical refutation of the old saw, that “hawks will not pick out hawks’ een.” There is a singularly dark variety of this species, which I have only seen at Pt. Pedro, and that but very rarely.

5. *ICTINAËTUS MALAIËNSIS*, Rein.

Dr. Kelaart procured this species at Nuwera Elia, and Mr. Mitford sent me a specimen from Ratnapoora. I subsequently saw it at Gillymally at the foot of Adam’s Peak, and if I mistake not, I also observed it on the wing in the “Pasdoom Corle.” It is certainly a mountain species, and I should say not uncommon, but I know nothing of its œconomy.

6. *HÆMATORNIS CHEELA*, Lath. *Cudoombien*, Mal.

Abundantly and widely distributed throughout the island, this fierce and gloomy tyrant of the woods lies in wait for its prey in the gloaming, scaring the herd-boy from the tank side, or the lonely native threading his way through the jungle, by its doleful moanings. By many it is considered equally ill-omened with the dreaded *Ulama*, whose shriek is deemed the precursor of death by the superstitious native. *H. Cheela* frequents the borders of tanks and morasses, feeding on frogs, snakes, lizards, and occasionally, I suspect, on mud-fish. Concealed in the dark foliage of some overhanging tree, it heedlessly marks the smaller frogs approach the grassy margin of the pool. Suddenly the large green bull-frog (*Rana Malabarica*) uplifts its head and utters its booming call. The *Cheela* is now all attention—with outstretched neck it fixes its glaring eyeballs on its desired prey—lower and lower it bends; for the frog, which has now reached the sedges with a croak of triumph, gains a log. But a shadow glides over him—in vain he crouches—and his colour becomes a dull brown, so closely resembling the log, that human eyes would

take him for a knot in the decaying timber ; with noiseless rapidity the barred wings pass on, and the log is untenanted. Fast clutched in the talons of his merciless foe, the frog is borne to the well-known perch, and a sharp blow on the back of the head from the bill of the bird deprives it of life. *H. Cheela* builds its nest in the recesses of the forest, or lofty trees. The structure is a mass of sticks piled together and added to year by year. The eggs, generally two in number, are 3 inches in length by 2 in diameter, of a dirty chalk-white, minutely freckled at the obtuse end with black dots.

7. *HÆMATORNIS SPILOGASTER*, Blyth.

This new *Hæmatornis* was sent to Mr. Blyth both by Dr. Ke-laart and myself about the same time ; the Doctor procured his specimen at Trincomalee, whilst I killed mine in the Wanny. I afterwards shot another pair at Pt. Pedro. I presume they are migratory like *H. Cheela*, which visits us in the north about March and leaves in July. All the specimens were shot in one year. I know nothing of their œconomy.

8. *PONTOAËTUS LEUCOGASTER*, Gmel. *Cadal ala*, Mal. ; lit. Sea Eagle.

The " fish eagle " is not uncommon, but local, the same pair frequenting the same eyrie year after year, and adding to its nest every breeding season, until a vast accumulation of sticks in some aged Bo-tree reveals the roosting place of the adult birds : to this they nightly repair. During the season of incubation the female is very fierce, defending her nest vigorously against intrusion. The superstitious fears of the natives also operate in her defence, as the sanctity of the tree (always dedicated to some dæmon) prevents any adventurous youth from climbing it even for pecuniary reward. The flight of this species is noble and imposing : poised high over the resounding surge it wheels above on circling pinions, and with extended neck surveys the finny tribes. Here, shoals of beak-nosed fishes swim in their seasonal migrations along the coral reef ; there, brilliant *Chætodons* float in the shallows. The tide has partially receded, and the water lies in still crystal pools in the depressions of the reef : over one of these the fish eagle passes : an abrupt wheel shows his attention arrested, a moment's pause, and down he plunges, his body swaying to and fro. The surface is reached, the legs suddenly thrown out, and with exulting cries he soars aloft, bearing in his talons a writhing snake, eel or large fish. The efforts of the bird to secure its prey in a proper position are now curious. If a fish is captured, the feat is comparatively easy ; the talons of the

hawk are gradually shifted until one grasps the prey near the gills and the other near the tail, so as to bring the fish into line with its own body, thus offering the smallest surface for the impinging of the atmosphere. With a snake or eel the matter is more difficult, and I have often seen the prey free itself from its captor by its strong writhings; a bite, however, near the head destroys its power, and it is borne away dangling by the neck in the grasp of its destroyer.

9. PONTAËTUS ICHTHYAËTUS, Horsf.

I encountered this species in the Wanny, where a pair may be generally found located by any good-sized piece of water. I found many nests in such situations, but believe the season for incubation had not commenced when I visited the locality in April. The eyrie is usually on some towering monarch of the woods overlooking the tank where the parent birds find a sufficient store of fish, frogs, and snakes, for themselves and their offspring.

10. HALIASTUR INDUS, Bodd. *Chem prandu*, Mal.; lit. Red Hawk. *Brimalgumoitu*, Port.

Common along the whole seaboard of the island, particularly at the mouths of rivers, and in estuaries, preying on carrion, for which it contends with the crows and the black kite (*Milvus ater*); I have known it to seize a fowl, but this is an unusual occurrence. They build in the vicinity of water, making many false nests in the same tree before they finally fix upon one which pleases them; and whilst the female is incubating, the male occupies one of those first made. The nest, like that of *Blagrus leucogaster*, is composed of sticks and twigs without any lining. Eggs about 2 inches in length by $1\frac{1}{2}$ in diameter, colour dull dirty white, dotted at the thick end with bloody-coloured, unequal and uncertain small blotches and spots; in some instances these spots are nearly black, resembling dry blood. The young, of which there are generally two, are excluded about the first week in February, incubation lasting about three weeks. Before the appearance of their feathers they are covered with a grayish down, and apparently fed with soft reptiles.

11. FALCO PEREGRINUS, Linn.

This bird is doubtless very rare; the only three specimens procured I shot in January, on the open plains near Wally Bridge in the Jaffna district. I found them breeding in a palmirah tope on the left-hand side of the road from Jaffna to Pt. Pedro; the nest, a rough structure of sticks laid on the dead "*matties*" or fronds of the palmirah, from which the leafy parts had been cut

away. They feed on the small waders which frequent the borders of the salt pans. I shot the first specimen (a male) early in the month, but the female was so shy, that though I long remained concealed near the nest, she never afforded me a shot, and I was obliged to return home without her. I was surprised to find another male on the same nest when I revisited the spot at the end of the month, and procured both him and his mate with a double shot.

12. *FALCO PEREGRINATOR*, Sund.

I was sitting late one evening in a native hut in Gillymally, at the foot of Adam's Peak, when Muttoo (my factotum bird-stuffer, hunter, and horsekeeper) came to tell me that a huge swift (*Acanthylis caudacuta*) which I had long desired to procure was sitting on a leafless tree crowning the summit of the hill, under which the hut was built. Hurrying out with the guns, Muttoo and I were about to scale the hill, when I saw something fall from the perch on which sat the bird, which I also mistook for a swift, so much did its wings overlap its tail. I directed the telescope, which I always carry, towards the bird, and to my surprise, the hour being so late, perceived a hawk (entirely new to the Ceylon fauna) devouring a small thrush. By this time Muttoo, unperceived, had approached within gun-shot of the lovely bird, and I saw the long barrel of my collecting gun slowly emerge from a favouring bush: an instant and the deadly tube was steady, the next its tiny flame burst forth, and ere the ringing report died away, the bird lay dead at the foot of the tree. This is the only instance in which the bird has been seen in Ceylon.

13. *TINNUNCULUS ALAUDARIUS*, Briss. *Wallooru*, Mal.

This bold little hawk is common throughout the island on all open plains dotted with jungle. They generally hunt in couples, sometimes skimming low over the bushes or along the ground and darting on their prey, sometimes hovering in the air and pouncing down on the larks, amadavats, and the other small birds on which they feed. I never found the nest of this species, although so abundant.

14. *HYPOTRIORCHIS CHICQUERA*, Shaw.

I saw this pretty hawk in the flat country near Pt. Pedro, but could not get a shot at it. I cannot, however, be mistaken in the bird, as I long watched it with my telescope.

15. *BAZA LOPHOTES*, Temm.

This bird, though rare in Ceylon, appears to be widely distri-

buted, and to feed on various substances. I shot one at Jaffna with half a lizard, *Calotes viridis*, in its maw, and Mr. Mitford procured another at Ratnapoora feeding on bees, which it captured sometimes on the wing and sometimes by darting at the nest. It was attended by its mate, and the two sat together on the dead branches of a tree, raising and depressing their crests.

16. MILVUS GOVINDA, Sykes. *Para prandu*, Mal., lit. Pariah Kite; and *Calu prandu*, Mal., lit. Black Kite, in contradistinction to *Chem prandu*, the Red Kite, *H. Indus*.

The greatest resort of this species is the estuary ignorantly called the "Jaffna Lake," and the shallow bay of Calpentyn. On the large extent of mud left bare by the receding tide, the "black kites" of Europeans find abundance of genial food, consisting of all kinds of dead fish, mollusca, and decaying animal matter, which they seize with their claws, darting from a great height. Nor do they confine their attention to the lonely seashore. Fighting with the pariah dogs, they play the part of scavengers in the filthy native towns, and early in the morning before the streets are tenanted they earn an *honest* livelihood. They are, however, bold enough to make frequent depredations on the fish-stalls, and in one instance I saw a lad about thirteen years old struck to the ground by the sudden pounce of a kite, who bore off a good-sized fish from a basket the boy was carrying on his head.

But their great feast is when the returning fleet of fishing-boats are lightened of their scaly cargo, or when the well-filled nets are drawn on shore. High overhead with quivering cry sail the "black kite," its usual companion the "red kite," and often the "sea eagle," *Blagrus leucogaster*; below, the beach is strewn with fish, crabs, turtle, cuttle-fish, &c. As the fishermen unload their boats, naked urchins catch up perhaps a gaudy *Chætodon*, or perhaps a strangely-shaped fish with an under jaw projecting far beyond the upper; the pariah dogs prowl about and steal a piece of shark, or nip off the head of a cat-fish; whilst the kites now rising, now falling, cull their favourite morsels in the way of Cephalopods and garbage of all kinds. I have often watched some fifty or sixty thus engaged, when the smell of fish drying in the sun for native consumption, the vociferations of the natives, and the quarrelling of children and dogs, rendered the scene one never to be forgotten.

The black kite builds in similar situations to the red kite, and lays two eggs of a rather rounder form, marked with a band of minute brownish freckles, the band occurring sometimes at one end, sometimes at the other.

17. ELANUS MELANOPTERUS, Daud.

This bird is uncommon, and but two specimens have been seen by myself or my hunter. The first I saw near Pt. Pedro and fired at it several times with dust shot, unluckily without effect; the second Muttoo killed on the Perth sugar estate on the Caltura river: he described the bird as frequenting the fences and stumps of felled trees in the cleared land. He observed it on several days in the same locality before he finally secured it. When shot, though severely wounded, it fought with great determination.

18. ASTUR TRIVIRGATUS, Temm.

This bold and daring bird is apparently confined to the mountainous country, where it is common, waging a destructive war against the hen-roost, unscared by the guns of Europeans and natives, who alike join in efforts to subdue it, and rarely falling a victim from its wariness and the swiftness of its attack. If the luckless hen but leads her mottled brood a short distance from the shelter of the yard in search of white ants or tempting grasshoppers, down swoops the "hill chieftain" from some towering tree or beetling rock, and despite the fury and resistance of the faithful mother, rendered fiercer by despair, the foe generally carries off one, if not two, of her family. It breeds in the holes and crevices of precipitous rocks, and when the young are captured early they are trained as hunting falcons and highly prized, selling for a large sum; I saw one at Anooradapoorra in the possession of a native, who refused 3*l.* for it, though its training was not completed. By way of hoodwinking it, its master had sewn up the eyelids, running the thread through them, so as to draw the edges together at pleasure.

19. ACCIPITER BADIUS.

The "*sparrow-hawk*" of Europeans is very common and widely distributed, feeding on small reptiles and birds. It has a pleasing winnowing flight, and sometimes ascends to a great altitude. I have often watched three or four wheeling round each other, ascending in circles, till the eye could scarcely follow them as minute specks in the clear æther.

20. ACCIPITER NISUS.

Included by Dr. Kelaart in his Catalogue of Ceylon birds (*sed non vidi*).

21. CIRCUS SWAINSONII.

Not uncommon on open plains, frequenting paddy fields and moist places in search of reptiles of all kinds, on which it feeds.

22. *CIRCUS CINERASCENS*.

Abundant in the same localities as the preceding, and often mistaken for it on the wing. Its chief food consists of snakes, which it seizes in its claws in its low skimming flight. The prey, clutched as often from the water as from the land, is grasped by the neck and bitten across the head.

Nothing can exceed in gracefulness the flight of this bird when beating over the ground in search of its quarry. Its long pointed wings smoothly and silently cut the air; now raised high over its back, as the bird glides along the furrows; now drawn to its sides, as it darts rapidly between the rows of standing paddy; now the wings beat the air with long and even strokes, and now extended, they support their possessor in his survey of the marsh over which he is passing. Suddenly he drops, and after a momentary halt speeds away with a snake dangling in his talons to some well-remembered stone or clod of earth, and commences his repast. I am sure these two species migrate, appearing with us about the end of the paddy harvest in great numbers. Though some few remain all the year round, I never ascertained that they bred in Ceylon, though we generally see more young than adult birds.

23. *CIRCUS MELANOLEUCOS*.

The only specimen I ever saw of this bird I shot several years ago, whilst journeying over an open plain near the village of Mantotte, on the western coast. I therefore know nothing of its habits. Mr. Mitford, the District Judge of Ratnapoora, has figured it amongst his spirited and truthful drawings of birds procured near that place. The bird was brought to him by a native.

24. *ATHENE CASTANOTUS*, Blyth. *Punchy bassa*, Cing.; lit. "Small Owl" (the name for all Owls is "*Bassa*" in Cingalese).

This handsome little owl was not uncommon last year in the neighbourhood of Colombo, but for nine years previously only one specimen had been procured. I also found it at Ratnapoora and Gillymally. Its hoot is not unlike the cry of the cuckoo, though more shrill and abrupt; indeed when I first heard it one morning, I thought it was the note of our annual visitor the European cuckoo. It hoots as late as 9 or 10 o'clock in the morning in shady situations; is silent during the heat and glare of the day, but begins again at 4 or 5 P.M. It is most on the alert during moonlight nights, feeding on coleoptera and geckoids, securing the latter while creeping up the bark of trees, seizing them in its claws. The natives tell me they breed in

April and May, nestling in hollow trees and the crevices of rocks. The iris of this species is red-brown, and it sees very clearly by day, being even then most difficult of approach.

25. *ATHENE SCUTELLATA*, Raffles. *Punchy bassa*, Cing.

Like the preceding, this species was either very rare, or curiously eluded the observation of both Dr. Templeton and myself for a long period; indeed I was nearly eight years in Ceylon before I saw a single specimen. One brilliant moonlight night, however, in November last, I heard as I supposed the lowing note of the "*bronze-winged pigeon*" (*Chalcophaps indicus*); thinking it very unusual at this time of night, I stopped my buggy to listen. Muttoo, too, heard the sound and declared it was a dove; but a second call undeceived me, though Muttoo still averred it was "*praa chattam*" (dove's noise). As I was dressed too conspicuously in white, I gave him the little gun and desired him to shoot the bird in question, promising sixpence if he succeeded. Muttoo slipped off his syce's dress and plunged into the cinnamon bushes, where I soon heard him imitating the call; on this the bird flew to the tree where Muttoo was concealed, and he, seeing where the bird alighted, fired and killed it. On dissection it proved to be a female with the ovaries distended with eggs, consequently I imagine the breeding season was near; the stomach contained remnants of coleoptera only. Most of our nocturnal birds of prey are insect-feeders; indeed this is not surprising from the great rarity of small mammals; they are never seen, as in England, hunting over the meadows in search of field-mice, shrews, &c. The irides of *A. scutellata* are dark greenish yellow.

26. *EPHIALTES SCOPS*, Linn.

Included by Dr. Kelaart in his list of Ceylon birds (sed non vidi).

27. *EPHIALTES SUNIA*, Hodgs.

Procured at Nuwera Elia by Dr. Kelaart.

28. *EPHIALTES LEMPIJII*, Horsf. *Punchy bassa*, Cing.
Motu, Mal. *Koorooi*, Port.

Very common and widely distributed. I have killed both varieties in Jaffna, Kandy, Colombo, Ratnapoora, and Hambantotte. During moonlight nights it hunts about blossoming trees for coleoptera, which it catches by darting at them passing and repassing, or resting on the leaves and flowers. Their cry when at rest is a monotonous and melancholy "*wāgh wāgh*;" when flying it is changed to "*wāh-hā wāh-hā*," quickly uttered

and mingled with a tremulous cry. It breeds in February, nestling in hollow trees, and laying from two to four roundish white eggs.

29. KETUPA CEYLONENSIS, Gmel. *Baccamooney*, Cing.
Oomuttanloovey, Mal.

These large owls are common through the island, both in the interior and on the sea-coast. They feed much upon fish, which they catch in the shallow mountain rivulets during moonlight nights. I have several times had them alive, and they devoured fish with avidity. When alarmed during the day, they utter a loud hissing note subsiding into a low growl; during this time the throat is much inflated at the white spot. I hear that they breed in hollow trees and clefts of rock, laying two large white eggs.

30. SYRNIUM INDRANI, Gray. *Oōlama*, Cing.

Inhabits dense and lonely jungles, and utters the most doleful cries, which the natives (a very superstitious race) consider the sure tokens of approaching evil.

31. STRIX JAVANICA, Gmel.

The only locality in Ceylon for this bird is the pretty fort of Jaffna. Here several pairs may be nightly seen perched on the gables of the old Dutch church, or on the dilapidated bastions of the walls. They feed much on fish, which they capture in the shallow water of the estuary commanded by the fort.

[To be continued.]

XI.—On the *Rissoa rubra*. By WILLIAM CLARK, Esq.

To the Editors of the Annals of Natural History.

GENTLEMEN,

Exmouth, June 26, 1853.

IT is stated in a paper of mine on the *Rissoæ* in the 'Annals,' vol. x. p. 262. N. S., "that the *R. rubra* is very common alive in certain localities, and that I have never seen the animal, and can scarcely believe it to be a true *Rissoa*, as the semitestaceous operculum and its apophysis are more like those of a *Chemnitzia*."

This view is corroborated by the reception this day, by favour of Mr. Barlee, of many lively specimens sent from Penzance in a bottle of sea-water by post, which has enabled me to get notes of all the organs. I am not aware that this curious, I may almost say, anomalous species, has ever been mentioned beyond a very slight notice by one or two authors, which in most respects



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