

tis: macula mystacali coccinea: long. tota 12·0, alæ 6·0, caudæ 4·0, rostri a rictu 1·4.

Fœm. *Macula mystacali nulla.*

Hab. Peruv. orient. Yurimaguas (*Bartlett*).

We have already alluded to the existence of this species in our notes on the true *Celeus jumana* (Spix)*, with which it has hitherto been confounded. It is perhaps, however, strictly more nearly allied to *Celeus citrinus* than to *C. jumana*, having the under wings and underside of the primaries entirely unspotted, as in the former species.

Slater has a male specimen of this bird in his collection marked "*Celeus citreopygius*, Bp. MS.," which we accordingly adopt as its specific name. Malherbe's figure 1 (pl. 55) looks very like the present bird; but in his figure 3 and letterpress he clearly indicates the barred under surface of the primaries, which does not exist in this species†.

(180.) *UROCHROMA HUETI* (Temm.).

Psittacus hueti, Temm. Pl. Col. 491.

Urochroma hueti, Bp.

We were not previously acquainted with the true habitat of this beautiful species.

† (189.) *MICRASTUR MIRANDOLLII*.

Astur mirandollei, Schlegel, Ned. Tijdschr. i. p. 130, et Mus. d. P.-B. Astures, p. 27.

Micrastur macrorhynchus, Pelzeln, Reise d. Novara-Exp. Vögel, p. 11.

A single skin (marked female) from Chyavetas appears referable to this recently described species. Slater has lately seen in the Musée des Pays-Bas the typical example of Schlegel's *Astur mirandollei*, and has little doubt of its identity with Pelzeln's *Micrastur macrorhynchus*, a mounted skin of which, received from the Vienna collection, stands beside it. The present example agrees well with Pelzeln's description.

12. Notes on the Panolia Deer or Thamyn (*Cervus eldi*).

By Lieut. R. C. BEAVAN, C.M.Z.S.

Lieut.-Col. Blake, Commandant 9th Madras Native Infantry, has kindly furnished me with the following information concerning this Deer:—

"As regards the exact localities of the 'Thamyn,' I can only say

* *Antea*, p. 586.

† I have examined Malherbe's type-specimens of his *C. jumana* since the above was written, and found that one of them belongs to the true *C. jumana*, and the other to *C. citreopygius*. These specimens are now in the collection of M. Turati of Milan.—P. L. S.

where I have found them and where not. As far as I know they do not occur to the south of Moulmein; but from within a short distance of Thabyoo Point, the south-western headland of the Martaban district, to Sittang, bounded to the eastward by the forest line, they are found in large herds. Again, on the opposite side of the Sittang River, to the south and west of Pegu, they are also found in large numbers. How far they extend in a westerly and northerly direction, from the mouth of the Rangoon River, and in the Bassein district, I do not know; but I have heard that they are common even as high up as Munneepore.

"From Pegu to the north they are found in very small parties, the ground not suiting them until you cross the 'Koon' creek or river, the separating boundary between the Martaban and Thounghoo districts, and from this to within a few miles of Thounghoo they occur in large herds.

"Sometimes the plains or open spaces between the 'Eng*' forests will be covered with them, and three or four hundred may be seen at one time. Under these circumstances they are shy and very difficult to approach. Strange to say, although the ground appears quite as favourable for them, I have never seen a single one to the eastward of the Sittang River, north of Sittang. From the above you will see that in habits they are gregarious. During the night and early morning and evening they frequent the plains, and where the forest jungle is not distant they retire into it during the heat of the day.

"Their food, I imagine, consists of grass. I cannot call to mind having seen more than *one* fawn with its mother.

"The colour of the young, as well as that of the females, is what is termed light fawn-colour. The males are sometimes of the same, and sometimes as dark as the male of the Sambur (*Cervus hippelaphus*). I know not if any change takes place in their coats with the change of seasons."

Colonel D. Brown, Officiating Commissioner at Moulmein, has noticed them to range along both banks of the Irrawaddy, on the proper right bank up to Meanoung, and on the left bank as far as Meaday on the British frontier, N. lat. 19° 40', E. long. 95° 20' (approximately). He has also observed them as plentiful at Theegwen near Bassein, a few at Padoung opposite Prome, and more sparsely scattered through the Thanawaddy district.

For most of the following information I am indebted to the courtesy of J. Davis, Esq., Superintendent of Police in the Martaban district, an officer well known for his intimate acquaintance with the Burmese language; hence his services as interpreter were invaluable when Burmese and Karen shikarees had to be questioned.

Pioneered by him, early in October last, I visited the haunts of the Thamyn near Thatone (a town about forty miles north-west of Moulmein); and although, owing to the dense nature of the vegetation covering the plains at that time of year, I was only able to see

* *Dipterocarpus grandifolia*, Wall., "Wood-Oil-tree," Mason's 'Burmah,' edit. 1860, p. 493.

a few scattered females and young of the second year, yet the insight thus afforded into their habits and economy more than repaid me for the severe attack of illness I subsequently incurred by exposure to the heat and wet.

This plain of Yengyaing was then, owing to recent and heavy falls of rain, one large swamp. Nearly the whole of its unbroken extent, which embraces an area of fourteen miles in length with an average breadth of ten, could be traversed in a small canoe, except here and there where mud and vegetation combined obliged one to resort to a very unpleasant system of half wading in water and half sticking in deep slime. A continuation of this plain, broken here and there by belts of jungle, extends for several hundred miles up the Burmese coast, and has evidently been formed by the gradual retirement of the sea, which at one time doubtless dashed its waves against the Martaban and other continuous ranges of laterite hills. It is now, at Yengyaing, some eight to ten miles distant from the hills, and seems to be still retiring, since the water along the coasts of the Gulf of Martaban is very shallow, and studded here and there with sand-banks. For the primary cause of this we may doubtless look to the immense amount of silt brought down by the waters of the Salween, Beeling, Sittang, and Rangoon rivers, all of which discharge themselves into the Gulf of Martaban. As the sea retires, a belt of mangrove-jungle, about a mile in width, appears to travel with it, and the plain is thus enclosed by a barrier of vegetation on one side and the mountains on the other. This strip of mangrove-jungle gives cover to numberless Hog-deer, Tigers, Leopards, and Pigs, but is never entered by the Thamyn, except where somewhat open; nor on the other side do they ever attempt to penetrate into the mountains. The plain is intersected by numerous tidal creeks, which, in the hot weather, when deprived of water from the hills, appear to dry up to a great extent; and those still open at that time of year contain no admixture of fresh water, so that it is evident that for two, if not three, months in the year the Thamyn must be entirely deprived of fresh water*; whilst during the rainy season, for six months at least, they may be said to live in water. It appears wonderful how they can manage to exist in such extremes of heat and wet.

With the exception of a few stunted trees here and there, and a fringe of *Hibiscus* bushes along the creeks, the plain is covered with nothing but grasses and paddy, of which latter both the wild and cultivated varieties are abundant. Owing to the paucity of the population and the consequent demand for labour in this immediate neighbourhood, perhaps only one-fourth of the whole area is under cultivation for paddy; the crop succeeds here admirably, and the grain forms one of the staple articles of export from Moulmein and other Burmese ports.

The remaining three-fourths is covered with the indigenous uncultivated plant, which in seasons of scarcity is reaped and used for food. This forms a vast grazing-ground both for the Thamyn and

* The Burmese assert that during this period the animal drinks urine!

for large herds of tame Buffaloes, which are during the rains pastured here by the Karens, but withdrawn into the heavy jungles near the hills when in April and May the whole of the vegetation on the plain becomes parched up and devoured by jungle-fires.

At the time of my visit vast flocks of waders and other water-birds were arriving from the north, and the creeks were filled with Pelicans of several species, whilst the mud-flats absolutely swarmed with Stints, Sandpipers, Egrets, and especially the Rosy Tantalus. Here and there, stalking gravely amongst the flowering paddy, might be seen pairs of the Siris Crane (*Grus antigone*), or a troop of Adjutants, both of which birds breed in the neighbourhood. Occasionally the rarer Javan Adjutant was met with, and the Jabiru Stork (*Mycteria australis*).

The rutting-season of this Deer commences in the middle of March, and lasts throughout April to the middle of May. The female gestates nearly seven months, and brings forth her young amongst the jungle-paddy in October and November, the paddy being then flowering or in seed and at its greatest height. The female has only one young one at a time, which frequently stays with its mother until the second year*. The females have only four teats. In colour they are much like the female Sambur, but perhaps a little lighter. The young are at first spotted or menilled, but these markings disappear with age. The females are hornless. Both sexes begin to breed at about eighteen months old. The young males first begin to acquire horns in the second year†. After two years they get two tines, and when about seven years old are in their prime, with twelve tines (including the brow-antler). The colour of a full-grown buck is dark brown, especially about the back and neck, with underparts lighter. As far as I can ascertain there is no trace of a mane; and the texture of the coat varies considerably with the seasons. More exact information on these points is, however, needed.

The natives have a vague idea that two distinct species, "the lesser and the greater Thamyn," are to be found in the same herds, distinguishable only by differences of the size of the horns and of colour; but this of course is to be accounted for by the individual distinctions common to all races of animals. The horns are perfectly developed in March, and shed in the middle of the rainy season—that is, about September.

The average weight of the male is from 50 to 60 viss‡, that of a female 40 viss. Four men can carry a male with ease when disembowelled and quartered§. The male averages $3\frac{3}{4}$ feet in height at the shoulder; the female a little less. The very largest males do not exceed $4\frac{1}{2}$ feet in height.

The flesh is much liked by the Burmese, and always finds a ready sale in the neighbouring villages. The Karens, however, will not

* The mother will breed a second time eighteen months after bringing forth, so that the young of two seasons are not unfrequently seen with their parent.

† As noticed above by Blyth, on Major Tickell's specimen at Moulmein.

‡ A viss is equal to 140 tolahs.

§ As noticed by Blyth, the Burmese always quarter deer with the skin on.

eat the meat, because they think it will bring on cholera. It is rarely brought into Moulmein. In the country the wholesale price* of a doe is rupees 3, a buck is rupees 4, which is of course less than the usual retail bazaar rate. The flesh is said to smell a little about the end of March, when the weather is very hot; it is best for food about November and December.

The range of the Panolia Deer, according to Mr. Davis, is as follows:—In the Martaban district they inhabit exclusively the open grassy plains between the sea and the mountains. In the Pegu plains they are perhaps more abundant than in any other part of Burmah; next to these the Yengyaing plain in Martaban produces most; near Rangoon they are found in the Dallah plain. About Pegu and Yengyaing they are found in herds of from fifty to a hundred in the month of March; but when hunted they congregate much more, and as many as two hundred may then be seen together. In habits they are essentially gregarious, and associate with no other species, although Hog-deer abound in the grass and jungle along the edges of the plain; nor will they allow the tame Buffaloes to come nearer to them than about 100 yards. In habits they are very wary and difficult of approach, especially the males. They are also very timid, and easily startled; the males, however, when wounded and brought to bay with dogs get very savage and charge vigorously. On being disturbed they invariably make for the open, instead of resorting to the heavy jungle like Hog-deer and Sambur. In fact the Thamyn is essentially a plain-loving species; and, although it will frequent tolerably open tree-jungle, for the sake of its shade, it will never venture into dense or matted underwood—*i. e.* “bush-jungle,” in contradistinction to “tree-jungle.”

Indeed I was credibly informed of a large stag which, being driven into a corner of the plain last year by herd-boys with pariah dogs, and finding no means of escape, took refuge in heavy jungle, where its horns got entangled in an *Hibiscus* bush, and so was actually captured alive. Its captors, however, soon put an end to its existence with a sharp “dhar.”

When first started the pace of the Thamyn is great. It commences by giving three or four large bounds like the Axis or Spotted Deer, and afterwards settles down into a long trot, which it will keep up for six or seven miles on end when frequently disturbed. This is when the vegetation on the plain is comparatively short. In the rains they do not go far before they find a hiding-place in the long paddy. Their powers of leaping are highly developed. On the Yengyaing plain alone there are at the present time about a thousand head, on the Thatong plain, a little further to the north-west, perhaps a hundred head only, which go about in small herds of seven and eight. At Yengyaing the annual number killed amounts to about forty-five, including those bagged by Europeans; and about five natives gain their livelihood in that place almost entirely by the sale of its flesh. They are least gregarious in the rainy weather. The females have mostly then retired in twos and threes into quiet

* The price quoted is what a shikarry usually expects to realize.

spots, and the herds are altogether more scattered, owing to the increased density of the vegetation.

They feed both during the day and night, chiefly in early morning and evening. Their food consists principally of jungle-paddy; during the night they do a great deal of damage to the cultivated variety, treading down more than they eat. They also feed on grass, and the leaves of two jungle-trees called in Burmese the "*keay*" and the "*thameh*," the scientific appellations of which I am unable to resolve. In a tamed state they will eat plantain-leaves.

The call of the female uttered when disturbed is a short barking grunt, that of the males is louder and more prolonged. It is most frequently heard in the rutting-season, during which period the males have frequent and severe battles. A pair have been known to have been captured whilst so engaged with their antlers interlocked.

About the end of January the first jungle-fire sweeps over the plain and destroys the dry herbage, leaving small patches here and there about the edges of swamps. The second burning takes place about the end of March, and leaves scarcely a blade of grass behind it; the plain is then almost entirely bare, and the deer, having no cover, congregate in large herds. They are then to be seen on all sides, and, the Buffaloes having previously been withdrawn to the tree-jungle, are left alone in their glory, and, as noticed before by Colonel Blake, become at this time excessively wary. From the middle of February until the first showers fall at the end of April they apparently subsist without water; they lie in the salt-swamps during this period, and get the benefit of heavy dews at night.

Their only enemy appears to be man; but an epidemic occasionally breaks out amongst them and destroys large numbers. The last occurred in 1863, and some fifty or sixty head fell victims. The cause of this murrain is unknown; it is probably analogous to that which yearly in Burmah, during the rains, causes such havoc amongst domestic cattle. The Burmese readily eat the diseased flesh, and experience no bad effects from doing so. The disease attacks old and young alike, apparently, causes great emaciation and loss of strength, and the animal at last dies of pure weakness. It will probably be found to be some swelling or affection of the throat and lungs which prevents the animal from eating.

There seems to be no doubt that in Burmah this species is gradually decreasing, and will at no distant date be excessively rare. This can be accounted for by the gradual but steady increase in the population, and the greater area of country (which must naturally increase yearly) which is taken up for the cultivation of rice. Unfortunately for the Thamyn, the whole of their favourite *locale* is excessively well adapted to the cultivation of rice; and there is no doubt that where the indigenous wild plant is found there also the cultivated variety will flourish. The rice-trade of Burmah is yearly increasing in extent; and a few years bid fair to see the present haunts of the Thamyn not unlike the present state of the greater portion of the rice-producing plains of Lower Bengal.

*An intelligent Burmese shikarry, who has been a hunter from his

youth upwards and is now an elderly man, tells me that in former years, before Martaban was taken by the British, the Thamyn were much more abundant than they are now, and that the natives used to destroy them wholesale at battues. A large number of men would assemble from the surrounding villages, and gradually encircle three or four moderate-sized herds with long strings, upon which plantain-leaves were tied so as to flutter in the wind. The circle, originally formed at some distance, was gradually lessened as the deer, afraid to pass the scarecrows, got gradually driven together, until they were completely surrounded and at the mercy of the hunters. The object was to get them into a corner near the heavy jungle, into which, if they attempted to run, they either became entangled or allowed their pursuers to get up quite close. As many as 150 to 200, my informant tells me, he has himself seen killed in one battue in former years. To such a length was this system carried, and such enormous havoc was thereby created, that the Burmese Government, fearing the species would be utterly exterminated, wisely put a stop to the practice. This shikarry informed me that twenty-five years ago he has seen as many as 500 head in one herd; and his account was confirmed by others. At the present day vast mounds of their bones in every stage of decay exist on the Thatong plain, the site of many a battue in former times. The value of a whole carcass then was only 4 annas, or $\frac{1}{4}$ tical weight of Burmese silver, equivalent to 8 or 10 annas of our coinage at the present day! Several intelligent men are living now in the vicinity of Thatong and Yengyaing who formerly took part in these wholesale slaughterings, and, like many others of the present generation, are apt to look back fondly to those good old times.

These battues or kyówine were preceded by all sorts of ceremonies and sacrificial rites, offerings being previously made to ensure success to the tutelary nats or deities of the woods and plains.

In addition to these battues, and the recent increase of cultivation and population, we may account for their gradual decrease by the great increase that has taken place of late years in the number and use of firearms. Nearly every Burman can shoot, and a large proportion have each their matchlock or cheap gun.

It is excessively difficult to catch the Thamyn alive, even a young one, owing to the open nature of the country they frequent; and several officers in the Burmese commission have for some time past been endeavouring, without success, to procure young individuals of both sexes for the Zoological Society of London. Major Tickell, as narrated by Blyth, had one alive for some time in Moulmein; but it was eventually killed by pariah dogs, who got into its enclosure at night. My informant, the shikarry, tells me he had one also tame some years since. He caught it when about three months old, fed it on milk at first, afterwards on grass and plantain-leaves. After a short time it became so tame that it would follow its owner about, and never attempt to leave the dwellings of man. After an interval of two years it got a small pair of horns, shaped like those of the adult, but much smaller, and afterwards, like most

pets, met with an untimely end, being stolen and killed for food by rapacious Burmese officials. By this the species appears to be capable of easy domestication, although said by some invariably to pine away and die after capture.

The horns of the species are, if large, kept by the natives for making handles for sickles; if small, they are of no value, and either thrown away or cut up and used as pegs. As to medicinal qualities, when a buffaloe is bitten by a snake, the horn of the 'Thamyn ground to powder is mixed with a solution of the leaves of the "yekazon" (*Ipomœa*, sp.), or wild convolvulus, and given internally as a dose. It is said to cure the bitten animal immediately. No other part of the beast appears to be used medicinally, and the above-mentioned nostrum is of no avail for the human race.

13. Notes on the Myology of *Iguana tuberculata*. By ST. GEORGE MIVART, F.L.S., Lecturer on Comparative Anatomy at St. Mary's Hospital.

The muscles of Saurian Reptiles (in which group I by no means include the *Crocodylia*) have not hitherto, as far as I know, been described in any detail, and have scarcely at all been figured. Many facts have certainly been recorded by Meckel*; and Heusinger† has also published interesting notices (mainly referring, however, to those forms in which the limbs are rudimentary); but the greatest and most accurate record of saurian myology as yet accessible is that given in the second part of Professor Stannius's new edition of his 'Anatomy of the Vertebrata'‡.

It has been suggested to me that a series of notices, accompanied by woodcuts, of the main peculiarities presented by the myology of different oviparous vertebrates would be a not undesirable contribution to comparative anatomy; and I have now the honour of laying before the Zoological Society the results of my dissection of a fine specimen of *Iguana tuberculata*, for the opportunity of making which I am indebted to the rich stores of the collection of the Royal College of Surgeons, and to the kindness of my friend Mr. W. H. Flower.

A correct determination of Saurian muscles, especially those of the posterior extremity, is not to be hoped for in a first attempt. I have therefore thought it well to begin with the Iguana, because it is a common species, readily procurable, on which account my errors and misinterpretations will be the more easily rectified.

* *Traité général d'Anatomie comparée*, par J. F. Meckel: traduit de l'allemand par MM. Riester et Alph. Sanson (Paris, 1829): tome v. 1^{re} partie, et tome viii.

† In *Zeitschrift für organ. Physik*. Bd. iii. Hft. 5. p. 481.

‡ *Handbuch der Zootomie*, von Siebold und Stannius. Zweiter Theil. Die Wirbelthiere. Zweite Auflage. Zweites Buch. Die Amphibien (Berlin, 1856), pp. 100, 117, 122, 126, 133.