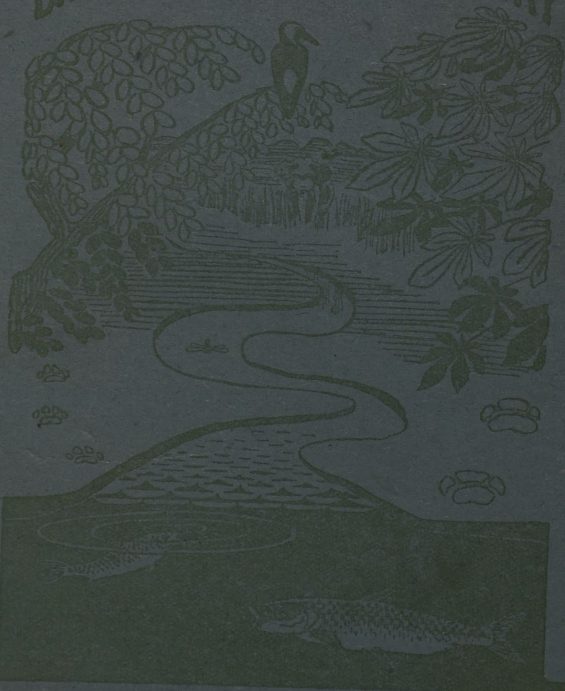


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VOL VII NO. 1

Issued June 1932.

EDITED BY C. M. INGLIS, F. Z. S., F. R. S., F. M. B. O. U.

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## Darjeeling Natural History Society.

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The Society was started about the end of 1923, the objects being to maintain the Museum in a proper condition; to promote the study of Natural History and to get together, as complete as possible, collections of Natural History specimens from a limited area, including "the civil districts of Jalpaiguri and Darjeeling and the State of Sikkim", as well as what could be procured from the neighbouring countries of Tibet, Bhutan and Nepal.

The Government and Municipal grants not being sufficient for our purpose, it was proposed to enrol members so as to increase our funds, and a Quarterly Journal has been started. It is hoped that everybody will join the Society and co-operate to make the Museum and Journal a success.

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The  
JOURNAL

OF THE

Darjeeling Natural History Society



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John Bale Sons & Danielsson, Ltd. London.

*UROCISSA FLAVIROSTRIS FLAVIROSTRIS.*

*The Yellow-billed Blue Magpie.*

*1/3 Nat. size.*

Journal  
OF THE  
Darjeeling Natural History Society.

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The Yellow-billed Blue Magpie

*Urocissa flavirostris flavirostris* (Blyth).

(With a coloured plate).

An account of this beautiful Magpie was given in *Vol. VI, No. 3, p. 89*. The bird from which the coloured plate was drawn was obtained at Rambh (7,000 ft.), about 6 miles from Ghum, on the 5th December 1931. It is shown  $\frac{1}{2}$  natural size. The cost of reproduction of this plate and three others we owe to the great generosity of one of our members, Mr. Walter Duncan (Editor).

Beebe. In his *synonymy* of which 6 are found in India and Burma and all the others, 26 in number, which include the 19 named by Oates, he considers to be wild hybrids. Blanford in the 1st edition of the *Fauna of British India* allowed 6 species and described 2 sub-species from India and Burma. In the 2nd edition of this work, Stuart Baker allows 5 species and 5 sub-species from the same area.

Only one of these is known to occur in our area, though it is possible that the Nepal bird may stray across.

Kalij Pheasants have long, usually disintegrated, crests, those of the hens being rather shorter. The face is bare and in the cock there is a lappet beneath it. The colour of this bare area is crimson.

Journal  
OF THE  
Darjeeling Natural History Society.

Vol. VII, No. 1.

Game Birds of Sikkim, including the Darjeeling District  
and of the Jalpaiguri District, Bengal,

BY

C. M. Inglis, F. Z. S., F. E. S., E. M. B. O. U.

(Continued from page 136 of Vol. VI.)

We have now reached the Kalij Pheasants, which include that well known aviary bird, the Silver Pheasant. It is still doubtful how many species and sub-species there are, especially of the Silver Pheasants and more especially in Burma. Of late years a good many species were named, mostly by Oates, who alone was responsible for the naming of 19 from Burma.

Beebe in his sumptuous monograph allows 9 species, of which 6 are found in India and Burma and all the others, 26 in number, which include the 19 named by Oates, he considers to be wild hybrids. Blanford in the 1st edition of the *Fauna of British India* allowed 6 species and described 2 sub-species from India and Burma. In the 2nd edition of this work, Stuart Baker allows 5 species and 5 sub-species from the same area.

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## (30). The Black-backed Kalij Pheasant.

*Gennæus melanotus* ( Blyth ).

The cock has the upper plumage black glossed with violet and edged with velvety-black; the shafts of the feathers are white; wing-coverts, secondaries and tail glossed with green; ear coverts and chin and throat unglossed black; the feathers of the breast are lanceolate (long and pointed), white in colour, brownish at the base; posterior abdomen and vent brown. Some fine cocks have very narrow white edges to the scapulars.

The cocks measure up to 25 or 26 inches and have tails up to over 12 inches. Weight up to 2 lbs. 12 ozs.

The bill is greenish-horny, darker at base and blackish round nostrils; iris hazel-brown; legs and feet pale horny-brown. There is generally one spur on each leg of the cock, though in a specimen sent us by Smyth-Osbourne each foot has a small sharp supplementary spur at the base of and below the ordinary ones.

In the hen the general colour is deep brown or in dark specimens blackish-brown edged with grey or white, these margins being very wide on the wing-coverts and lower plumage; face, chin and throat grey; quills brown; centre tail feathers rufous-brown, vermiculated with rufous; other tail feathers dark brown glossed with green.

Hens measure up to 21 inches and have tails up to about 8½ inches. Weight up to 2 lbs. 4 ozs.

In young birds the sexes are distinguishable, the cock being much darker and blacker, while the hens are browner and redder; the tail feathers of the cock are glossed with green and those of the hen are mottled black and chestnut or reddish-brown.

The chick in down has from crown to mantle rich rufous, the remainder of the upper plumage chocolate-brown with two buff stripes from scapulars to tail; a black line from the eye to the neck; lower plumage buffy-white tinged with rufous on the flanks; the wing-coverts broadly edged with buff.

The distribution of this Pheasant is given by Stuart Baker as:—"Sikkim; West into Nepal, probably to the Aran River; East to Bhutan". It occurs over a much smaller area than the other birds of this genus. With regard to the distribution in our area, it occurs from the plains level at 300 ft. up to 8,600 ft., where some were seen by J. L. Baker. The Sankos will probably prove to be the E. boundary but birds must stray into Assam, as a bird shot by Shebbeare in Goalpara

was a hybrid between this and the Black-breasted Kallj. Masson wrote that they were found as high as 10,000 ft. but this is doubtful and the highest of which we have any record is at Senchal (8,600 ft). Mr. Gent never found them above 8,000 ft. and said there used to be a party near the Rimbick bungalow at that elevation which remained there the whole year, but that they were commonest below 6,000 ft. They are common in the Tista Valley in the cold weather and may be resident. They may be seen in Darjeeling; we have on several occasions come across them on Birch Hill and one was shot between the Museum and the Convent. In the Duars they are fairly plentiful in places: we have seen them at Gorunara (300 ft). They remain all the year round. They are said not to go far from the hills but we have seen them at Lataguri, which must be about 16 miles from the foothills as the crow flies. In the hills they seem to like damp evergreen jungle near streams, ravines and hillsides wherever the cover is good; they are also often flushed from the tea. In the plains too they seem to like the lower lying humid parts of the forest. They feed during the morning and evening and may then be flushed from the side of the roads (we have put them up from the edge of the P. W. D. road running along the Tista Valley) or from the jungle paths. When flushed they rise with a sharply repeated *Kookri! Kookri! Kookri!* or *Koorchi-Koorchi-Koorchi*. Beebe says they are fond of murmuring to each other and also have a contented cluck, uttered when quietly feeding, also "when suspicion comes and a warning is intended, a series of these clucks is run together, ending with a loud, shrill screech or chirp....." Gammie says "when, however, the males are in the fighting humour—which they usually are about breeding time—their call, as they advance towards each other, is 'koo koo' 'waak waak', the former being the threatening and the latter the attacking note. They also sometimes answer each other's call in the jungle". The cock makes a drumming noise more often in the breeding season. Beebe says he "drums by quivering its wings through a narrow arc, between its sides and the level of its back, the sound resulting from the air rushing between the large flight feathers". A cock we saw called from the ground and made a whistling sound. They are, like Jungle-fowl, great runners and able to move quickly and silently through the dense undergrowth. When flushed from the hillside they make for the

nearest bit of forest, preferring to fly downwards but when flushed from the tea often fly up hill. As Stuart Baker says:—"Like all the Kalij Pheasants, it is a tremendous runner, and when worked with beaters only will seldom rise until it reaches the very edge of the forest or bushes, when it gets up with a rush and a flurry of wings, soon getting up a considerable pace. If flying downhill, it alternately sails and flies with rapid beat of wings until it sails out of sight....." If flushed by a dog they often fly into a tree. Masson wrote he had shot six in a day. He also shot five on another occasion while wandering along the Rangirun road with a dog.

Beebe gives an interesting account of the food of this Pheasant. He writes:—"There are few edible morsels which come amiss to the Black-backed Kaleege. Its food is varied in the extreme, and includes fruit, seeds and insects of all kinds. It will pursue flying grasshoppers and moths, and I have even seen them leap into the air after the little drab forest butterflies. Especially do they love the grubs and larvæ of dung insects and those which live in rotten wood, and they even swallow the small millipede pill-bugs, armour and all.....Yams are also a favourite article of diet, and the pheasants will often dig quite deep holes and trenches in the mould of open forest glades in search of these fleshy tubers. When they go into the small, field-like places along the edge of the forest, the Kaleegs find an abundance of seeds of weeds, grain, and other plants and, in addition, they eat the young tops of ferns and nettles, many kinds of berries, and the fruit of a *Polygonum* and a raspberry which abound in Sikkim.....A male bird shot in the late evening had been feeding exclusively on insects, all but one of which were moths. Among these were one large one (*Arcte caerulea* Guerrée), the remainder being smaller and of as yet undescribed species. With those was an enormous orange-headed wasp (*Vespa magnifica* Smith)".

They roost on the same place every night, several birds together, the young also roosting with the old birds, so their roosting places are easily discovered by the droppings on the ground. On going to roost the Kalij flies up into the tree, looks round in all directions, walks along a branch till a suitable place is found and settles down for the night.

Kalij Pheasants are bold. Once in Cachar I shot a hen and the cock came straight at me as if to attack but thought better of it.

Stevens says Martins do a lot of damage to the eggs and young birds. Eagles and the large Eagle Owl must also take toll of some numbers and Beebe mentions a nest of eggs destroyed by a bear.

The breeding season is from March to the end of June but eggs are also said to have been taken at the end of July in the upper limit of its range; the lower down it is, the earlier it breeds. With regard to this Stuart Baker says:—"In the lower elevations at which these Pheasants bred, say from 1,500 to 3,000 feet, March and April are the two months in which most eggs are laid; from 3,000 to 4,500 feet, the 25th April to end of May or early June are the favourite breeding months, whilst in the highest ranges they breed from May to the end of June or even July, and I have had hard-set eggs sent me which were taken in August below Darjeeling." They scrape a few leaves together or sometimes not even this but only those collected in a hollow which the bird presses down; favourite spots are thick undergrowth, ravines, dense forest, dense bamboos and also in tea gardens in the weeds below the tea bushes. The nests are always well concealed. Six to eight seems to be the usual number of eggs laid but ten has been recorded. Bailey saw a captive cock lifting up sticks and throwing them over its shoulder. Beebe writes:—"Unusually fortunate covies, including eight young, have been observed but two, three, or at the most four are the more usual number of survivors of the nesting perils". We saw a hen with seven chicks in May.

The eggs vary in shape, some being longer or broader than others and the colour also varies from pale cream to pale *cafe-au-lait* and rich coffee colour. The average size as given by Hume is  $48.5 \times 36.3$  mm.

They are not difficult birds to keep in captivity once one can get them to settle down after the first few days. Beebe writes:—"A number of Black-backed Kaleege were among the survivors of the large pheasant collection which was received in London in July 1857, and they bred in the gardens of the Zoological Society the following year. Since then this species has been reared in captivity many times in most of the large public collections and by many private individuals. Two rather remarkable crosses have been produced of this species with the Impeyan and with Reeves pheasant.....The period of incubation of the Black-backed Kaleege is about twenty-four days; of eight individuals confined in the London Zoo, of which a record has been

kept, the average length of life was three years and nine months, while the longest-lived Kaleege survived for a period of thirteen years and five months, this being the record for longevity for the whole genus".

Both O'Donel and myself have seen a Kalij Pheasant near Siyoke in the Kista Valley with white bars on the rump, as found in Nepal and Black-breasted birds, but other birds seen there have been the Black-backed species. The birds we saw may have been either the Nepal bird or hybrids. We give the distinguishing features of the Nepal Kalij Pheasant (*Gennæus leucomelanus* (Lath.) in case it is come across:—In the cock the crest is black as in our Sikkim bird and the upper plumage is glossed with steel-blue. The principal difference is on the rump, the feathers there being glossy blue-black with a solid fringe of white and the lanceolate feathers on the breast are not as white as in our bird.

The hen is very similar to that of the Black-backed Kalij. Beebe, writing about the latter bird, says:—"Fresh skins of this species show a very decided difference from the females of the Nepal Kaleege in the very pronounced melanism of the entire plumage. Whereas the latter would be described as rufescent, *melanonotus* is distinctly black.....In the vermiculations of the middle tail-feathers *melanonotus* has the red darker, more rufous and less buffy than in *leucomelanus*.....Then again in *melanonotus* the lateral tail-feathers are almost wholly unmarked greenish, lacking the paler vermiculation which in *leucomelanus* often extends over the margins of several pairs".

Stuart Baker gives the distribution of the Nepal Kalij Pheasant as:—"Nepal, as far East as the Arun River. I procured several specimens from Dhamkhata on the Tamra, which runs into the Arun. Nepalese traders at Pankabari and Jalpaiguri bring down this species for sale".

(To be continued)

## The Crow Family of our area.

BY

C. M. Inglis, F. Z. S., F. E. S., E. M. B. O. U.

*(Continued from page 141 of Vol. VI.)*

## [14. The Large Spotted Nutcracker]

*Nucifraga multipunctata*, Gould.

*Field identification*—Very similar to the last species, rather darker and with more white on it; the lower plumage sometimes looks almost all white. Found in the same situations as the last bird but not often occurring together. Length 15 inches: tail  $6\frac{1}{2}$  inches.

*Description*—Differs from the Himalayan Nutcracker in being more a chocolate than umber-brown in colour and much more marked with white; the nasal bristles are mottled black and white; the rump and upper tail-coverts each have a white spot; there are more white spots on the coverts and quills and a great deal more white on the lower plumage, sometimes making the whole of it appear almost white. Sexes alike.

Iris red-brown; bill horny brown; legs and feet black.

*Distribution*—*In our area.* Stuart Baker says it is found in Sikkim and Osmaston (*Journal Bombay Natural History Society, Vol. XIV, p. 819*) says "here in Sikkim it appears to be the only species found". Our Darjeeling birds show no white spots on the rump and upper tail coverts and are referable to the last species. Possibly Osmaston didn't collect any specimens. Stevens never came across it in Sikkim nor did Meinertzhagen. It is doubtful whether this race ever occurs within our limits.

*Outside our area*—"N. W. Himalayas from Afghanistan, Gilgit, Kashmir, Ladakh to S. E. Tibet.....Chumbi Valley....." (*Stuart Baker*). Bailey (*Journal Bombay Natural History Society, Vol. XXIV, p. 75*) records it from the Mishmi Hills. Meinertzhagen found all the Nutcrackers at Chakrata (not far from Simla) to be the last species and with regard to Baker's distribution remarks:—"Baker tells me.....that he has received specimens from the Chumbi Valley and Phari in Tibet. But Phari is "Tibetan Plateau" and quite an impossible treeless region where no Nutcracker could live. Baker also cites Ladak as the range of *multipunctata*. I know of no part

of Ladak where the Nutcracker could live, except where it borders Kashmir proper" (*Ibis* 1927, p. 370). Ludlow only mentions *hemispila* from the Chumbi Valley.

*Habits, etc.*—These differ in no way from those of the Himalayan Nutcracker. The only information I can find about the nesting of this species is a note by Stuart Baker (*F. B. I. Birds, 2nd ed. Vol. 1, p. 68*):—"Eggs sent me by Mr. D. Maedonald with the parent birds from the Chumbi Valley are exactly like those of the European Nutcracker: very pale blue-green speckled with dark brown sparsely everywhere and a little more numerous at the larger end. They measure about  $33.6 \times 24.6$  mm." The nest appears to be similar to that of the last species.

We now come to the Choughs, which belong to the genus *Pyrrhocorax*: birds of black plumage with brilliantly coloured bills and legs. The following key will suffice to distinguish the two species:—

- A. Bill long and slender.
  - a Bill and legs red .... The Himalayan Red-billed Chough.
- B. Bill shorter and stouter
  - b Bill yellow, legs red.... The Himalayan Yellow-billed Chough.

#### 15. The Himalayan Red-Billed Chough.

*Pyrrhocorax pyrrhcorax himalayanus* (Gould)

*Field identification*—A glossy black bird like a Crow, with bright red curved bill and legs. It is found at elevations over 8,000 feet and may be seen circling in the air or swooping down with closed wings or else on the ground. The call, melodious but plaintive, is well known to all who travel at high elevations.

*Description*—Length about 17.7 inches. The whole plumage glossy black. Sexes alike but the female is slightly smaller.

Iris brown; bill vermilion-red; legs "more purplish and not of such a bright vermilion red as the bill" (*Ludlow*).

The Himalayan Red-billed Chough is a larger bird than the European one and is generally admitted to subspecific rank.

*Distribution*—*In our area.* In Sikkim at elevations "between 8,000 and 16,000 feet in winter" (*Meinertzhagen*). Probably occurring even higher in summer.

*Outside our area*—"Throughout the Himalayas to Eastern Tibet" (*S. Baker*). They sometimes descend

as low as 5,000 feet in winter and Wollaston recorded them as high as 20,000 feet on Everest in September (*Ibis* 1928, p. 526). Hingston however did not come across it higher than 15,000 feet.

*Habits, etc*—The Himalayan Red-billed Chough is a noisy bird and its melodious though rather plaintive cry resembles its European cousin, which Seebohm renders as *Khél-o, khél-o*, and is well known to those who travel where this bird is found. The flight is somewhat characteristic—"a series of curves in the air, alternately rising with a scream, and then suddenly dropping with almost closed wings" (*Howard Saunders*). They are quite at home on the ground, walking and running with ease, and are gregarious in habits. The European bird is said to pair for life, so it is probable that our bird does so too. Ludlow writes:—"In winter it collects in huge flocks in barley-fields on the Gyantse plain. Often these flocks can be seen circling at an immense height, then with closed wings down come the birds, one after another, in a swift, slanting stoop. In the winter of 1924, while hunting for "Shao", the great Tibetan stag, in the Chumbi Valley, hundreds used to swoop down after sunset and roost under the eaves of the houses in the village of Rapinkang, where I was staying. Nest construction begins in March, and eggs are to be found in April and May. Sometimes the nests are situated in inaccessible cliffs, sometimes in holes in the walls of inhabited and uninhabited houses only a few feet from the ground. At times the bird will be found breeding in colonies, at other times only solitary nests will be found. It will construct its nest in the most secluded place imaginable, or right in the midst of a village. Frequently the same site is occupied year after year. The nest is made of sticks and twigs and is lined with wool. Three or four eggs constitute the normal clutch" (*Ibis* 1923, p. p. 53-54.) The eggs are, according to Hume, "moderately elongated ovals, very slightly compressed towards the small end. The shell is tolerably fine and has a slight gloss. The ground colour is white with a faint creamy tinge, and the whole egg is profusely spotted and striated with a pale, somewhat yellowish brown and very pale purplish grey. The markings are most dense at the large end, and there, too, the largest streaks of the grey occur". They measure about  $1.74 \times 1.2$  inches.

The European bird is said to live 16 or 17 years.

## 16. The Himalayan Yellow-billed Chough,

*Pyrrhocorax graculus forsythi* (Stoliczka).

*Field identification*—A black crow-like bird, rather smaller than the Red-billed Chough, with a shorter yellow bill and red legs. It is a noisy, sociable bird found at the same altitudes as the last species.

*Description*—Length about 16½ inches.

The whole plumage black, slightly glossed, except on the wings and tails, which are very glossy. Sexes alike, except that the female is slightly smaller.

Iris brown; bill yellow; feet vermilion-red.

Himalayan birds are larger than European ones and are now generally considered a separate race.

*Distribution* - *In our area.* Found by Stevens on the Singalila ridge at Sandakphu (11,850 feet) in early March and at Kalopokhri (10,160 feet) about the middle of April. He also saw some at Lachung (9,000 feet), in Sikkim, during the last week in February and first week in March. Meinertzhagen occasionally saw some in Sikkim in November "between 9,000 and 16,000 feet between Lachen and Gyagong". We have never seen them.

*Outside our area*—"Throughout the Himalayas from Kohat to Central Tibet and South-East Tibet" (S. Baker).

*Habits, etc.*—This is a sociable bird, like the Red-billed one, and is usually seen beating along the hillside or gliding with outstretched wings. They are just as much at home on the ground as the last bird. Stevens saw them sailing overhead near Sandakphu "settling alternately on the low bushes and rocks, hopping about the ground in the beds of the gullies on the steep, rocky slopes, and were most fearless, occasionally uttering a weird plaintive call" [*Journal Bombay Natural History Society, Vol. XXIX, p. 518*]. He never met any near villages, but Whistler, writing in the *Ibis* on the "*Birds of Spiti*", says:—"This Chough is a scavenger round camps and villages, and the carcases of small birds skinned were readily eaten by it". Hingston found them in company with the Red-billed Chough in Dharmasala, and again in his "*Bird Notes from the Mount Everest Expedition of 1924*" writes:—"A bird of higher altitudes than the previous species. A permanent resident of our base-camp at 16,500 feet. In camp it was extremely tame, as impudent and daring as the house crow, living on the scraps thrown out of the cooking-place, and spending the day amongst our tents. On the cliffs is

used to associate with herds of Barhel, picking insects out of their hair" (*Journal Bombay Natural History Society, Vol. XXXII, p. 321*). Flocks were seen as high as 23,640 feet and birds followed all the camps even up to 27,000 feet.

Ludlow came across a flock of 200 or more feeding on the hips of rose bushes during the winter at Yatung in the Chumbi Valley but failed to find it near Gyantse.

Meinertzhagen found a couple of pairs breeding near Leh at 11,600 feet, in May, in inaccessible holes. Baker writes:—"Eggs have been taken in the Liddar Valley and in S. E. Tibet in April and May from nests placed in steep rocky cliffs, either in holes or in crevices in rocks.....The ground-colour is a very pale yellowish grey, rarely with a cream tint, and the spots are of light brown and neutral tint, rather sparse as a rule but more numerous at the larger end" (*F. B. I. Birds, 2nd ed. Vol. I. p 70*). No measurements are given.

This species will not live in captivity in Bengal; although greatest care was taken of a couple that reached the Alipur Zoo, they died within a month and a half. An Alpine Chough has lived in the London Zoo for 8 years, 9 months and 8 days.

We now come to the last genus of the family, containing some remarkable birds called Ground Choughs and placed in the genus *Podoces*. One has been found in India and it has only of recent years been obtained within our area. They are small sandy-brown birds with long bills, short wings and strong legs; the nostrils are completely concealed by stiff plumes.

#### 17. Hume's Ground Chough.

*Podoces humilis* (Hume).

*Field identification.*—An active sandy-brown coloured little bird, harmonizing well with its habitat. It has a longish bill and strong legs and feet. Its flight is very feeble and when it alights it bobs in a most absurd manner. With us it does not appear to descend lower than 14,800 feet, keeping to the bare highlands of North Sikkim.

*Description*—About 6½ to 6¾ inches long.

Sandy-brown above; wing brown, edged with sandy-brown; the lower plumage and a collar round the neck isabelline; the middle tail-feathers are blackish-brown, edged with buff, the remainder buff fading to isabelline on the outermost. Sexes alike but the female is slightly smaller.

Iris brown; bill and legs black.

*Distribution*—*In our area.* Hingston is the first person to come across these birds in our area and, as a matter of fact, in India. He saw some at Thangu, in Northern Sikkim, at an elevation of 14,300 feet during the Everest Expedition of 1924 (*Journal Bombay Natural History Society, Vol. XXXII, p. 321*). Meinertzhagen was mistaken when he wrote that his specimens "appear to constitute the first authentic record of the bird from British India" (*Ibis 1927, p. 374*). Meinertzhagen got his birds at Gyagong, also in Northern Sikkim, at between 14,800 and 15,750 feet in November 1925. We did not come across it, either at Gyagong or further up in the middle of October 1927. Stuart Baker writes that specimens were sent to him "from the Chambi Valley in the extreme north of Sikkim". Of course the Chumbi, not Chambi, Valley lies in Tibet and not in Sikkim.

*Outside our area*—"Yarkand to Tibet, Koko Nur and Kansu" (S. Baker).

*Habits, etc.*—A bird of apparently elevations between 11,000 to 15,000 feet but in Sikkim it does not appear to descend below 14,300 feet. It is often seen on the bare plains with Mouse Hares (*Ochotona*) or Pikas as companions.

Its flight is very weak and not sustained and where it alights, generally on some stone or rock, it hobs up and down in a most absurd manner, according to Ludlow, uttering at the same time a plaintive cry. It is better at home on the ground, its strong legs enabling it to hop or run about with ease. Hingston says it frequents stone walls, the roofs of buildings and also enters villages freely, besides being found in the most barren tracts. Its food appears to be wholly worms and insects.

The only detailed account of this bird, as seen in Sikkim, is by Meinertzhagen. He writes:—"It was a great surprise meeting these delightful little birds in northern Sikkim. When I first spied them I was puzzled. At the first glance their pale nape made me think they were the Snow-Finch (*ruficollis*), but as they were running about like Larks, hopping on to stones like a Wheatear and bobbing their heads up and down like the Little Owl, their identity was soon disclosed. The first flock seen comprised seven birds. They were on open flat country and in among dwarf rhododendron, and only just above the tree-line of birch and large

rhododendron, which was not far distant and in full view at the time. They are wonderfully active little birds, sprightly, full of queer antics, running with lowered head and suddenly jumping on to a boulder, where they would bob up and down, the whole body being lowered in the movement. They would frequently give a huge hop off the boulder to secure some delicacy, immediately returning once again to re-commence the bobbing. This occurred on 20th November when we camped at Gyagong. Throughout the 21st we remained at Gyagong and never saw a *Podoces*, though we scoured the country in all directions.

Great was our surprise on the 22nd to find at dawn our camp surrounded by small parties of *Podoces*, which had obviously arrived quite recently, this being confirmed by the fact that the stomachs of five examined had no trace of food. It was bright frosty weather and the thermometer stood at 3° F. Their flight is short and Shrike-like. When feeding they hammer away at frozen objects with great energy, poking their heads under boulders and into rock-crevices, all with much haste and determination" (*Ibis* 1927, p. 374).

It breeds commonly in Tibet "between Phari and Gyantse, sometimes in a bank, sometimes on hill-slopes and sometimes in small "bunds" separating the barley-fields. The nest is always at the end of a hole, six or more feet long, and is a large untidy mass of dried grass and fibres lined with wool and hair. Nest construction starts in May, and eggs may be found in June and July. Two clutches which I obtained each contained six eggs, pure white, averaging 21.25 x 15.5" (*Ludlow, Ibis* 1928, p. 55). They apparently often make use of the deserted burrows of Mouse-Hares (*Ochotona*) to nest in. Hingston dug four feet into one of these and was still far from reaching the nest. Dressers gives the depth of a burrow as sometimes 12 feet.

Observations on Emerald Dove's nest and young, and  
certain habits.

By

Dr. Satya Churn Law, M. A., Ph. D., F. Z. S., M. B. O. U.

Apropos of Mr. Inglis's theme on the Emerald Dove (*Chalcophaps i. indica* Linn.) I have to offer, in response to his direct exhortation to me, the following observations as a result of my personal experience. Extremely gratifying as it is to note that Mr. Inglis considered it worth while to touch on the avicultural aspect of his subject, I need hardly emphasise that in the present state of our knowledge of this bird aviculture helps to fill some part of the gap in regard to such details as nidification, nestling characters, etc. I have had, and still continue to have, immense opportunities of studying the habits of these Doves—I have in my aviaries not less than seven pairs, all offspring among others of one original pair which is with me for more than four years and still going strong—and calling as much experience of them as my free moments permit. Looking up my record of last year (1931) I notice that the pair referred to above had as many as 6 nests (January to December) and in continuation of their nidificatory attempts had two more nests in the course of January and February, 1932. Of the 6 nests made in 1931 one only failed, its contents of one egg having been lost due to an accident; the other 5 nests produced a brood of 2 young each. The details of nesting are recorded below, with dates of each egg laid and of chicks hatched.

Nesting results for 1931.

Nest	No.	1.	
Jany.	30	1st egg laid	♀ bird found incubating early morning.
"	31	2nd egg	
Feby.	13	1st chick out	
"	14	2nd chick out	
Nest	No.	2.	
March	9	1st egg	incubation starts.
"	10	2nd egg	observed
"	23	1st chick out	
"	24	2nd chick out	

Nest	No.	3.		
April	18		one egg laid	
"	19		damaged by a fall	♀ bird broody
"	20		2nd egg laid	
"	23		egg disappears	♀ bird still broody
"	26		3rd egg observed	
May	11		chick out	observed early morning.
Nest	No.	4.		
June	6		one egg laid	incubation begins
"	7		2nd egg	
"	19		1st chick out	
"	20		2nd chick out	
Nest	No.	5.		
Nov.	19		one egg laid	
"	20		2nd egg laid	
Dec.	2		one chick hatches out	
"	3		2nd chick appears.	

It will be seen from the above that the Emerald Dove has for each month almost one separate brood, and this continuously from January to July. The period August-October remains a gap because the mother bird, which was at this time in low health, had to be shut up and given a compulsory respite. Left to herself, she would have certainly gone in for one other nest at least (during August-October). It has been stated by Mr. Inglis that these birds have "two or possibly three broods"—this record of his evidently being based on what Mr. Stuart Baker has said (viz. "the majority of the birds undoubtedly have two broods and many probably have three"). The remarkably large broods reared in captivity are no doubt made possible by the favourable circumstances, which minimize the struggle for existence. Yet the one lesson of science, which one can hardly let go by default, shows the instinct of the bird and its propensity for breeding throughout the year. The eggs laid in each nest are uniformly two in number. Should an accident happen to an egg immediately after it is laid, a third egg is produced as a rule. But if two eggs are somehow damaged, no more than the third egg is laid (vide breeding result for Nest No. 3). The second egg appears almost as a rule on the day next after the first egg has been laid but sometimes the second egg is laid on the 3rd day. The female bird begins to sit tight soon after her first egg appears. The first egg hatches out first and the

second, irrespective of the fact of its appearance on the second or even the third day, hatches out invariably on the date immediately following that of the appearance of the first chick. The period of incubation of the eggs as observed by me is 14 to 15 days, but is in midsummer earlier by a day. Although the female bird shoulders mostly the nidificatory duties, the male takes his share, not only in the task of nest-building but also in incubating the eggs and feeding the young. After one brood has been reared, the position of the old nest—and in fact its foundation—is again utilised for the new nest which has to be prepared for the second brood. Sometimes I have noticed a blind instinct gets the mastery over all intelligence of the female bird which, while still engaged in rearing the brood which just fledged out, acts no better than an automaton and goes straight for laying another clutch of eggs and sitting tight on them. In a case like this, in order to give the growing young a chance of living, I have no other alternative but to shut them up with their male parent (which will not shirk feeding them) in full view of the breeding hen. When there is such fury of egg-laying, the old nest is utilised as it is by the bird without any chance of its being repaired or remodelled. Mr. Inglis has, in common with a few other ornithologists, referred to the compactness of nests of this Dove. But so far as my avicultural observation goes, I find it difficult to call them compact; on the other hand, they are uniformly neat but loose platforms of roots, fibres and slender twigs, saucer-like in shape with a hollow or depression in the centre and devoid of any lining. I may add I hardly notice any difference between the nests made in my aviary with the examples I have come across in the wild state in my district. The feature of looseness in the composition of these nests admits of the possibility of their being seen through by a person standing underneath. A compact structure will hardly admit of this possibility. The nestlings, which are almost invariably two in number, grow rapidly, the task of feeding them being shared by both parents. It is interesting to note a parent feeding both its young by letting in their beaks together within its own mouth and regurgitating food. In its effort to blow out the food it has a queer shortened, albeit swollen, appearance with the young nestled against its bosom. No sooner has a week passed since the hatching of the eggs than do the nestlings, which have been born naked and

blind, begin to put on their juvenile garb. The transition from nestling to juvenile plumage forms, no doubt, the subject of an interesting study. An equally interesting study is the change from juvenile to adult coloration. Unfortunately the record in Mr. Stuart Baker's new Avifauna is silent in this respect. Captain Hutton's meagre description of the nestling plumage is thus quoted in Hume's Nests and Eggs: "the nestling birds are spotted with rusty buff, somewhat resembling those of our Indian Turtle Dove." Blanford wrote in the older Fauna Volume—"young birds are at first dull brown above, with very little green, and are barred rufous and dark brown beneath." As I find in my diary an entry relevant to the point, I quote it below: it refers to a nestling, hardly ten days old, evincing even at this stage by its metallic green spots the change setting in towards juvenile coloration.

"Head and neck, sides of head and neck, throat and chin bare; upper breast brown with rufous bars; lower breast and abdomen bare; flanks brown with rufous bars; back and rump light brown with white edges; upper tail coverts dull brown; tail undeveloped; primaries dark brown tipped, mottled and edged with rufous broadly in outer and narrowly in inner webs; inner aspect of primaries dull brown, sprinkled with rufous; inner secondaries dark brown, tipped with rufous, the outer web with some metallic green; scapulars and wing coverts dark brown, the primary and greater coverts with rufous tips, the latter with rufous mottlings from shaft to outer web near the tip; the median coverts dotted in centre with rufous; wing-lining and axillaries bare

Iris dark brown; bill slaty; the cere darker; legs and feet slaty, the claws with lighter tips; gape fleshy plumbeous".

I find another entry in my diary relating to a young a little over two months old. I quote it below, as it depicts the transition stage from juvenile to adult coloration:

"Forehead bluish grey with light rufous edges; supercilia light rufous; crown, nape and back dull blackish brown with light rufous tips; sides of the head and neck with considerable fine rufous barrings; lower back, scapulars, wing coverts and inner secondaries tipped with metallic emerald green and with varying amount of bronze reflections, the bases of the feathers dark brown with no green metallic sheen; bastard wing, primaries,

primary coverts, outer secondaries and greater coverts dark brown with rufous tips and edges; the inner webs of the primaries mottled with rufous; least wing coverts and shoulder of wing blackish brown like the neck with rufous edges; under-wing coverts and axillaries copper red; lower back dull black with a band of feathers across fringed white; some feathers with bronze sheen towards tip; rump grey tipped white next the lower back, dark brown towards upper tail coverts, with a subterminal band of rufous, the feathers tipped distinctly black; upper tail-coverts slaty towards base with broad subterminal band of rufous, and tipped black; tail dark brown washed with rufous, the outer feathers grey with a broad black band and patch of rufous on both webs; the outermost feather with no rufous, under-tail coverts slaty black washed with rufous; chin and throat light rufous; breast and lower parts vinous red paling on the abdomen; flanks dark grey washed with vinous red.

Bill reddish black, the red showing in the centre parts more of the upper mandible, extending to the cere, blackish toward tip; iris dark brown; eyelids slaty grey; bare patch round eye; lores bare; legs dusky red; claws horny; toes reddish plumbeous; soles pale fleshy".

Rightly says Mr. Inglis that this Dove does very well in captivity, being naturally a peace-loving and long-lived bird. A newly-caught specimen readily reconciles itself to cage-life, and a grain-eater as it is, the aviculturist finds it easy enough to manage without recourse to the multifarious menu which, however scrupulously prepared, has its efficacy discredited not often in the case of many newly captured insectivorous birds. In a mixed aviary I have kept my Emerald Doves with great success and without any untoward result. I might mention that their companions are a mixed lot of birds of varying sizes from a small Flower-pecker to a Barbet or a Thrush. The difference of opinion referred to by Mr. Inglis as to the suitability of keeping them with other birds is more fancied than real, and it seems to me that he has misunderstood what Mr. Finn wrote about them. The latter, however, discovered the unsociable manner of this Dove only in relation to birds of the allied genera, if not of the same species, and specially when these were caged otherwise than in a good-sized aviary. True it is that birds of the same species are in many cases hostile to one another and this hostility is specially in evidence in the breeding season in an aviary where more than

one pair of the same species is kept together. A pair of Emerald Doves in such circumstances will never tolerate the company of another pair, or even of an additional male or female Dove. Such fights are sometimes also manifest where a breeding pair of Emerald Doves is housed together with a pair of Doves of any of the allied genera, say, the Spotted Dove. The fight has its relation chiefly to the breeding propensity when the breeding pair has undergone the inevitable physiological change in its system and develops an idea of territory. Several immature birds and even unmated adults can be safely kept together in an aviary and I have found these are inoffensive even when kept with Red Turtle Doves and the semi-domesticated albino Doves. In a fairly large aviary the chances of hostility are to a great extent minimised and more than a pair will manage to perform their nesting operations, etc., without any apparent inconvenience to one another. Mr. Finn no doubt refers to this phase of the Dove's temperament and rightly pronounces his verdict thus: "in captivity it is given to bullying other Doves. For a good-sized aviary, however, it is a very nice bird".

SATYA CHURN LAW,  
30-3-32.

## Notes on the Natural History and Shikar of Indian Deer

By

Colonel H. S. Wood, I. M. S.

( Continued from page 194 of Vol. VI ).

## 7. Burmese Brow-antlered Deer.

The Burmese name is *Thamin*. I have not had much opportunity for knowing or shikaring this deer. I took two trips into Burmah, when stationed in Manipur, both trips aggregating three months.

I suppose, next to the Barking Deer, this is the commonest and most widely distributed deer in that country and every sportsman there must have shot it. It is the game of the sporting Tommy Atkins and takes the place of the Black buck in India. The Burmese recognize two varieties of this deer, the *Thamin Wah* and the *Thamin Whet*. The difference between the two has simply been brought about by a difference in the surroundings and nature of the food of the two animals. The *Thamin Wah* is found in very dry and arid country, sandy, very sparse grass and forest; the only tree I saw, where I obtained this *Thamin*, was the babool or Mimosa. Water in these parts, especially during the winter, is very scarce and the Burmans told me that this animal can go without water for a very long time and sometimes resorts to drinking its own urine. There may be some truth in this statement, as all the animals I shot had a distinctly nasty odour. I would like to know if any readers of the Journal have heard of this. My brother and I saw lots of them in the country lying between Manipur and Sagaing and especially numerous at Aligappa, which is about half way.

The *Thamin Wah* is not a handsome animal; the colour is light brown, the coat stiff and staring. The horns obtained in this locality were poor and very brittle. One of the stags which I shot broke its right horn when it fell. A most unusual incident happened when I shot this stag. A doe was standing beside the stag and the Meade shell which I fired burst low, bowled over the stag and unfortunately broke the leg of the doe. The Burmans with me gave chase and secured her, much to their delight. The Burmans being Buddhists

won't take life but they were glad of a feast of meat provided by someone else. They will eat anything. I once killed a Hamadryad and the Burmans took it away to eat. They gather round a carcase like vultures and once, when I shot an elephant, by the evening nothing but the bones were left. The "boss" took the tip of the trunk and I gathered that it was dried and used as a medicine.

My brother and I were mounted; it was a long way to Sagaing and we were determined to take some of the venison to our people but how? that was the question. However we cut off a haunch and for 15 miles we carried it, alternately, in one hand, with it resting on the saddle. We were sorry afterwards for taking all that "svank", as it was the nastiest venison I have ever tasted. I forgot to mention that in the country where we found this deer there was any amount of madder, a shrub with rather a pretty broad leaf, milky juice and blue flowers. I was told that the *Thamin* were very fond of this plant.

On my second visit to Burmah, my brother was stationed at Shwebo, and as there was some fine *Thamin* *Whet* ground in the neighbourhood we planned an expedition. My brother told me that the deer were shy and the forests thick, so that it was hopeless trying to stalk them on foot. He got hold of two Burmese carts, rigged up bushes at the sides and away we went. It appears that the *Thamin* does not mind a cart, as they are so accustomed to seeing those belonging to the people that work in the forest. The same stratagem is used for getting near Black buck in the North West Provinces. The Burmese cart will go anywhere and the bullocks are certainly wonderful. After many joltings and descending and ascending nullahs and ditches we arrived at the teak forest but nothing could be heard except the creaking and bumping of the cart. On entering an open glade in the forest a splendid sight met our gaze. There were 15 or 16 stags all together, apparently collected for a fight. I picked out one and my brother another; both fell and the rest galloped away. My stag's head was a very fine one, so I was very well pleased. The horns were very dark, the royals flattened at the ends with five or six tines projecting from the edges of each; they were rough like a Samblur's; the brow antlers had a sharp upper edge and were very white at the tips, and near the base there was a small tine like a tubercle.

The Burmans call this variety *Thamin Whet*, from the fact that the animal has long bristly hair like a pig, *Whet* being the Burmese for pig.

The stag I shot was almost black, but others I noticed were lighter in colour, being younger. The hair was long and bristly and uncommonly like that of a pig.

The *Thamin Whet* cannot do without water and must have marshes or partly dried up pools in which to wallow, and certainly the country through which we passed resembled this. It also must have forest in which to lie up during the hot hours of the day.

Next day I got a running shot at a stag and as he ran he made a rattling sound. I got him and on examination found that his coat was covered with black, wet clay; on the upper parts this had formed into elliptical shaped bills about the size of a plum. There were masses of these and it was these knocking against each other which had produced the noise.

I suppose the young are spotted like other deer. I never saw a single doe, so cannot describe her. I have, unfortunately, not got my measurements of horns. I have seen many heads in Burmah but the finest collection of heads of this deer I ever saw was that of Waller Senior Esq. of the Survey in Bangalore. I doubt whether any Museum has such a fine show.

[As already mentioned under the Manipur Deer, Blanford placed the *Thamin* and it together as one species (*Cervus eldi*), Oldfield Thomas in the *Journal of the Bombay Natural History Society*, Vol XXV, p. 36 separated these and also split up the Burmese animal into two subspecies, the Pegu *Thamin* (*Rucervus thamin thamin* Thos.), in which the antlers spread widely outward almost from the burr, and the Ruby Mines *thamin* (*Rucervus thamin brucei* Thos.), in which the antlers rise parallel for some distance and then spread feebly outwards. The type locality of *R. thamin thamin* is Pegu and that of *R. thamin brucei* the Ruby Mines; the latter apparently, as far as our knowledge goes, is confined to that district.

Contrary to our author's opinion, Evans considers the *Thamin*, in point of beauty, comes next to the Kashmir stag and beats the Chital. He stands about 45 inches at the shoulder and has a thick mane of coarse hair. Evans says the does, which are light fawn colour, "are smaller in comparison with the size of the stag than most deer." The young, like all other Indian deer except the Sambhur, are spotted.

We pillage Evan's *Big game Shooting in Upper Burma* for a description of the head and measurements of horn. The head "is long and narrow; the horns, almost touching at the base, sweep backwards and outwards, coming forward again so as to form a semicircle. But the chief peculiarity of this deer, and one from which it gets its name, is that the brow antler, instead of growing at an angle from the beam..... comes forward in one continuous curve, so that the effect, when seen in profile, is that of an almost complete circle. There is usually a false point on the axle, and one or two on the brow antler, which is extremely long. There is generally also a point, from about six to nine inches long, close to the top of each beam, which may be destitute of further points, or may split up into several." The number of points seems to vary a lot: Evans mentions one with fourteen. The colour of the horns also varies from golden-brown to bluish-grey and every intermediate shade. Evans thinks, and we agree, that "when measuring heads of this deer, the length of the brow antler should be given, as half the beauty of a thamin's head lies in the brow antler". Our author appears to have done this when measuring the horns of the closely allied Manipur Deer. Evans considers a good average head to be "one of about 34 in., with a brow antler of 12 or 13 in." The biggest he ever got measured "37½ in., with a brow antler of 17½ in." but he says "Heads measuring 42 in., and over, exclusive of the brow tine, have been shot." Rowland Ward's record is of a stag shot in Upper Burma and owned and measured by the Mess, 1/10th Gurkha Rifles. It measures:—44" Length on outside curve, not including brow-tine. 6½" circumference. 24½" Tip to tip. 36¾" Widest inside. 9+5 Points.

The thamin is a much persecuted animal, both by Europeans and natives. Anybody with a gun, whether he has or has not a license, is after his blood and shoots him down regardless of the size of heads procured. The Burmese also hunt him with dogs but are not very successful at this sport but nevertheless the poor deer is much harried.

Evans speaks of the preponderance of does, for which he blames the Game Laws. He says:—"As they stand at present, there is no limit to the number of thamin which may be killed, nor any specification as to size of the head, nor is there any charge for shooting them. But the shooting of females is strictly prohibited." He advocates that the Local Government should for the next

two years "limit the number of stag heads to four, none to be shot without a game license costing Rs. 30 (to include big game of all kinds except elephants), and would permit two thamin does to be shot by the license-holder in addition to the stags." When the number of them has been reduced sufficiently, then the shooting of does should be prohibited. This was written in 1911. We wonder what the condition of the *Thamin* is at the present day? Now that Burma has started game sanctuaries with a European Forest Officer in charge, perhaps the number of warrantable stags is on the increase. Another criticism of the Game Laws in force when this sportsman wrote is that "No males of deer, barking deer excepted, are permitted to be shot in reserved forests between June 15 and October 15.....But thamin do not shed their horns till August, and they are not entirely free from velvet till the middle or end of January. Therefore, would it not be as well to make the close season for thamin from August 1, or earlier, to February 1, omitting the words "in reserved forests" and making an exception in the case of villagers whose crops thamin are in the habit of visiting?" This appears to be sound except for the "exception." Once an exception is made in the rules, it would be very difficult to prove that the deer were *not* shot while feeding on the crops and the whole rule would be negatived. Possibly the Game Laws have been revised since 1911.

Evans says "When thamin are found in the open it is very interesting stalking them on foot. They are extremely wary and seldom allow a man within a hundred yards". He gives some very interesting remarks about their fighting proclivities and says "The stags are very belligerent, and whether it is due to the peculiar curve of the brow antler, or their excessive fighting proclivities, the fact remains that a large number are blind in one eye, and many in both. The proportion of old stags who have lost one or both eyes from horn thrusts is, I should say, certainly not less than one in three. The rutting season lasts from February to the end of April, after which the old stags go off, either alone or attended by one or two does or a small stag, who acts as a tag. A good head with a herd is seldom seen after May. The best time for thamin shooting is from March up to the middle of April." [Editor.]

(To be continued)

## Some Fishing notes by a tyro.

At the moment I am solely interested in fly fishing. A few years ago I went out a lot with P., who seemed to get very small return for the hours of casting and reeling in, of course I was very young in those days. After a visit to the Jaldacca this cold weather with two keen fishermen, one of whom used big tackle and had a blank day, I thought I would try the Rydak and Sankos with a fly despite the dictum of the experts that these two rivers had never yielded a fish to a fly yet. At the beginning, using a variety of home salmon and trout flies, I was almost forced to believe the experts were right; however, for want of some better way of wasting time and money I got up a challan of weird and most unlikely looking flies from Manton's and have had really good fun. R and I have been out every week and between us have come to the conclusion that for small Mahseer a fly spoon takes best, while Katli take certain flies and a fly spoon equally well. I find that a Durant's Pesty Queen (on No 6 Limerick hooks) is very deadly: Katli cannot resist it over here. A Hardy's Favourite is useful as a change, while the only fish I have heard of being caught at Bhutan Ghat this year (on the Rydak) was a Mahseer (1½ lbs.) on a Durant's Red Dragon when the river was coming down like a bottle of Guinness. To my mind there is no more pleasant way of spending one's leave day than with a light fly rod; what matter a blank day or two? They have been spent in delightful surroundings.

Fairweather does not seem to think much of the Sankos: there is a nice pool at the bund for heavy tackle, while above the bund, if one is prepared to wade the small side stream to which he refers, there is very nice water for both fly and spoon. A boat or an elephant would be a great help. The two best fish I have had reported were both taken in the Sankos, a 25 pounder at Balapara and another of 22 lbs. A good deal of poaching goes on, which is very difficult to stop, mostly in the form of night lines and dead bait.

The Rydak has been disappointing for some years, probably owing to the trap referred to being improved or used more extensively. C. & G. fished it thoroughly

from Bhutan Ghat to Teamari this year and the former told me it was no use whatever. The Western channel has been bone dry all this cold weather, while during last rains the Eastern channel went further east and took the Natai channel (between Newlands tea and Teamari). This channel is a mass of small streams, where the Dowla rejoins the Rydak; I believe it used to be a great spot, but now there is very little water. However, there are plenty of small Mahseer and Katli to be had, and the attraction of clear water even at this time.

Can you or any members suggest why we do not seem to get the so-called Indian Trout (*Barilius bola*) in the Rydak or Sankos? (We have seen them caught in the Harwaputa-Mook opposite Mornai, which to all intents and purposes is the Sankos *Elditor*) They are found in the Jaldacca up to 2 lbs. and are a very sporting fish I am told. If any one has caught them here I should be more than grateful for information as to where and how? Has anyone ever fished the Jainti river? There is nice water high up if one is not afraid of some stiff climbing and wading.

23rd May 1932.

F. R.

With regard to *Barilius bola* Mr. Shebbeare writes:—"I am not sure as to having ever seen one in the Rydak. I should say it is unusual for anybody, even if he fishes a lot, to get more than half a dozen in the season, though he might if he laid himself out to do it—so he isn't what one would call common anywhere. If I were out to get them for a bet or something, I would try in a small sandy stream a good way from the hills. The Rydak and Sankos are not too far east for *Barilius bola*, because they are commoner in Goalpara than in the Duars—if anything.

He is certainly a sporting fish, only you unfortunately mostly get him on too heavy tackle.

You can see what I take to be them flashing in almost any small, sandy stream, but of course these may be other species of *Barilius* or even *Danio*—they look too big to be anything but *Barilius bola* or *Barbus spilophilus* (used to be called *Barbus chagunio*)."

### The Green Pit-Viper

We have received from the U. S. National Museum among the "Proceedings" a paper on the Green Pit-Viper (*Trimeresurus gramineus*) by Leonhard Stejneger. In this, after reviewing the work of earlier authorities on this snake, he comes to the conclusion that there are three forms, which he names:—

1. *Trimeresurus gramineus gramineus* Shaw.
2. *Trimeresurus gramineus stejnegeri* Schmidt.
3. *Trimeresurus gramineus yunnanensis* Schmidt.

The last one only occurs in Yunnan and is distinguished by having only 19 scales round its midbody instead of 21. The other two are distinguished on 4 characters, viz:—

1. Size of internasals and their contact or separation by intervening scales.
2. Fusion of the nasal shield with the first supralabial or their separation by suture.
3. Presence or absence of one or more scales between the nasal and the shield bordering the pit anteriorly.
4. Size and arrangement of gular scales.

Stejneger was able to examine 65 specimens, of which 11 came from Himalayan regions and the rest from China or the Farther East, and concludes that the mountain form is *stejnegeri* and the lowland form *gramineus* but that the characters are variable. For character 1, 97 per cent of the mountain form have small internasals separated by intervening scales, while 80 per cent of the lowland form have large internasals in contact. Taking character 2, 97 per cent of the mountain form have the two shields separate and 77 per cent of the lowland form have them fused. With character 3, 97 per cent of the mountain form have one or two intercalated scales and 67 per cent of the lowland form have none. With character 4, 59 per cent of the mountain form have the chin scales irregular and 88 per cent of the lowland form have them paired.

Character 4 is evidently the least reliable. Nevertheless, he says, in nearly every instance it is possible to refer a specimen to its proper geographical series by a combination of the characters.

After reading the paper, it became of interest to examine the specimens of *T. gramineus* in the Darjeeling

Museum. There are 12 of them but unfortunately 8 of them are from one locality—Mungpoo, at an elevation of 3,000 to 3,800 feet. Only 2 were from the Dooars. The following table shows how they agree with Stejneger's characters:—

Character	For <i>gramineus</i>				For <i>stejnegeri</i>			
	1	2	3	4	1	2	3	4
10 High level snakes	2	0	0	8	8	10	10	2
2 Low level snakes	2	1	1	1	0	1	1	1

Character 4 gives an opposite decision to all the others and is even less reliable with our snakes than with the Chinese. Leaving that out, it is evident that our hill snake are *T. g. stejnegeri* but that the two Dooars snakes are nearer *T. g. gramineus*, though not far enough from the hills to have the full characteristics of that race.

Among Stejneger's snakes was one labelled Darjeeling in the British Museum, which he noted as exceptional because it gave a preponderance of lowland characters, and I think there can be no doubt that this must have come either from the Dooars or the Terai.

G. E. Shaw.

## List of the Butterflies found in our area.

By

C. M. Inglis, F. Z. S., F. E. S., E. M. B. O. U.

(Continued from page 124 of Vol. VI.)

## Family VI. Nymphalidæ

- \*228 *Charaxes polyxena hierax* Fd.  
The Tawny Rajah.
- \* ♂ variety *hindia*. But.  
♂ variety *pleistoanax*. Fd.
- \*229 *Charaxes aristogiton*. Fd.  
The Scarce Tawny Rajah.
- \*230 *Charaxes marmax* Wd.  
The Yellow Rajah.
- +231 *Charaxes kahruba* M.  
The Variegated Rajah.
- \*232 *Charaxes fabius fabius* F.  
The Black Rajah.
- \*233 *Eriboea athamas athamas* Dr.  
The Common Nawab.
- \*234 *Eriboea arja* Fd.  
The Pallid Nawab.
- 235 *Eriboea moori sandakanus* Frub.  
The Malayan Nawab.
- \*236 *Eriboea dolon centralis* Roth.  
The Stately Nawab.
- \*237 *Eriboea eudamippus eudamippus* Db.  
The Great Nawab.
- \*238 *Helcyra hemina* Hew.  
The White Emperor.
- \*239 *Apatura sordida sordida* M.  
The Sordid Emperor.
- \*240 *Apatura ambica ambica* Koll.  
The Indian Purple Emperor.
- \*241 *Apatura chevana* M.  
The Sergeant Emperor.
- \*242 *Apatura parvata* M.  
The Brown Prince.
- \*243 *Apatura parisatis parisatis* God.  
The Black Prince.
- \*244 *Herona marathus marathus* Db.  
The Pasha.

- \*245 *Sephisa chandra* M.  
The Eastern Courtier.
- \*246 *Euripus consimilis consimilis* Wd.  
The Painted Courtesan.
- \*247 *Euripus halitherses* Db.  
The Courtesan.
- \*248 *Diagora persimilis persimilis* Wd.  
The Siren.
- \*249 *Hestina nama* Db.  
The Circe.
- \*250 *Calinaga buddha gautama* M.  
The Freak.
- \*251 *Penthema visarda visarda* Db.  
The Yellow Kaiser.
- \*252 *Dichorragia nesimachus* Bdv.  
The Constable.
- \*253 *Stibochiona nicea nicea* Gray.  
The Popinjay.
- \*254 *Euthalia lepidea lepidea* But.  
The Grey Count.
- \*255 *Euthalia julii appiades* Men.  
The Common Earl.
- \*256 *Euthalia jahnu jahnu* M.  
The Plain Earl.
- \*257 *Euthalia kesava arhat* Fruh.  
The Powdered Baron.
- \*258 *Euthalia telchinia* Men.  
The Blue Baron.
- \*259 *Euthalia garuda suddhodana* Fruh.  
The Baron.
- \*260 *Euthalia jama jamida* Fruh.  
The Streaked Baron.
- \*261 *Euthalia phemius* Db.  
The White-edge Blue Baron.
- \*262 *Euthalia lubentina indica* Fruh.  
The Gaudy Baron.
- \*263 *Euthalia franciæ franciæ* Gray.  
The French Duke.
- †264 *Euthalia duda* Stg.  
The Blue Duchess.
- \*265 *Euthalia durga durga* M.  
The Blue Duke.
- \*266 *Euthalia nara nara* M.  
The Bronze Duke.

- \*267 *Euthalia sahadeva sahadeva* M.  
The Green Duke.
- †268 *Euthalia iva* M.  
The Grand Duke.
- 269 *Euthalia nais* Forst.  
The Baronet.
- 270 *Euthalia anosia saitaphernes* Fruh.  
The Grey Baron.
- \*271 *Lebadea martha martha* F.  
The Knight.
- \*272 *Neurosigma doubledayi doubledayi* Wd.  
The Panther.
- \*273 *Abrota ganga* M.  
The Sergeant Major.
- \*274 *Liminitis danava* M.  
The Commodore.
- \*275 *Liminitis zayla* Db.  
The Bicolour Commodore.
- \*276 *Liminitis daraca* Db. & Hew.  
The Green Commodore.
- \*277 *Liminitis dudu* Wd.  
The White Commodore.
- \*278 *Liminitis zulema* Db.  
The Scarce White Commodore.
- \*279 *Liminitis procris procris* Cr.  
The Commander.
- \*280 *Pantoporia nefte inara* Db.  
The Colour-Sergeant.
- \*281 *Pantoporia cama* M.  
The Orange Staff Sergeant.
- \*282 *Pantoporia selenophora selenophora* Koll.  
The Staff Sergeant.
- \*283 *Pantoporia zeroa* M.  
The Small Staff Sergeant.
- \*284 *Pantoporia opalina orientalis* El.  
The Hill Sergeant.
- \*285 *Pantoporia ranga ranga* M.  
The Blackvein Sergeant.
- †286 *Pantoporia asura asura* M.  
The Studded Sergeant.
- \*287 *Pantoporia perius* L.  
The Common Sergeant.
- \*288 *Pantoporia jina* M.  
The Bhutan Sergeant.

- \*289 *Neptis columella ophiana* M.  
The Shortbanded Sailer.
- 290 *Neptis jumbah jumbah* M.  
The Chestnut-streaked Sailer.
- 291 *Neptis megadha khasiana* M.  
The Spotted Sailer.
- \*292 *Neptis hylas varmona* M.  
The Common Sailer.
- 293 *Neptis hylas astola* M.
- \*294 *Neptis soma soma* M.  
The Sullied Sailer.
- \*295 *Neptis nandina susruta* M.  
The Clear Sailer.
- \*296 *Neptis yerburyi silkima* Evans.  
Yerbury's Sailer.
- \*297 *Neptis sankara quilta* Swin.  
The Broad-banded Sailer.
- \*298 *Neptis vikasi pseudovikasi* M.  
The Dingy Sailer.
- \*299 *Neptis cartica cartica* M.  
The Plain Sailer.
- †300 *Neptis anjana nashona* Swin.  
The Rich Sailer.
- \*301 *Neptis ananta ochracea* Evans.  
The Yellow Sailer.
- \*302 *Neptis miah miah* M.  
The Small Yellow Sailer.
- \*303 *Neptis antilope melba* Evans.  
The Variegated Sailer.
- \*304 *Neptis manasa* M.  
The Pale Hockeystick Sailer.
- 305 *Neptis nycteus nycteus* De N.  
The Hockeystick Sailer.
- 306 *Neptis narayana nana* De N.  
The Broadstick Sailer.
- \*307 *Neptis radha radha* M.  
The Great Yellow Sailer.
- \*308 *Neptis zaida* Db.  
The Pale Green Sailer.
- \*309 *Neptis viraja viraja* M.  
The Yellowjack Sailer.
- \*310 *Neptis hordonia hordonia* Stoll.  
The Common Lascar.

- \*311 *Cyrestis coeles coeles* F.  
The Marbled Map.
- \*312 *Cyrestis thyodamus thyodamus* Bdv.  
The Common Map.
- \*313 *Chersonesia risa* Db.  
The Common Maplet.
- \*314 *Pseudergolis wedah* Koll.  
The Tabby.
- \*315 *Hypolimnas misippus* L.  
The Danaid Eggfly.
- \*316 *Hypolimnas bolina* L.  
The Great Eggfly.
- \*317 *Doleschallia bisaltide continentalis* Fruh.  
The Autumn Leaf.
- \*318 *Kallima inachus inachus* Bdv.  
The Orange Oakleaf.
- \*319 *Kallima atompra* M.  
The Scarce Blue Oakleaf.
- 320 *Precis hierta hierta* F.  
The Yellow Pansy.
- \*321 *Precis hierta magna* Evans.
- \*322 *Precis orithyia ocyale* Hub.  
The Blue Pansy.
- \*323 *Precis lemonias lemonias* L.  
The Lemon Pansy.
- \*324 *Precis almana almana* L.  
The Peacock Pansy.
- \*325 *Precis allites* Joh.  
The Grey Pansy.
- \*326 *Precis iphita iphita* Cr.  
The Chocolate Soldier.
- \*327 *Pyrameis cardui* L.  
The Painted Lady.
- \*328 *Pyrameis indica indica* Herbsi.  
The Indian Red Admiral.
- \*329 *Vanessa canace canace* L.  
The Blue Admiral.
- \*330 *Vanessa ladakensis* M.  
The Ladak Tortoiseshell.
- 331 *Vanessa urticae rizana* M.  
The Mountain Tortoiseshell.
- \*332 *Vanessa caschmirensis asis* Fruh.  
The Indian Tortoiseshell.

- \*333 *Vanessa antiopa yedanula* Fruh.  
The Camberwell Beauty.
- \*334 *Polygonia interposita agnicula* Moore.  
The Thibetan Comma.
- \*335 *Symbrenthia hippoclus khasiana* M.  
The Common Jester.
- \*336 *Symbrenthia hypselis cotanda* M.  
The Spotted Jester.
- \*337 *Symbrenthia niphanda niphanda* M.  
The Bluetail Jester.
- \*338 *Symbrenthia silana* De N.  
The Scarce Jester.
- \*339 *Argynnis hyperbius hyperbius* Joh.  
The Indian Fritillary.
- \*340 *Argynnis childreni childreni* Gray.  
The Large Silverstripe.
- \*341 *Argynnis lathonia issæa* Dbl.  
The Queen of Spain.
- \*342 *Argynnis clara manis* Fruh.  
The Silverstreak.
- \*343 *Argynnis altissima* El.  
The Mountain Silverspot.
- \*344 *Argynnis gemmata gemmata* But.  
The Brilliant Silverspot.
- \*345 *Argynnis pales eupales* Fruh.  
The Straightwing Silverspot.
- \*346 *Melitæa arcesis sikkimensis* M.  
The Blackvein Fritillary.
- \*347 *Cupha erymanthis lotis* Sulz.  
The Rustic.
- \*348 *Atella phalanta* Drury.  
The Common Leopard.
- \*349 *Atella alcippe alcippoides* M.  
The Small Leopard.
- \*350 *Issoria sinha sinha* Koll.  
The Vagrant.
- \*351 *Cynthia erota erota* F.  
The Cruiser.
- \*352 *Cirrochroa aoris aoris* Db.  
The Large Yeoman.
- \*353 *Cirrochroa tyche mithila* M.  
The Common Yeoman.
- \*354 *Cethosia biblis tisamena* Fruh.  
The Red Lacewing.

- \*355 *Cethosia cyane* Drury.  
The Leopard Lacewing.
- \*356 *Ergolis ariadne pallidior* Fruh.  
The Angled Coster.
- \*357 *Ergolis merione assama* Evans.  
The Common Coster.
- \*358 *Pareba vesta vesta* F.  
The Yellow Coster.
- \*359 *Telchinia viola* Hub.  
The Tawny Coster.

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