

THE JOURNAL OF THE
DARJEELING NATURAL HISTORY
SOCIETY



VOL. XII - - - - No. 2.

Issued October 1937.

Edited by C. M. INGLIS, F.Z.S., F.R.E.S., B.E.M.B.O.U.

DARJEELING NATURAL HISTORY SOCIETY.

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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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HALCYON SMYRNENSIS SMYRNENSIS (Linnæus).
The White-breasted Kingfisher.
½ Nat Size

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—*—
Vol. XII.—No. 2.
—*—

The Kingfishers of our area.

By

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

(With a coloured plate).

(Continued from page 6.)

Our next genus is *Halcyon*. There is some difference of opinion as to this genus some lumping several genera into it but we follow Stuart Baker. The only feature which we will mention is the very characteristic one of having a white wing patch at the bases of the primary quills.

Two species are found in India one of which *Halcyon smyrnensis* is divided into four sub-species by Baker. Only one of these occurs in our area.

8. The White-breasted Kingfisher.

Halcyon smyrnensis smyrnensis. (Linn).

Field identification :—A familiar Kingfisher of the plains as often found away from as near water and easily recognized by its greenish-blue upper plumage and huge patch of white, from chin to the centre of the breast, surrounded by chocolate-brown.

Its discordant cry can be heard from a long distance.

Description :—No detailed description is necessary as the colouration is shown in the coloured plate.

The colours of the soft parts are described by Stuart Baker as "Iris hazel to dark brown ; bill coral-red to deep

red, purplish-brown on the tip and edges of the upper mandible; legs and feet coral red."

The length is about 11 inches; wing $4\frac{1}{2}$ to 4.9 inches; tail 3.3 and bill 1.9 to 2.35 inches.

"*Young birds* are like the adults but have the black coverts tinged with green and the white feathers of the fore-neck and breast narrowly edged with blackish. The bill is dull brown tinged with red, more especially on the lower mandible (*Fauna B. I. 2nd ed. Vol. IV. p. 209*).

Distribution: In our area.—Common in the plains and though found in parts of the Himalayas, and elsewhere, as high as 6,000 feet is rare in our hills. Mr. Matthews has seen it up the Tista and Rungeet rivers as far up as Singla and a pair tried to breed on Jinglam T. E. at 3,000 feet elevation but found the ground too hard. All our specimens are from the Duars.

Stuart Baker gives the range of the typical race as "Asia Minor, Syria, Arabia, Mesopotamia, Persia, Afghanistan Beluchistan, Sind, Punjab and Kashmir." The race *fusca* he says is found in "Practically all India except the extreme South of Travancore and the range occupied by the preceding form; all Burma, Malay Peninsula, Siam and Cochin China."

Whistler disagrees with this treatment of these subspecies and considers that, with the exception of from Coorg to Cape Comorin, all these Kingfishers belong to the typical form *Halcyon smyrnensis smyrnensis*.

Habits:—This beautiful Kingfisher is, unlike most others, largely a land bird obtaining most of its food there. It may be found in many places, forest or open country, on rivers, lakes, canals, the edges of tanks, even in cities like Calcutta and Madras. In Bihar we often saw it in our garden and near the rice fields. Eha wrote (*Common Birds of Bombay*) "wherever there is anything like a tank, or pool or even a shallow well, with a tree over hanging the water, there you will find it. It will even visit a garden tub and enjoy a plunge bath. The two conditions it asks for are

shade and water". This is one of the birds which one often sees, during a railway journey, perched on a telegraph wire alongside the permanent way.

They occur singly or in pairs and, where they have been persecuted, become very shy. Although most obtrusive in colour they are more so from their loud harsh cry which is uttered both on the wing and when at rest and may be heard from a great distance. Wait has rather aptly described it as a harsh, bubbling scream." There is another cry often heard, which is described by Finn. "Occasionally, presumably when under the influence of tender passion, he will fly erratically about uttering a wailing note". The same naturalist says that, during courtship, they lift up the tail and droop the wings showing off the white patch at the base of the primary quills.

Finn describes their flight as slow but most naturalists have found it strong and direct.

Most of their food is found on land and captured by flying down at it from a perch. It is very varied but consists principally of locusts, grasshoppers and crickets. It will even enter a bungalow to capture one of the latter, as Mason records having seen one of those most destructive crickets (*Brachytrypes achatinus*) taken from a verandah wall. They also eat other insects and will consume most things which are not too large for them to tackle or swallow. Lizards, small crabs, water-insects, shrimps, frogs, tadpoles, fish and even, sometimes, mice and small birds. Stuart Baker has seen them take cicadae from the trunks of trees and says that "prawns, small crabs etc. are taken in preference to fishes when it hunts streams."

With regard to eating small birds Eha wrote that a friend of his kept one of those Kingfishers in an immense aviary along with some other small birds and that the Munias disappeared rapidly and mysteriously until it was discovered that they were disappearing down the throat of the Kingfisher. Needless to say it was immediately ejected.

Briscoe also records seeing one of those Kingfishers attack a bird and, actually saw one fly past him with a small bird in its bill.

Finn found it robbing Dabchicks of the fish which they had caught and also wrote "when he does strike at something in the water, he glides down slantingly and touches the surface in a very half-hearted way, although when taking his bath he dashes in boldly enough?" (*Birds of Calcutta. Page 101*).

This bird used to be ruthlessly captured and killed. Jerdon wrote "Parties of Burmese occasionally visit India and procure the skins of this and other Kingfishers. They are, it appears, in great request at the capital for the court dresses. Some are said to be exported to China, where the feathers of this and others are used as a foil to impart a rich colour to glass ornaments." (*Birds of India. Vol. I. Page 226*).

Davison also wrote (*Birds of Tenasserim, Stray Feathers. Vol. VI. Page 74*), "The skins of this species are collected and exported to China. I have seen at Moulmein and Singapore shops kept by Chinamen, which contained many hundred flat skins of this bird; each skin is said to be worth four annas. The skins of the other species, though as brightly coloured, are not valued."

When writing on "*The Birds of the Madhubani Sub-Division of the Darbhanga District, Tirhut*" we said "large numbers, are snared by the native fowlers. One man told me that he usually snared 100 to 150 from October to January and that they fetched from Rs. 15 to Rs. 20 a hundred. This shows what numbers of this useful Kingfisher are killed as, in some parts of the country, there are hamlets of these men who do nothing else, during that time of the year, but snare these birds," when after these birds they sometimes caught a specimen of the very handsome Black-capped Kingfisher (*Haleyon pileata*) these were always brought to me. They looked upon them as albinos of the White-breasted species. This Kingfisher is not found in our area. While on a visit to Bihar a few years

ago one of these men told me that, owing to the strictness of the Customs Department trade in Kingfishers and Egrets skins had dwindled down to nothing, in fact was nearly dead as few merchants were willing to risk confiscation of their stock.

This bird should be very strictly preserved as fish scarcely enters its menu and it does an immense amount of good keeping down locusts, crickets etc.

We know nothing with regard to the breeding of this bird in our area and cannot do better than quote Stuart Baker's account of its nidification. He writes—"This bird is one of forests and jungles as well as of all kinds of open and cultivated country. It is found throughout the plains wherever there are suitable rivers, tanks etc., on the banks of which it can breed. At the same time it is often found away from these. Betham says that round about Poona this bird does not frequent rivers and lakes but is found away from these. The nests from which I took eggs were all situated in the banks of dry nullahs some distance from water. The nests were about two feet in and are used again and again even when the eggs have been stolen from them."

"In North Cachar this Kingfisher bred in very great numbers on some of the bigger streams, the forest coming down to the banks on either side. When boating down these streams I have sometimes come on twenty or thirty nests in a day, just the usual tunnels dug in a bank for 2 or 3 feet, the eggs being laid on the bare sand except for odd scraps carried in by the birds accidentally or wind-blown. Sometimes, however, in these hills the birds make very abnormal nests. An article written by me for 'The Asian' newspaper, before I had visited the rivers on which these birds commonly nested, is perhaps worth quoting :—"It has another and, at least so far as these hills are concerned, a far more general habit of building a nest for itself, which may be said to roughly resemble a large, untidy edition of an English Wren's place of abode.

"First I had some eggs brought to me by a native, who said that he had taken them from a moss nest built amongst

the overhanging roots of a tree growing at the side of a nullah. Some time after some more eggs were brought in to me and a similar description of the nest given, but on this occasion I went with the man to the nullah from which the nest was said to have been taken and we could find no trace of it, so I concluded he had been lying. The native, a Cachari, was, however, very positive in his assertions and went away swearing at my incredulity. Within a few days he came back with two newly laid eggs, a quantity of moss and a hen Kingfisher of this species alive in a basket. In this case he had found the nest embedded in a hollow in a rock and, setting a noose for the parent bird, had, on catching it brought it to me with the remnants of the nest and the two eggs. Eventually I was fortunate enough to find a nest of this description for myself. I was creeping down a deep nullah, along the bottom of which a little water was trickling, and making a false step, I splashed into a little pool of water, the noise frightening a Kingfisher, which flew from the bank close to my head and, looking up, I saw the nest—a mass of moss of a large oval in shape wedged into a hollow between two stones, covered at the top by another and supported underneath by a projecting root. It contained four eggs which I took; but the nest fell to pieces on being removed and appeared to be merely a lot of moss pushed into the hollow and then roughly fashioned into a hollow oval. Next year a pair of these birds were seen to frequent a nullah near a camping house where I was then halting. On some natives and myself searching about, one of the former discovered a nest just commenced to be built in a hollow, caused by a large oval stone, which had been previously half embedded in the earth, falling out. Dismissing my men, I seated myself on the opposite bank about twenty-five or thirty yards off, and behind a bush. Taking out a pair of opera-glasses I had not long to wait before one of the birds came back and, after taking a good look at the nest, went away again and returned in a few minutes with a mass of wet moss in his bill; clinging to the edge of the hole it commenced forcing this moss into that already placed at the base of the hollow, pushing it with the front and

pressing it with the sides of the bill, seeming to use all the force it was capable of. I could see no attempt at fastening it together or intertwining it in any way, and this nest, when afterwards examined, proved to consist of layers of moss placed one on the top of the other. The force used in pressing the wet and muddy material together had rendered it sufficiently stable to stand the work required of it by the bird but, finally, on one piece at the base being removed, the whole structure at once came to pieces. Both birds worked hard at the nest, for upwards of an hour, until nearly 10 A.M., when, as they seemed to have finished work for the time being I went away.

“Returning nearly a month later I took six eggs from this nest, two showing signs of incubation and four fresh.”

“After I had written the above I found that for every bird which nested in the forest a hundred nested in the banks of streams, making the usual tunnel and chamber. Twice, however, after this I succeeded in finding other nests similar to the above, small natural holes, faced and backed by wet muddy moss.

In the rivers etc., I found the birds bred in the end of March to early May, and these seem to be the breeding months over most of the plains of India and Burma and in the Kumaon Terai. Blewitt, however, found them breeding near Hansie in June and July; Adam says they breed up to June in the Sambhur Lake, during which month also Oates took eggs in Pegu.

“In the nullahs and ravines in the forest, where flooding had not to be guarded against, I took eggs, full clutches, from the 4th April to the 26th August.

“The normal full clutch of eggs is six; five or seven is quite common, while Whympser once took one of eight in the Nepal Terai.

“It breeds there, as in the Assam hills, up to 4,000 but is much more common below 2,500 feet.

“One hundred eggs average 28.9×26.2 mm.

Both birds incubate, both excavate their home and both tend and feed the young, at first in the nest and after about a month outside the nest. The young then perch in a row on the top of the bank above the tunnel or on any convenient branch or twig overhanging it. At night all the young and both the parents retire to the nest to sleep, and continue to do so until the young, or what remains of them, are dispersed." (*Nidification of Birds of the Indian Empire, Vol. III pp. 419 to 421*).

Finn writes that it bears captivity well and has been established both at the London and Calcutta Zoological Gardens. Major Flower writing "*On the Duration of Life in Vertebrate Animals*" (*Proc. Zoo. Soc. 1935, p. 1383*) does not mention this bird amongst the Kingfishers which he gives, though his article is full of records of the London Zoo. The only special mention we can find of this Kingfisher in the Calcutta Zoological Gardens is where Sanyal mentions them breeding regularly in a steep bank in the Rhinoceros' enclosure. He writes about Kingfishers in general "In captivity they are uninteresting birds, sitting motionless on a perch and watching, not their prey, but the busy gambols of the other inmates of the house. The only time that one is observed to become lively is when food is forthcoming".

There is however, a most interesting article, by E. W. Harper, which we quote *in extenso*. He wrote: "Although in no part of the world can the Kingfisher be said to be a common cage-bird, on account of the difficulty of catering for its appetite, yet anyone who really values gorgeous colours in a bird can, with very little more trouble than is ordinarily bestowed upon an insectivorous bird, keep the Kingfisher in perfect health and plumage.

The first two White-breasted Kingfishers which I reared were fed entirely upon pieces of fish, cut up to about half the size of a hazel-nut; also on small whole fish, when procurable, alive or dead. These birds were procured when just ready to leave the nest, and kept in good health for four months, when I presented them to the Calcutta Zoological Gardens. This was in 1897, and they were the first specimens the Zoological Gardens had ever had.

"The London Zoological Gardens, however, purchased a single specimen as long ago as 1884. Unfortunately a civet cat killed the two birds at the Calcutta Zoo a few days after their arrival.

"Last summer having obtained another White breasted Kingfisher, I determined to adopt a different method of feeding it, small pieces of lean raw meat were pushed down the bird's throat, until in a day or two, it took the meat of its own accord. This meat diet was varied with pieces of fish, the bird always striking its food (as it would have done a live fish) upon its perch three or four times before swallowing it. This was done with a jerking movement of the whole body. Lizards, shrimps and grasshoppers are greedily accepted as dainty morsels by this bird. Although I have had the bird about nine months, yet I have never seen it drink. Its meat and fish are always placed in a jar containing three or four inches of water, into which it plunges its massive beak to take out its food. I might also add that the bird sometimes immerses its beak in the water, instantly withdrawing it with a shake of the head, even when not feeding.

"For some weeks the Kingfisher was kept in an aviary containing a number of other birds, such as minivets, white bellied drongos, black-headed orioles, golden-backed woodpeckers, etc., with all of whom it agreed perfectly, but owing to the fact that other birds used to eat any meat or fish scattered by the Kingfisher, and as this upset their digestions, I had to remove the latter bird to a separate cage.

"It greets me with a faint cry accompanied by other signs of pleasure when I offer it any food. It is tame enough to sit upon my finger; but in the presence of strangers at close quarters, evinces a certain amount of fear. The bird's plumage is perfect, and quite as bright as that of a wild bird. Mr. F. Finn, B.A., F.Z.S., Deputy Superintendent of the Indian Museum, who saw the bird, said "it is a distinct triumph." The bird is extremely fond of bathing as might be expected. When I think it requires a bath, I stand the

cage in a tub of water a foot deep, removing the lower perch of the cage. It plunges in head first, sometimes a dozen times in as many minutes. The ejection of pellets of fish-bones and other indigestible matter is preceded by a few minutes gaping and straining. The average weight of food eaten in one day is $1\frac{3}{8}$ ounces, or equivalent to about 21 minnows."

(To be continued.)

Observations on the Tiger and its Shikar

By

LIEUT. COL. H. S. WOOD. I. M. S.

The ambition of every shikari in India is to bag a Tiger, and with what pride one views his first bag. Even with seasoned shikaris one cannot help one's heart beating when one sees this magnificent denizen of the jungle. It is a popular belief that one cannot get Tiger unless one has an introduction to some Indian Rajah, or without the expenditure of hundreds of rupees for beaters etc. This is a mistake. Provided one is keen, is prepared to swank and to undergo some exposure and hardship, bagging a Tiger or Tigers is not difficult, as I shall show later on.

The native shikaris recognise two varieties, *i.e.* the *Bag* and the *Sher Bag*, the latter being a larger animal, with a so-called mane, but which is really a ruff of long hair encircling the lower part of the neck. But both these are of the same species. Some authorities, such as Brigadier General Pigot, are of opinion that the ancestor of the Indian Tiger is the Siberian one and certainly in Assam the large size of same, preponderance of white and long hair bears this out. The Manipuri name is *Kiejou*.

Compared with the Lion the Tiger is a much finer animal in every respect. His wonderful colouring, his movements, his ferocity and pluck make him an object of admiration. On the move the body assumes sinuous or snakey movements, and each paw is brought down in a deliberate manner. Then to see him spring, making great leaps of

twenty-five and thirty feet in the horizontal is a sight for the Gods. Curiously enough he cannot spring up any height like the Panther, and a net seven or eight feet high will serve to confine him. His strength is enormous. I have seen a Tiger drag a full sized buffalo several hundred yards. His movements are like a flash, seen when he has been missed or when he snatches away a "kill", that would take a man to drag, with the same ease as a cat carries away a mouse. I have seen this several times, so the hunter must never relax his vigilance when sitting over a "kill". The Panther is a skunk, the Tiger not so. A Tigress will defend her cubs to the very last, and often if a cub is shot she will have her revenge or do her best to recover it. S. of Golaghat, during a flood, bagged four tigers on a *chur* of the Brahma-putra, the Tigress escaping. Next day the servants came to say that there was a Tiger in the compound! S. sallied forth and bagged her.

The Tiger is widely distributed throughout India and Burmah. Tigers are to be found in most places where suitable forest or large tracts of grass jungle are found but absent in Baluchistan, Cutch, Lower Sind and Ceylon. I should say that no province holds more Tiger than Assam. In Orissa there were many at a place called Angul, and several of these turned man-eaters. Tigers are numerous in the Dooars, especially in the Jalpaiguri district. H, a great shikari during his stay in these parts bagged, I believe, 65 Tigers. When I was in Sylhet, some years ago, there were many Tiger in the North-West corner of the district, and at Jairtiapur. But they were sadly diminished by hosts of gipsies who used to come up during the rains in boats to trap and poison them. Most of these skins used to be taken back to their district for the reward, and the authorities were none the wiser! The other places in Assam where Tiger were numerous, were the Nowgong and Gauhati districts and in Dhubri. In the last place huge bags have been made with the help of elephants.

In the Sunderbund Tigers were, at one time, very numerous, but with many emigrants settling and increase in navigation they are not so numerous. Many people,

including myself, going to Assam by the Sunderbunds steamer service have seen Tiger on the banks of *khals* and Mrs. M. told me that once when coming up a creek three Tigers swam a *khal* just in front of the prow of the vessel, and no one on board had a rifle! Sitting on the deck one day, with my wife, just as the sun was setting we saw a Tiger emerge from the jungle downstream. It came for a drink. I rushed into my cabin, got my rifle and had a shot. I forgot to allow for the movement of the vessel, and my shot threw up the sand a few feet beyond the beast, and he disappeared like a flash. Many of these Sunderbund Tigers were man-eaters, and did not hesitate to carry off men from the boats moored near the bank, and many a woodcutter and fisherman has never returned to his homestead. I do not know whether any European met with his death in this way, as shikaris from Calcutta were always going to Saugor and elsewhere to bag Tiger; B., a well-known shikari in Assam, told me that he had bagged 35 Tigers in the Sunderbunds. The places where men had been killed were marked with a red flag, I have seen these; they were put up to warn others. In the *khals* of the Sunderbunds there were numerous Crocodiles sunning themselves on the bank, and the searchlight on the prow at night showed up herds of Chital on the bank. It was great fun shooting the Crocs, although few were recovered; some of them, when shot, raised themselves in the air and emitted a bellowing sound. I would strongly recommend this trip. The whole route is interesting and exciting.

All my Tigers have been bagged in Assam and during my 34 years in India I have bagged seventeen. Assam is an ideal country for Tigers—long rivers with numerous *churs*; heavy grass country, with patches of thick forest, game fairly plentiful and thousands of tame buffalo, and cows to prey on. They cause great destruction to cattle sometimes knocking them over by fives and sixes just for sport and to teach their cubs. In many cases herdsmen have to shift their quarters owing to ravages wrought by Tigers.

I have come across Tigers in all sorts of country—in grass jungle, in grass jungle interspersed with patches of forest, in ravines and in mountainous places, where I have seen their tracks at an altitude of 6,000 feet. If I am right, a Tiger suddenly made its appearance at Tonglu, on Singalila range opposite Darjeeling, elevation 10,374 feet. One was shot by an officer of my regiment at Shillong on the parade ground! The small *tilas*, or hills, with jungle in between with swamps, not far from the Tezpur Tower held many Tigers, and whilst after small game we always took our rifles, and very often a Tiger was included in the day's bag. Here, twice whilst I was after Florican, on foot, I put up a Tiger, which fortunately bounded away; another was peppered by G. with No. 8 shot!! whilst after small game. Tigers are often found in caves, but we have none of these in Assam, except at the Kopili. These are inhabited by Bears.

Wherever the Tiger is found there must be water. He hunts by day, as well as at night, if a cattle killer usually the former and if a game killer the latter. After a meal he has a drink and, if the surrounding jungle is favourable, will lie up in some cool place within 300 yards of the kill. I have often come on their seats and one knows, if the ground is hard, that it is that of a Tiger from the shed hairs in the seat. He is a strong swimmer, and in hot weather will immerse himself in water. In the water the head is raised high, and is constantly shaken to get the water out of his ears and on reaching the bank he gives himself a good shake like a dog and departs. Tigers have been known to swim the Brahmaputra when in flood.

They dread jungle fires, and with the Wild Pig, soon make tracks out of it. There is no doubt that Tigers, except man eaters, are shy and avoid man, but at times they get very bold. In Tezpur one walked along the Ex. Engineer's Bungalow verandah at night, it had been freshly cemented and the pug marks were unmistakable. I shot one at Tezpur not 50 yards from my gate, as will be related later. At Haflong one took away a pony feeding on the golf course,

and one Tiger, which I never bagged, used to enter the buffalo sheds at night and kill, he once mauled a herdsman very badly, when he went to investigate what was up. The Tiger is much more cautious than a Panther, and if fired at, and missed, from a *machan*, becomes very cunning. He will kill, have a meal, and never return, hence so many blank nights in sitting up over kills.

In Tezpur, in broad daylight, a Tiger pounced on a horse that was being led to Behalighat for a *dak*, and in Nowgong a tea planter and his wife, driving in a buggy from the Club, had the horse killed. Man eaters get very bold, as readers may remember in my article "Man eaters of Langting". At Kaitamabi, not far from Manipur, a man eater used to bite or tear away the sides of the grass huts, in which the coolies working on the telegraph line were lodged, and bag his victim. The C. O. of my regiment, and myself, were just about starting to try and slay him, when a Naga brought in the head and skin to Manipur for the reward. This Naga, it appears, after fortifying himself with *Yu*, a strong liquor, sat behind a bush, close to the corpse, and killed the Tiger by hurling a poisoned spear at him. I think almost everyone has heard or read about the adventure of 'Tiger Barry', a tea planter, with a Tiger. I will not go into details, suffice it to say that, on our way to Shillong, my C. O. and I had lunch with him in the very bungalow where the incident happened and we heard the story from his own lips. Whilst all three watchers fell asleep in long chairs Barry felt something seize his hand; he offered no resistance knowing that, if he did, the Tiger would inflict more serious injuries. When the Tiger led him on to the lawn he shouted for help and one of the men fired at it and it dropped him. He recovered with a maimed, contracted hand. Barry told me that what impressed him most was the smell of that Tiger and this had so impressed itself on the olfactory nerves that he could always tell where a Tiger had been or passed.

As is well known, for some reason or other, Tigers cannot climb trees, but a sloping tree is often taken advantage of to get a good view. In Tezpur, on the edge of the

Bheel, covered with long grass, there was a sloping tree and, apparently, this was used by a Tiger, as a look-out for game etc., as I found wet clay fairly high up with hairs of a Tiger in it. The man-eater of Kharupatia, who nearly got me, used to get up a sloping tree, and if he saw a solitary milkman proceeding to the river ghat, grabbed him. He would never attack if there was more than one man. The Tiger has a curious habit of sharpening his claws, almost daily, against a tree usually a *seemul*, hence accounting for his clean claws. The natives say that they select these trees because they like to see the reddish sap, like blood, ooze out. By observing the claw marks the hunter can obtain valuable information of the presence or whereabouts of a Tiger.

The manner in which a Tiger kills his prey is a disputed point. The upward blow of the fore-arm, favoured by the animal throwing back the head producing dislocation of the spine, is the general belief. This is wrong. After examining many kills I have come to the following conclusion. The Tiger springs on his victim's side, or flanks, holding on with his powerful claws and his main object is to paralyse the beast by biting deeply into the spine in the cervical, dorsal or lumbar regions and deep wounds made by the canines are always seen. The weight of the Tiger, something like 450 to 500 pounds, helps, also, to pull the animal down. The horns of a buffalo or bison are of no use with the Tiger in this position. I have seen, in some cases, a piece of flesh bitten clean away and, into which, you could put your two fists, this can only happen in the regions of the neck. If the animal is a very large one, or a horse, the Tiger, galloping behind, tries his utmost to hamstring the animal by biting through the *lindo achilles*, after which the animal is at his mercy. I have often, when following up a track where a buffalo had been chased, come upon the tuft of the tail, which had been seized by the Tiger and torn off. I shot a very old solitary Bison in whom there was not a vestige of a tail, his flanks had deep scars, and I came to the conclusion that this was the work of a Tiger. Also, sometimes, in the attempt to hamstring the animal the beast is emasculated. As regards human victims, I have made *postmortems* on

several cases. In almost every case the man has been seized by the chest. There were two deep wounds in front and two behind, caused by the canine teeth. In one case the scalp of a beater was torn down over his ear and in another, a *goala* herdsman, the face and arms were terribly mauled. In the last case a Tigress, with two cubs, attacked without provocation. The man was bringing in milk to Haflong, armed only with an umbrella, and while walking along a jungle path he met the Tigress and her two cubs which dashed away into the jungle. I suppose the cubs got separated from the mother. The man walked on and was suddenly attacked. He beat off the Tigress with his umbrella and came into Haflong for treatment. After six months in hospital he recovered with the loss of one eye and one side of his face much scarred. The man-eater leaves only the feet, hands and skull of his human victim. In the North Cachar Hills the relatives and friends organise and do all they can to recover these remains to be buried near the man's village. They say that if they are not recovered the man's ghost will always haunt the village.

Valuable information can be gleaned of the kill of a Tiger or Panther by :—

1. Observing a flock of vultures sitting in a tall tree, especially if one by one they fly and settle in the jungle, when the kill is easily found.
2. By observing vultures taking the same line of flight. If you are certain there has been a kill, and the vultures do not stir from the tree, ten to one the Tiger is at the kill.
3. A flock of vultures suddenly rising from the jungle. This is caused by the Tiger making rushes at them to drive them off. He generally drags his kill into thick jungle, where the vultures cannot get at it or see it.

A most extraordinary thing happened at Haflong. Khubber was brought to me that a Tiger had killed a horse about two miles from the station, so I proceeded to the spot

and followed up the track where the animal had been dragged. The first drag had been through scanty scrub, and I noticed a lot of the hair from the horse's tail wrapped round the branches of bushes, where it evidently had got entangled; then just before the Tiger got the kill into heavy jungle, I found the tail, itself, bitten clean through. I surmised that the Tiger thought that the tail was impeding progress, and so got rid of it.

On another occasion, in order to make sure that the Tiger would not snatch the kill away suddenly before I could fire, I bound a strong thin wire cable to one of the hind legs, and fastened the other to a stout pole, driven deeply into the ground. A cloud obscured the moon during the night watch, from my machan, and the Tiger pounced on the kill, and pole wire etc. disappeared before I could fire. Next day I went to look for the kill and there, about thirty yards from the spot, was the hind leg bitten off and still attached to the pole by the wire. The Tiger's efforts were impeded by the pole and wire, which got entangled in the jungle, so he had got rid of them by biting through the leg to which they were attached; the kill was then found in a deep nullah several hundred yards away. This Tiger was a huge brute and very cunning and I do not remember how many times I had been after him without success. As he was doing much damage and at the request of the magistrate, I had to poison him with much regret.

The Tiger drags his kill backwards, and not like a cat does a rat, as depicted in some illustrations. This is because he can exert full muscular action, and especially his weight aiding him. But not always does weight come to his aid, as I have seen a Tiger drag a full-grown cow up a hill with a 45° gradient for some distance. Where a kill has been dragged one can always see the marks and scrapings of the Tiger's claws on the ground and the earth torn. So from all this one can conclude the enormous strength of a Tiger. All the Tiger's senses are very acute, especially that of hearing. One has only to examine the dried skull of a Tiger to see the enormous development of the *tympanic bullae*, or the under surface of the temporal bone to realise this.

Inside this is the organ of hearing; the ears are comparatively small but cup-shaped to receive all the vibrations of sound; the whiskers are not for adornment only, being supplied with large nerves and serve to make him aware of obstacles, thorns, etc., when moving through the jungle at night. The eye has a *tapetum* like the Panther and with a light thrown on it, glows like an emerald or a glow-worm. The sense of smell is very acute and the ethmoidal sinuses in the Tiger's nose are very large. His coloration is so well-known that I need not describe it but no two Tiger skins are alike in markings, and those about the forehead and on the tail vary very much. The colour of the Tiger in the hot plains is much lighter than that of animals shot in hilly country or in thick forest, the bleaching action of the sun causes this and with age and in preserved skins the colour gets paler. Many of these pale Tigers have been described as "White Tigers" or albinos. This is a mistake, for a Tiger to be a true albino must not have any vestige of a stripe, and the iris must be blue. I saw, exhibited in a taxidermist's shop window in Calcutta, a so-called White Tiger. Certainly the stripes were fewer than that of the average Tiger but it was not an albino; the only albino Tiger, that was ever shot, was obtained in Assam, where many people saw it. The Black Tiger (melanistic variety) is also rare. I think Dunbar Brander mentions an authenticated instance where such a Tiger was obtained in the Central Provinces; Many more of these varieties would be obtained, were it not for the fact that they are destroyed, and probably eaten by the mother, when she sees the monstrosity in the litter. The length and thickness of the tail vary very much; some have short thick ones, others long and narrow. The under-parts of the Tiger are white with stripes and behind each ear there is a round white spot. It is important to note this, as on a fairly dark night one can see the spots, although the body is not distinct also, sometimes, when a Tiger is chary about coming up to a kill, he moves about some distance from it and, if he sits up on his haunches, gazing at the kill, he looks just like a white pillar, offering a target to the hunter. When galloping over fairly

hard ground his pads make a thudding sound which can be heard at a considerable distance.

The size of the Tiger can be judged by the size of the pug marks; that of the male is larger and more rounded than that of a female; in clay or sand they are very distinct, but in grass and hard ground difficult to see, so one must trust to other signs, blood etc., when tracking. The canine teeth are very strong and long, conical at both ends. In the law courts, situated amongst the wild tribes, Nagas, Kukis etc., the oath is always taken by a witness in this way. He takes the canine of the Tiger, places it between his teeth and bites it, after this he says: "If I do not tell the truth may a Tiger kill and eat me!" The teeth are subject to decay and in an old Tiger they get, especially the canines, worn, yellow and broken. The skin of a Tiger or Tigress in their prime has a sheen like a race horse, and one can hardly find a tick on them. In an older animal the hair is short, rough and mangy and one that was shot by the magistrate of Haflong had hundreds of ticks on him, which I have good reason to remember as I helped to skin him and had to scrape off the ticks, swarming up my arms, with the skinning knife; four days afterwards I found one like a grape on my chest and removed it with the help of carbolic oil and a forceps.

The cry of a Tiger when courting, or when separated from the Tigress, is a sort of booming noise repeated several times succeeded by *woof woof woof* rapidly uttered but when he changes he utters a roar. A Tigress, separated from her cubs, makes a plaintive mewling sound. I have often compared the booming sound to that produce by a Burmese gong heard at a distance. Does the Tigress produce this sound? The Tiger, when on the prowl, hates going into unbroken or very thick jungle on account of the softness and tenderness of his pads, and follows the paths of animals or even along Government roads.

(To be continued)

Preparing specimens of Small Mammals other than Bats.

By

C. PRIMROSE.

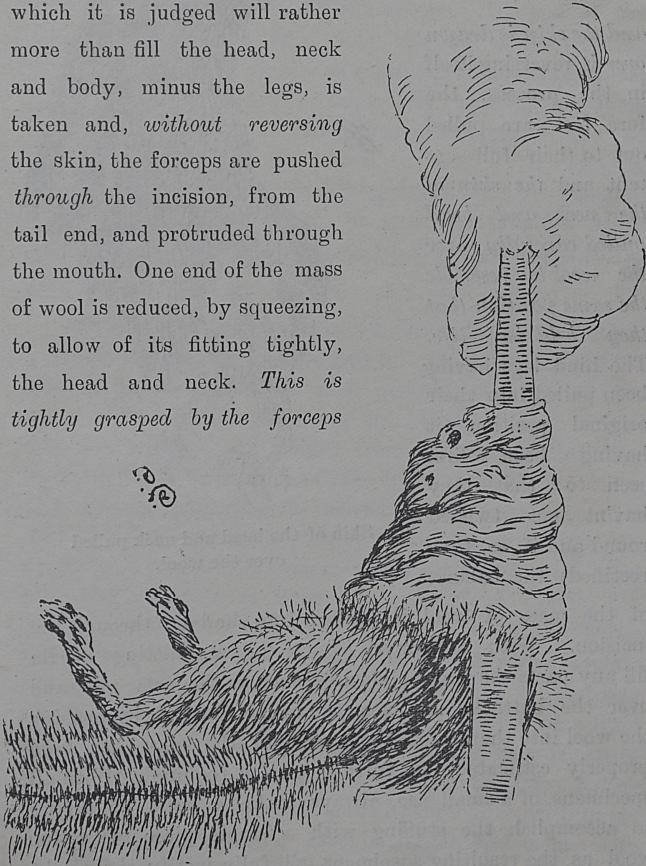
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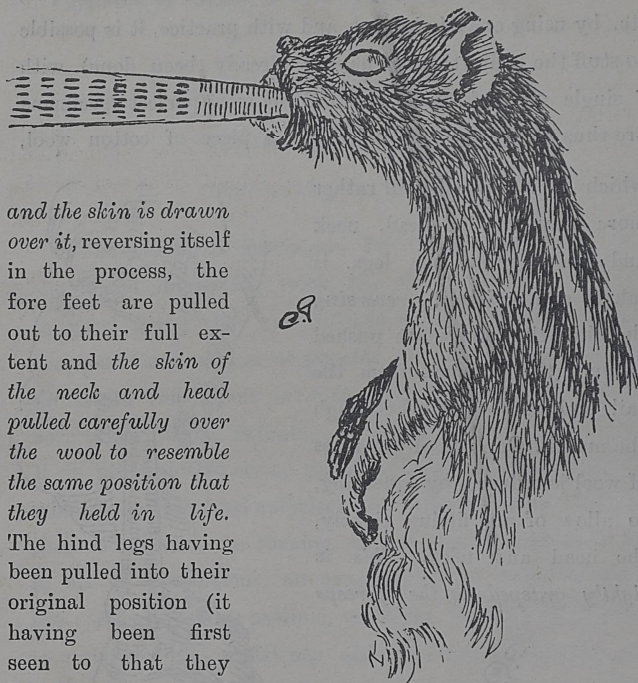
The stuffing of specimens, for Cabinet purposes, is a simple and interesting work, the chief point to be borne in mind being that the finished specimen should be, in all its proportions, as near as possible to what it was in life. To attain this result is quite easy provided due care has been taken, when skinning, to avoid stretching the skin. It is preferable to err on the side of under, rather than over stuffing, but provided sufficient care is taken when stuffing, there is no excuse for turning out any specimen that is not, in all its proportions, an exact replica of what it was in life. As with every pastime, or hobby, practice is required in order to get proficiency and the time required to gain this will depend both on the amount of practice put in and on the natural talent which the Collector may possess. Of the last very little is required provided he remains, at all times, determined to produce specimens only of the very highest standard. Compared with birds he is dealing with very simple material and perfection is easily attained.

Now with Bats there was only one opening, the month, through which the cotton wool used for stuffing, could be introduced into the skin, but here we have the incision down the belly as well. Before commencing stuffing all shot holes should be carefully sewn, from the flesh side, broken bones mended, as instructed under Bats, and wrapped with wool to the size of the muscle removed.

In the case of the very small Mammals, Mice, Shrews, etc. by using one's judgment, and with practice, it is possible to stuff the body (the legs having already been done) with a single piece of cotton wool and the most perfect specimens are thus turned out. To do this a piece of cotton wool, which it is judged will rather more than fill the head, neck and body, minus the legs, is taken and, *without reversing the skin*, the forceps are pushed *through* the incision, from the tail end, and protruded through the mouth. One end of the mass of wool is reduced, by squeezing, to allow of its fitting tightly, the head and neck. *This is tightly grasped by the forceps*



Wool grasped by forceps, preparatory to skin being drawn over it.



and the skin is drawn over it, reversing itself in the process, the fore feet are pulled out to their full extent and the skin of the neck and head pulled carefully over the wool to resemble the same position that they held in life. The hind legs having been pulled into their original position (it having been first seen to that they hav'nt got twisted round and if so, then rectified) the balance

Skin of the head and neck pulled over the wool.

of the mass of wool is tucked into the body through the incision. With a bamboo skewer or a knitting needle fill any parts showing hollowness, such as the arm pits and over the buttocks and near the root of the tail, by pushing the wool into them and, if the size of the mass has been properly estimated, no further wool is required. With all specimens, of a small size, always make a habit of trying to accomplish the stuffing with a single piece of cotton wool as the resulting specimens will fully justify the slight amount of extra care and judgment required to do so.

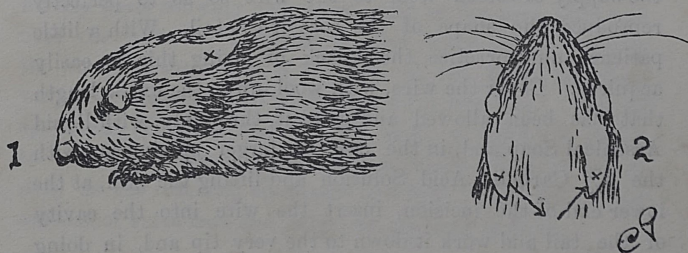
With specimens of medium size this is not practical so it is best not to attempt to do more than fill the head, neck

and chest with a single mass of wool. This is brought into position by the same means *viz.*, by grasping one end firmly with the forceps, which protrude through the mouth, the skin being then reversed over the mass. The grip of the forceps, on the wool, should, of course, not be relinquished till the skin has been pulled into position over the head and neck and made ship shape, Bristol fashion. The rest of the body should then be filled, with the aid of the knitting needle, so as to, as nearly as possible, resemble the animal in the flesh. Care should be taken that, whilst overstuffing is avoided, the skin is filled firmly throughout and no hollows left in the arm pits, rump or base of the tail. A considerable amount of modelling can be done by squeezing and patting and this should be carefully attended to in order to make the shape and proportions, of the specimen, as life like as possible.

When quite satisfied that you have reproduced these perfectly the tail can be attended to. Draw the skin of the tail out to its full extent and, selecting a gauge of wire which is thin enough to allow of its being inserted to the very tip, measure the length from the tip (not including the hair) to the forward end of the incision; allow an extra inch or more according to the size of the specimen and cut the wire. Straighten the wire by manipulating it with the fingers and pliers and then tease out a piece of cotton wool with one end into a few fibres and press these against the wire turning it round, in one direction, between the finger and thumb of one hand while with the other you regulate the supply of cotton wool to the wire so as to perfectly reproduce the shape of the core of the tail. With a little patience and practice the knack of doing this is easily acquired. Cover the wire, with wool, up to the extra length that has been allowed and paint it, thoroughly, with liquid Arsenical Soap and, in the case of larger specimens, with the 5% Carbolic Acid Solution and lifting the skin, at the lower end of the incision, insert the wire into the cavity of the tail and work it down to the very tip and, in doing so, see that the skin of the tail does not get twisted but is as it was in life.

Owing to the extra length of wire which was purposely allowed it will not be possible to insert it into the incision. Measure it, against the head end of the incision, and allow an extra $\frac{1}{4}$ or $\frac{1}{2}$ inch, fold the wire back on itself, lift the skin and insert the folded end under it and the specimen will then be ready for stitching. With a fine needle and thread sew the edges of the incision together, starting from the tail end, and using a simple criss cross stitch, always pressing the needle through, from the flesh side, and seeing, with the aid of a sharp point, that no hair is folded under the stitches, stitch right up to the end of the incision and then, neatly and finely, knot the thread; then do the same to the mouth, starting from one corner and ending at the other, except with Rodents. In these the formation of their mouths render the following method most simple; from the fur side pass the needle through the lower lip, slightly to one side of the centre, then pass it through the lobe of the upper lip, directly above, and from the flesh side; then across and through the opposite lobe, from the flesh side, and then through the lower lip also from the flesh side, directly below, and draw all taut and knot. With these cleft-lipped species this method is the neatest and most simple.

In the case of Rats, Mice and Hares, whose membraneous ears cockle up and so completely spoil the appearance of the specimen, they are dealt with thus:—Take the ear, on one side, and fold it down its length with the inner surfaces together and the outer edges exactly corresponding; then *pass the needle and thread through* from the outer side and



Method of stitching ears of Rats and Mice.

1. Side view.
2. Seen from above, showing direction of stitches.

through the skin of the nape; then holding the other ear, folded in a similar way, pass the needle through from the inside and, pressing both ears against the neck, draw the thread taut and secure by a simple knot. The illustrations will, I hope, enable my readers to clearly grasp how this is done. The ears of all other Small Mammals are left to dry, in their natural position, being manipulated, in the process, to guard against any tendency to cockle or twist.

These points having been attended to the, presumably, blood-stained specimen is now ready for the cleansing process. First get about a pint, or more, according to the size of the specimen, of warm, clean water and dissolve in it a tea spoonful of common salt. Moisten a pad of clean cotton-wool in the water and, working from the head towards the tail, wipe the fur with the pad, dipping it in the water, and squeezing out the blood from it, after every few strokes. After it has been squeezed out a few times take a clean pad and continue the washing process until no trace of blood is seen on the pad after wiping any portion of the specimen. Should the water get much discoloured, in the process, replace it with clean water and keep on sponging *till every trace of blood has been removed*. Now sprinkle the sodden specimen thoroughly, with clean sand and continue to do so till no more sand will adhere to it. Place the specimen in a shady, airy spot to dry during which process a good deal of the surface sand will drop off. Examine the specimen; after sometime, and when, on shaking it gently, every grain of sand drops off, it is ready for the finishing touches.

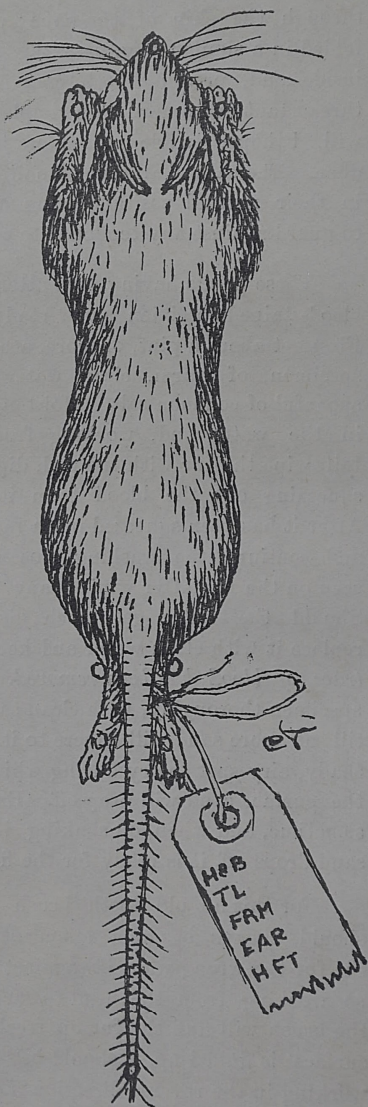
For this an old tooth brush will be found ideal and should always be kept among the skinning gear. Brush the fur the wrong way, *i.e.* against the natural lie, and do so working from the head towards the tail. Light dabs of the brush will fluff the fur up freely and, when the whole surface is fluffed up, it should be brushed into position again working in the reverse direction, *i.e.* from tail to head, and finishing by stroking, gently, with the fingers.

If the instructions have been properly carried out the specimen will show no signs whatever of blood stain or

damage and will be very hard to distinguish from one that was killed with a minimum of damage.

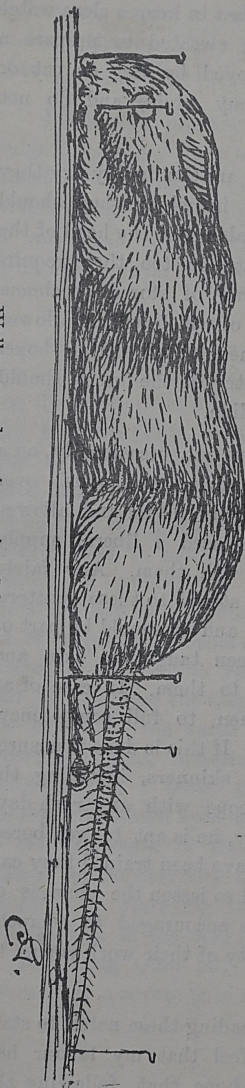
All that remains to be done now is to set the specimen on the soft wood board kept for this purpose and to allow it to dry thoroughly before transferring it to the store box. Copy into the Journal the data and measurements entered on the slip, as well as on to the label, which should be firmly attached to the right hind leg of the specimen.

Now *pin it on to the board as in the illustration* and place it in a shady place to dry. This will take from 12 to 24 hours, or more, according to the temperature and humidity of the atmosphere. When the upper surface is dry, which can be tested by feel, the specimen should be carefully unpinned and turned over on its back to



Well prepared specimen pinned for drying seen from above.

Well prepared specimen pinned for drying side view.



allow of the underside drying thoroughly. The skull, which should have been cleaned as mentioned under Bats, should be dried at the same time and the ears, except when dealt with as in the case of Rats and Mice, manipulated so as to keep their shape.

As mentioned, earlier, the specimens should be carefully protected from damage or destruction by insects or animals; ants can, where numerous, be a serious source of trouble and should always be guarded against powdered Naphthaline or Turmeric placed round the specimen, in the form of a low ridge, about $\frac{1}{8}$ " in height by $\frac{1}{4}$ " in breadth, acts as an efficient protection as I have proved in practice; but, of course, if the Collector can discover a cheaper and better way he should use it but, at all times, "ware ants". The ears, nose and tail are their chief points of attack and they can destroy these in a very short time indeed. Pi dogs and cats are the chief animal culprits, carrying the specimen off bodily and

tearing it to pieces and Crows and Kites will do the same if given a chance. It is wise, therefore, to cover the specimen with a wire mesh dish cover and, at the same

time, to employ a trustworthy *chokra* to keep a close watch on it. It is sickening, after having sweated to prepare a perfect specimen, to find it destroyed by dog or cat or severely damaged by ants, so take my advice and do not wait to learn by bitter experience.

When the specimen, and skull, are thoroughly dry they can be transferred to the Store box in which they should be neatly pinned with the skull alongside the head of the specimen. Remember, however, that, here too, they require to be protected from the chief enemy of stored specimens *viz.*, the *Dermestes* beetle, the *larvæ* of which will, if allowed to, irreparably damage the specimen. Well fitting boxes which will effectively prevent the entry of the insect should be used and kept reeking of Naphthaline.

The specimen should be taken out, occasionally, on a bright sunny day and given a good airing and brush over and the Store boxes emptied thoroughly, fitted and allowed to air. When the specimens are replaced a liberal supply of Naphthaline should be put in with them. Any fairly intelligent servant can be trained to attend to these matters, under the Collector's supervision, and it should be part of the duty of the man who has been taught to skin and prepare the specimens to attend to them. In case of an accident it is wise to train two men, to full competency, so that one is always available. If this is done it ensures three, or if one is off duty, two skinners, including the Collector, which is sufficient to cope with any rush day. If one man is kept at it continuously, he is apt to get bored and his work suffer but if two have been trained they can each be given an occasional rest and so lessen the chances of their getting stale. They can be encouraged to compete against each other and the quality of their work is sure to improve.

If any one is encouraged, by reading these notes, to start collecting Small Mammals I shall feel that my labour has met with ample reward, and I hope that, following the advice I have given, the Collector will, continually, strive to improve the specimens in his collection and, in his

endeavour to do so, will use his brain to think of any methods that are likely to make this possible and put them through a practical test.

He should procure as many books as he can on the subject and study them with a view to learning all he can about it. I greatly regret that being ignorant of the bibliography, on this subject, I am unable to give the names of any such books. Any first class firm of book-sellers will, however, be able to do so.

Now, although the Collector will find it fairly difficult, even in this day of sub-specific worship, to find even a sub-species new to science, he can discover a great deal concerning the habits of the Mammals of his District, which has not been recorded, so let him spare no pains in studying, and accurately recording, the habits of all the species that come under his observation. A special note book should be kept for this purpose and all details of habits carefully entered into it and notes, on such observations, sent to the Editor for publication as they would be of interest to Members and would also help the Editor in his difficult job of keeping the covers of his excellent little Journal apart. Accurate observation requires concentration, perseverance and patience and the fact that, by such exercise in studying the habits of the small Mammals of one's vicinity, and recording them, material of value to Science is being collected will, I trust, lead every Collector to observe the habits, of potential specimens, carefully. It will enable him to see the truth of the Koran's expression. "Allah be praised for the diversity of his creatures," and so pass a happy hour observing them which, if spent at the Club, would result in his suffering from that painful complaint an ingrowing Club bill which, when cured, is, invariably followed by a severe pain in the pocket !!

Some Notes on the Cobra (*Naja naja.*)

By

P. E. BARKER.

A great deal has been written about this snake already and it, naturally figures largely in any book on Indian Snakes. If it only figured there, in the works in question, one would believe nearly everything one reads about it, but it seems to have an irresistible appeal to novelists, writers of detective stories and popular travel books so that one may acquire a mine of quite unreliable information about this snake from these works.

There are several curious legends about the Cobra.

I. That all Cobras are females and that the Dhaman is the male Cobra.

II. That a Cobra's hearing is far more acute than that of any other snake and that it likes and is attracted by music.

III. That a Cobra can outpace a galloping horse.

IV. That Cobras are very fond of milk and drink it in preference to water.

Let us examine these various legends in order.

No. I. is beneath contempt and it is amazing how it has ever gained credence. It would be just as sensible to suggest that all Tigers are of the female sex and that the Leopard is the male Tiger; nevertheless this rumour was revived in the "Statesman" a year or two ago and was even considered worthy of discussion by "Kim" of that paper.

It is not too easy to sex snakes but, if it is done, plenty of Cobras, of both sexes, will be found though females are supposed to be slightly more plentiful than males.

No. II. This, of course, is the old fallacy of the snake charmer. People tend to believe that because snake charmers blow a sort of Asiatic penny whistle, when charming a Cobra, the snake is dancing to the music. It is not, as it cannot hear it. Snakes have no external ear and can hear

no sound which is carried by the air alone being only sensitive to sounds transmitted by solids, with which they are in contact or by water if they are in, it. A snake charmer's music is just bluff or, possibly, advertisement.

I, once, saw a coolie playing with a Cobra he had caught that afternoon. He had, in his right hand, a piece of 3 ply wood, a little less than a foot-square, which he was holding by a piece of string looped through two holes, about 4" apart, in the centre of it so that his hand and forearm were protected by the board. This he waved slowly, from side to side, in front of the snake which was swaying in time to the motion, while his friend sang a monotonous chant beside him. Tho Cobra was obviously fencing for an opening and, indeed, it struck once and only damaged its nose on the board. The man said he could not make it dance if the singer stopped but I took the board and the Cobra performed just the same for me without any, so-called, music. This Cobra was an exceptionally fine one, a binocellate female of 5 ft. 5½ inches as nearly as I could measure it alive, for the owner would not hear of it being killed nor would he sell it to me? It bit him twice that evening but only grazed his hand each time and, except for a swollen hand, he was no worse.

Col. Wall once blindfolded a Cobra with sticking plaster and it took no notice when he blew a bugle close beside it but, immediately, erected itself when anyone walked along the verandah, as it could hear the foot falls through the boards.

No. III. Different species of snakes can move at different speeds and the Cobra can, certainly, not be the most active found up here. A Dhaman is far faster and, over ordinary ground, anyone can catch up with one, but it must be remembered that the rougher the ground is the faster a snake can move as its ventral scales are afforded a better grip and a snake is almost helpless on wet, smooth concrete as it suffers severely from wheelspin and, through wringling violently from side to side, makes little real progress. Actually, though it would be almost impossible to time a Cobra over a given distance, any

estimate can only be a guess. I should say a Cobra could not attain 6 miles per hour and a Dhaman not 8 miles per hour. A galloping horse could do 25 to 30 miles per hour. I only base these figures on having, several times, chased and caught both of these snakes and having once been attacked by a King Cobra which seemed about as fast moving as the ordinary one.

No. IV. One always reads of pious Hindus propitiating Cobras with saucers of milk but the experience of those who have kept snakes alive goes to show that they never drink milk. Nicholson (*Indian Snakes p. 130*) says:—“have never succeeded in inducing a snake to drink milk, though, when water was afterwards offered it drank eagerly.” Fitzsimous (*Snakes p. 172*) says:—“Snakes never drink milk. From time to time for years I have placed dishes of milk in the snake park; but no snake ever even sips it. True on a hot day they will sometimes wallow in it or wriggle through it. Even when water is withheld our snakes still refuse to take milk and in its presence they actually die of hunger and thirst.”

I, myself, have never kept a live Cobra but have kept most of the commoner harmless snakes of the Dooars and never saw one take the slightest interest in milk though they drink a great deal of water for their size.

It is, of course, a physical impossibility for a snake to suck milk from a cows' udder, its mouth is not adapted for it.

[In the very first number of our Journal there was a short paper by Mr. G. E. Shaw entitled “Can snakes hear?” He showed that in all animals” credited with hearing at all have some kind of an ear drum, even if it is only their ordinary skin stretched across a ring of bone, as in frogs and some lizards”. There is no external but, dissection shows, a modified inner ear that has no connection with the outer world at all. He suggests that the snake is fascinated by the swaying motion of the Charmer through the medium of its eyes. *Editor.*]

MISCELLANEOUS NOTES.

The Lepidoptera of Peshoke, December 1936.

The following notes are based on material collected at Peshoke between the 20th December 1936 and 2nd January 1937.

Day collecting was fairly productive but light, on which I was relying for *Heterocera*, was an almost complete failure. This was probably due to the bright moonlight as on the last three evenings, when the moon was rising later and had begun to wane, a few moths were attracted. Moths were, I think, fairly numerous as I found numbers of wings in spiders webs and odd specimens were taken at rest.

Larvae were abundant but I had to content myself with those that were full fed as it is impossible to obtain the necessary foodplants in Calcutta. Most of these have pupated successfully but are still unidentified and I hope to publish a supplementary paper giving their names and also those of the imagines that I caught but have so far been unable to identify.

Longstaff in his "Butterfly Hunting in Many Lands" records a visit to Peshoke in late December 1903 and I have marked the species caught by both of us with an asterisk and also added the names of the species, caught by Longstaff but not by me, in brackets.

As regards nomenclature, I have followed Evans, "Identification of Indian Butterflies" second edition for the *Rhopalocera* and the Fauna of British India, Moths as far as possible for *Heterocera*.

RHOPALOCERA

Papilionidae

- A 3/5 *Chilasa clytia clytia*, L. One larva, which died.
(A 4/2 *Papilio memnon agenor*, L.)
A 4/25 „ *polytes romulus*, Cr. One male and one female f. *stichius*, Hbn.
A 6/2 *Zetides sarpedon sarpedon*, L. Common but worn.

Pieridæ.

- *B 4/10 *Pieris canidia indica*, Evans. Common. Pupae in numbers on the P. W. D. Resthouse.
- B 6/11 *Delias descombesi leucacantha*, Fruh. Two specimens.
- B 6/13 „ *thysbe pyramus*, Wall. Two specimens.
- B 7/1 *Prioneris thestylis*, Db. Common, only males caught.
- (B 9/2 *Huphina nerissa phryne*, F.)
- B 9/3 „ *nadina nadina*, Luc. Males common, females scarce.
- *B 10/2 *Appias lalage lalage*, Db. Common, mostly females.
- (B 10/3 „ *indra indra* Mre.)
- B 10/5 „ *lyncidu hippoides*, Mre. Common, mostly males.
- B 11/2 *Catopsilia pomona*, F. Uncommon.
- B 12/ *Gandaca harina assamica*, Mre. Not common.
- B 15/1 *Terias libythea*, F. Not uncommon.
- *B 15/2 „ *laeta sikkima*, Bsd. Common.
- B 15/4 „ *blanda silhetana*, Wall. Very common. Also larvae.
- *B 15/5 „ *hecabe hecabe*, L. Very Common. Also larvae.
- *B 17/2 *Ixias pyrene pirenassa*, Wall. Common mostly males.
- B 19/ *Hebomoia glaucippe glaucippe*, L. Two seen but not caught.

Danaidæ.

- (C 2/1 *Danais aglea melanoides*, Mre.)
- *C 2/4 „ *melaneus plateniston*, Fruh. Not uncommon.
- (C 2/5 „ *tytia tytia*, Gray.)

- C 2/12 *Danais pleaxippus*, L. One female.
*C 3/1 *Euploea mulciber mulciber*, Cr. Not uncommon.

Satyridæ.

- D 2/3 *Mycalesis anaxias semate*, Fruh. Not uncommon.
D 2/10 „ *mineus mineus*, L. Very common.
*D 2/12 „ *visala visala*, Mre. Very common.
(D 3/22 *Lethe rohria rohria*, F.)
D 3/25 „ *confusa confusa*, Aur. Not uncommon. Very worn.
D 3/38 „ *kansa*, Mre. One female.
(D 3/43 „ *verma sintica*, Fruh.)
D 3/48 „ *bhadra*, Mre. Common but very local. All my specimens were caught on one tree.
(D 14/14 *Ypthima philomela*, Joh. This is probably incorrect as it is a Southern Indian species.)
D 14/15 *Ypthima baldus baldus*, F. Common.
D 16/ *Orsotrioena medus medus*, F. Common. The form with the white discal line (f. *hesione* Cr.) outnumbered the one without (f. *turbata*, Fruh.) by about four to one.
*D 22/1 *Melanitis leda ismene*, Cr. Very common. I took a long series, some of the forms being very well marked.
D 22/2 *Melanitis phedima bela*, Mre. Common. Some of the females resemble *M. zitenius*.

Nymphalidæ.

- F 2/2 *Eriboea athamas athamas*, Dr. Common but worn.
F 8/ *Herona marathus marathus*, Db. One male.
F 12/ *Hestina nama*, Db. Not uncommon.
*F 18/6 *Euthalia julii appiades*, Men. Females common but worn.
F 21/ *Lebadea martha martha*, F. One female.
(F 25/4 *Pantoporia selenophora selenophora*, Koll.)
(F 25/10 „ *ranga ranga*, Mre.)

- *F 26/6 *Neptis hylas astola*, Mre. Very common.
 (F 26/6 ,, ,, *varmona*, Mre.)
 (F 26/ ,, ,, *aceris*, Cr. A mistake as this is European.)
 *F 27/4 *Cyrestis thyodamas thyodamas*, Bsd. Two males.
 (F 34/2 *Kallima inachus inachus*, Bsd.)
 F 35/2 *Precis oritya ocyale*, Hbn. One seen.
 F 35/3 ,, ,, *lemonias lemonias*, L. Fairly common.
 F 35/4 ,, ,, *almana almana*, L. Uncommon.
 F 35/6 ,, ,, *iphita iphita*, Cr. Common.
 F 36/1 *Vanessa cardui*, L. Uncommon.
 *F 36/3 ,, ,, *indica indica*, Herbst. Very common.
 F 36/4 ,, ,, *canace canace*, L. Rare. I also found a larva and pupa.
 *F 36/10 ,, ,, *cashmirensis aesis*, Fruh. Very common.
 The larvae swarmed on nettles round the Resthouse.
 F 38/1 *Symbrenthia hippoclus khasiana*, Mre. Very common.
 F 43/- *Issoria sinha sinha*, Koll. One female.
 F 45/2 *Cirrochroa aoris aoris*, Db. Fairly common.
 F 47/1 *Cethosia biblis tisamena*, Fruh. Two seen.
 F 49/2 *Ergolis merione assama*, Evans. One male.

Erycinidæ.

- *G 2/ *Zemeros flegyas indicus*, Fruh Common.
 *G 4/1 *Abisara fylla*, Db. Not common.
 G 4/5 ,, ,, *echerius suffusa*, Mre. Not uncommon.

Lycoænidae.

- (H 11/ *Castalius anaura*, DeN.)
 (H 21/2 *Lycanopsis puspa gisca*, Fruh.)
 H 21/20 ,, ,, *cardia dilicta*, Mre. Very common.
 H 24/6 *Zizeeria otis otis*, F. Common round the Resthouse.

- H 27/1 *Catachrysops strabo*, F. Not uncommon.
 H 28/ *Lampides batiscus*, L. Common.
 H 29/1 *Jamides bochus*, *bochus*, Cr. Not uncommon.
 *H 29/5 ,, *celeno*, *celeno* Cr. Common.
 (H 29/9 ,, *alecto euryaces*, Fruh. *elpis*, Godt.)
 H 35/2 *Heliophorus epicles indicus*, Fruh. Two females.
 (H 49/36 *Amblypodia centaurus pirithous*, Mre.)
 (H 49/41 ,, *bazalus*, Hew.)
 (H 49/79 ,, *areste areste*, Hew.)
 H 50/1 *Surendra quercetorum quercetorum*, Mre.
 Common.
 (H 57/1 *Spindasis vulcanus vulcanus*, F.)
 H 71/ *Tichera acte*, Mre. Not uncommon.
 H 85/12 *Rapala schistacea*, Mre. One male.

Hesperiidæ

- I 1/16 *Hasora alexis alexis*, F. One male.
 I 3/ *Bibasis sena sena*, Mre. Two males.
 I 4/4 *Choaspes benjaminii xanthropogon*, Koll. Two
 females.
 *I 11/16 *Celaenorrhinus leucocera leucocera*, Koll. Fairly
 common.
 I 14/ *Tagiades* sp. seen but not identified.

HETEROCERA.**Sphingidæ.**

- Acherontia* sp. A larva, presumably of *lachesis*, F.
 as it had violet oblique stripes.
 122 *Hippotion (Cherocampa) boerhaviae*, F. (*theylia*, L.)
 One male.

Syntomidæ.

- 402 *Ceryx (Syntomoides) godartii*, Bsd. Three males at
 light and two females at rest.
 455 *Eressa (Syntomis) confinia*, Wlk. *catoria*, Swinh.
 Two males at light.

Drepanidæ.

- 704 *Teldenia vestigiata*, Btlr. One female at rest.
 719 *Albara (Drepana) violacea*, Btlr. One female at rest.
 — „ *argenteiceps*, Warr. One female at rest.
 A female of an unidentified species.

Lasiocampidæ.

- 907 *Metanastris latipennis*, Wlk. Two males at light and a dead female on a path.
 936 *Trabala vishnu*, Lef. One full grown larva and several small ones.

Lymantriidæ

- 960 *Orgyia postica*, Wlk. Two males flying. Larvæ common on tea.
 1013 *Dasychira mendosa*, Hbn. One male bred from a cocoon.
 1046 *Dura (Imaus) alba*, Mre. One male at light.
 1101 *Porthesia (Euproctis) scintillans*, Wlk. *limbata*, Btlr, One female. Larvæ common on tea.
 (1111 *Leucoma submarginata*, Wlk.)
 1116 „ *fenestrata*, Hmpn. One male at rest. Although this species is described as being from Ceylon, my specimen agrees with the figure in 111. *Het. ix.*

Two unidentified species of *Leucoma*, One very like *submarginata*, Wlk. but bred from larvæ that do not agree with the description of larvæ of that species.

Arctiidæ.

- 1242 *Cretonotus (Phissama) transiens*, Wlk. One female at rest.
 *1266 *Nyetemera plagifera*, Wlk. Common flying and one female at light.

- (1247 *Nyctemera cenis*, Cr.)
 1279 *Utetheisa (Deiopia) pulchella*, L. One male flying.
 1395 *Narasodes punctana*, Wlk. One at rest and one at light.

An unidentified Lithosiid, very like *N. punctana*, Wlk. but grey instead of ochreous, and single specimens of three unidentified species of *Nola*.

Noctuidæ.

- 2307 *Cosmophila erosa*, Hbn. A male beaten out of undergrowth.
 2332 *Carea chlorostigma*, Hmpn. One female at rest.
 2401 *Patula (Nyctipao) macrops*, L. A male and female at rest.
 2501 *Ophiusa maturata*, Wlk. One male at light.
 2574 *Hemigia frugalis*, F. One female at light and one at rest.
 2926 *Hypena labatalis*, Wlk. A pair beaten from undergrowth.
 2936 „ *rectivittalis*, Mre. A pair beaten, one typical and one f. *speculalis*, Swinh.
 2971 *Hypena indicatalis*, Wlk. Beaten not uncommonly. An unidentified *Hypena* sp.

Geometridæ.

- 3090 *Thinopteryx crocoptera*, Koll. One female at rest.
 3163 *Prionia lithosiararia*, Wlk. Two males at rest.
 3357 *Buzura (Biston) suppressaria*, Guen. One female at rest.
 3541 *Pernicia ductaria*, Wlk. One male at light.
 3570 *Eumelea ludovicata*, Guen. One female at rest.
 3848 *Cambogia grataria*, Wlk. A pair beaten.
 3879 *Scopula (Craspedia) fibulata*, Guen. *effrenata*, Wlk. A male at rest.

- 3888 *Scopula (C.) remotata*, Guen. Common amongst
herbage.
- 3969 *Timandra amata*, L. *convectaria*, Wlk. (*amataria*,
L.) One male at rest.
- 4040 *Rhomborista (Chlorodontosera) megaspilaria*, Guen.
lyra, Swinh. (*pannosa*, Mre). One male at
light.
- 4059 *Hemithea tritonaria*, Wlk. One male flying.
Eight unidentified species of *Geometridae*.

Pyralidæ.

- 4776 *Pyncarmon caberalis*, Guen. f. *abdicalis*, Wlk.
common. One specimen of the typical form.
- 4825 *Syngamia floridalis*, Zell. One male flying.
- (5070 *Lepyrodes geometralis*, Guen.)

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Calcutta, 16-1-37.

Printed by Mr. J. N. GHOSH
at the Star Printing Works, 30, Shibnarain Das Lane, Calcutta.
and Published by
Mr. C. M. INGLIS, Natural History Museum,
DARJEELING.