THE

JOURNAL

OF THE

Natural History Society of Siam

March 1915. Vol. I. No. 3.

NOTES ON THE FAUNA AND FLORA OF RATBURI AND PETCHABURI DISTRICTS.

(Continued)

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Mountains Entirely Clad in Evergreen Forest.

Oates in his preface to "The Birds of British Burmah" speaks of the interior of Tennasserim bordering on Siam as being "almost impracticable to a European." The Petchaburi hinterland was, until four years ago, practically unknown both to Siamese and Europeans, being deservedly unpopular both on account of its inaccessibility and the deadly nature of the malaria only too easily contracted in the dark chasm-like valleys.

The boundary, or watershed is, however, probably more easily approached from the Tennasserim side than from the Siamese, owing to the fact of the Tennasserim river flowing due South parallel to the boundary for some 140 miles, and distant from it only some 7 to 15 miles. This river is, I believe, navigable by "dug outs" for the greater part of its length.

Expeditions in wild mountain country, practically uninhabited, are entirely dependent on coolie labour for the transport of goods and necessaries, and since a healthy Lao coolie consumes 35 to 40 lbs of rice per month (or the equivalent of one man's heavy load in such

country) it appears that trips of more than two weeks duration necessitate a considerable force engaged in bringing up supplies from a base.

As no description of this part of the country, so far as I am aware, has ever been given, it may be of interest if I shortly describe it.

The Petchaburi river, as it trickles beneath the bridge at the town of Petchaburi in the dry season, is an insignificant looking stream, and gives little indication of the fact that its course is upwards of 80 miles in length, draining an area of 1200 square miles, 600 of which are mountains of considerable elevation in the direct line of the S. W. monsoon.

The source of this river is in N. Lat. 12° 40,′ E. Long. 99° 20,′ this point being the birthplace of two other big streams:—the Huey Sat Yai (Big Beast river) which flows East into the Pran river, and the Cha-ra-wah flowing West into the Tennasserim river. From its source the Petchaburi river flows due North for 20 miles to the Elephant's Tusk rapid, where it is joined by the Menam Bang Kloi, which latter has its source some 17 miles to the N. W. The ground level at the junction is 145 metres above sea level and the boundary is distant westwards some 10 miles or four days' march.

The Elephant's Tusk is an impassable rapid for dug outs,—the banks being precipitous there is no opportunity, as at other bad rapids, of dragging the canoes through overgrown shallows at the sides of the main stream.

From this point the river flows some 18 miles due East when the first Kariang hamlet is reached, viz:—Ta Ling Lom (Wind monkey landing) and a further 12 miles E. S. E. carries one to Sarahett. Here the river makes a sharp bend and flows due N. E. to Petchaburi town.

The northern portion of this area is drained by the Meh Pachee river which rises with the Bang Kloi in N. Lat. 13° 10′ and flows due North some 50 miles where it joins the Quaa Noi.

The area to the south of the Petchaburi watershed is drained by the Pran river, the source of which lies some 10 miles N. E. of the source of the Petchaburi river and about 10 miles on the Eastern or Siamese side of the boundary range.

All these three rivers for the first 20 miles of their courses lie in deep gorges, together with their hundreds of tributaries. Only occasionally dosmall flats occur in the bottoms, and these are seldom of any extent. The greatest altitude found was 1505 metres (5000 ft.)

on the boundary in N. Lat 12° 54′, and as a rule in that district the boundary is over 1100 metres in height, rarely falling below 800 metres. There is an entire absence of plateau-like or undulating ground, the mountains being steep sided, and the ridges or summits, seldom more than 10 to 30 metres in breadth, falling away on either side to the valleys at slopes varying from 25 to 60 degrees. Generally speaking the summits of ranges or ridges are from 300 to 500 metres higher than the valleys directly beneath them.

There is, thus, very little deep humus or water holding soil, the greater part of the rainfall finding its way immediately to the rivers, and accounting for the sudden floods to which these streams are subject, it being no uncommon occurence for the Petchaburi river in the rainy season to rise 20 feet in 12 hours, and 30 feet has been known in the same period. The formation is granite with a few small and isolated limestone outcrops.

With the exception of *H. odorata*, which is mainly confined to the banks of running streams, and a species of *Salix* growing both on the banks and in the shallows, the jungle is very varied, but the greater portion is dark and gloomy—the undergrowth varying in intensity according as the overhead foliage is light or heavy. Once off the main game tracks it is usually necessary to cut one's way when ascending to mountain tops for work. As previously stated, the ridges slope away sharply on either side of the crest, but no view is obtainable until extensive clearing has been done. In the same way in the valleys, if one required sunlight in camp to dry clothes or dry up the land leeches, it was always necessary to spend some hours felling the timber and jungle, and then frequently, owing to the depth of the ravine, it was only possible to obtain 3 or 4 hours sunshine.

The Karangs make a few paths in the vicinity of their houses and clearings, but otherwise the only paths available are those made by the wild elephants. These cross and recross the streams every 50 or 100 yards but are otherwise frequently quite good. A few main tracks were found leading over the less steep ranges—paths used by the elephants during the rains when in search of bamboo shoots, and leading over dividing ranges from one valley to another.

I propose to describe a couple of trips in that country which will indicate its nature away from the main stream.

On the 15th March 1912 I left my headquarters camp with 20 coolies and, crossing a low ridge, slept that night at a big rock pool in the Huey Ma Rew, a favourite haunt of langurs, and attracted by the excrement of these, or some other cause, numberless flies kept up a humming as of swarms of bees till nightfall and started again at dawn. In the previous year a herd of sladang haunted this pool for some months : and on one occasion while we were improving the game track to make it serviceable for mail transport, a sladang waited at the side of the path watching me till I approached within 10 yards. The first intimation I had of its presence was when, whirling round, it dashed up the hillside. At other times I have found them lying down during the heat of the day on the more open knolls of a hillside, and on such occasions they go crashing down to the valleys before one gets near them ; and the fact of this beast waiting is probably attributable to the haphazard and "doing nothing in particular" manner of my approach.

Following the stream to its source, the path ascends steeply and crosses the rather flat watershed between the Ma Rew and Maa La Liang valleys at an elevation of some 450 metres. I found the bed of a small dry stream crossing the path to be much encrusted with a deposit of lime several inches in thickness, and more especially of course where the water had trickled down small declivities. In the previous year I saw on this path a large family of the big muscular Stump-tailed Macacques—never found outside the evergreen jungle and usually at some elevation. In 1911 I obtained a young one dropped by his mother in her flight, and this I kept till it died of sun-stroke during the present year.

Continuing along the well defined game track, the path descends at an easy slope to the Huey Maa La Liang. This stream has its source at the base of a mountain range surmounted by a grass covered peak some 1250 metres in height, and is the only mountain within a radius of ten miles with a name to it (Kao Pa Nern Toong). In the previous year the valley was inhabited by a Karang and his family, but in April the wife and daughter fell ill with cholera, and the husband fled leaving them to die and their bodies to dry in the sun. In cases of cholera and small pox, Kariangs and Karangs immediately flee, forming new settlements elsewhere, but I believe as a rule bury their dead. In 1912, small pox broke out in my headquarters camp, and

some few Kariangs did temporarily quit their homes near by, but a Government official arriving, tied new 5 cent pieces round the necks of all and sundry and so averted disaster.

Following the game track, we were attracted by the smell of some dead beast, and found, some 10 yards from the path, a black leopard lying flat on its back with its neck or its back apparently broken. The ground at that point was flat and covered with very tall trees, the nearest branches being not less than 80 feet from the ground. It appeared to me that the leopard had been chasing langurs in the branches overhead and, missing its footing, fell from a great height and was killed. There was no wound on the body apparently, though I did not long pursue investigations on account of the stench,

Though shut in by mountains on all sides this valley is more open than most, and contains a good deal of secondary growth.

The Grey Peacock-pheasant (*Polyplectron thibetanum*) was exceptionally common, and the call when heard from a great height above the valley resembles that of a hoarse goat. Near at hand it is "qua-qua-qua," repeated with lessening intervals until the bird apparently becomes apoplectic and can only screech. I have been told by trustworthy men that the Peacock-pheasant is the "kaw kaw" bird, and that on a sudden clap of thunder a captive bird was actually seen uttering this sound. On the crash caused by falling trees or on a clap of thunder, this "kaw kaw" is instantly heard, together with the barking of any langurs within hearing, and I have only heard this "kaw kaw" in jungle inhabited by the Peacock-pheasant. In the higher and darker portions of this valley I first saw the Pittas, and also an Orange-headed Ground-Thrush, snared by the feet. Wood Partridges also were common and were snared by the coolies, who imitate the call with a reed.

At this point I turned South, ascended to about 600 metres and dropped down into the head waters of the Pran river, and following down this, arrived at a Karang settlement of four houses. Here I obtained the Bronze-winged Dove (*Chalcophaps indica*) which is by no means common in Petchaburi though generally distributed, and I have only met them singly, never in small flocks as, according to Oates, they are found in Burmah.

I obtained also the White-breasted Water-hen. The only mammal shot was the big black squirrel (*Ratufa melanopepla*), much more

sluggish than the common squirrel, and which has the habit of lying spread flat on big horizontal branches for some time when observed, with perhaps the end of the tail appearing over the side only.

From here I followed down the Pran valley to the next Karang hamlet, and ascending a range of 600 metres to the South East, crossed over into the Huey Sat Yai, a stream considerably bigger than the parent Pran river.

On the march we found old evidences of rhinoceros, and the cook collected all the dried excrement he could find, the Chinese having great faith in anything connected with the rhinoceros as medicine.

The game track up the Sat Yai is excellent going in the dry season, and the track must have been used without change for generations by pachyderms, judging by the gnarled tree roots and rocks polished and worn smooth occurring in the path. On the 2nd day's journey up this stream, at about nine o'clock, we found ourselves on the brink of a dry gully, which extended in an almost straight line far up the hill side, and showed up clearly against the deep green jungle on either side. A pair of Malay bears were observed feeding and leisurely turning over stones up the gully some 200 yards away. These I stalked and missed, but I came back at 6 p.m. when another bear appeared in the same spot, and this I also missed, misjudging the distance in the failing light. The Malay bear was frequently observed in that valley and took little heed of the coolies going to and fro for rice and supplies.

Two days later, continuing the march upstream, the fresh tracks of rhinoceros were found. I have not yet seen one, but from the fact of native hunters recognizing the "raadt" or one-horned species and the "kra-soo" with two horns, it is almost certain that both *R. sondaicus* and *R. sumatrensis* exist in that area. I have found their tracks up to and above 4000 feet. In 1911, a female with young attacked a Survey party in the Yang Choom valley, and savagely bit a coolie in the arm.

It was found necessary to camp on a ridge of some 1200 metres on the boundary, water being brought up daily by the coolies from the valley 700 metres below. The trees at that elevation are entirely clothed with mosses, tree ferns and orchids, and many of the outer trees are stunted, there being no high ranges on the Tenasserim side at that point to lessen the force of the S. W. monsoon.

The Grey-headed Imperial Pigeon (*Carpophaga griseicapilla*) was obtained here. The call is a peculiarly deep "er-woob-woom" and I have

only heard it at elevations of 1000 metres or more. A Davison's Barbet (*Cyanops davisoni*) was obtained with three young, in a hole at the top of a dead stump. All the barbets are bad sleepers, and throughout the night in jungle country, whether camping in valley or mountain top, one hears their monotonous call.

At this high elevation a brilliantly coloured snake was found, possibly *Doliophis bivirgatus.* The snake, some 4 feet long, was azure-blue covered with small white spots, the whole head and last 6 inches of the tail being a brilliant red, glistening as though painted with enamel. In July my coolies met and described to me a similar snake, found at some 800 metres elevation.

Working on this 1200 metre ridge, two species of Horse Fly (*Tabanus rubidus* and *T. striatus)* were very troublesome, in addition to hundreds and thousands of thirsty bees of five different sizes which, during the hot season, are always attracted to freshly felled spots, and hinder one's work by entering eyes, ears, and nose, swarming on the hands and exploring up one's sleeves in their search for moisture. Frequently they become so bad as to necessitate smoke fires. Fortunately only two of the larger species of bee sting. The largest, with a buff band round the body, constructs big half-circular nests beneath the horizontal limbs of a smooth backed species of *Ficus,* or beneath an overhanging rock on a cliff face. This species is widely distributed and I saw a nest in course of making beneath an arch at the Colombo Museum.

While on the subject of thirsty insects, it may be of interest to mention that certain Skipper and Fritillary butterflies have the power of exuding drops of water to moisten surfaces on which they wish to feed, and I think this must be a peculiarity of tropical butterflies, as I certainly never noticed or heard of it in Europe. On one occasion a Skipper exuded five drops of water within the space of two minutes on the back of my hand, dabbling his trunk in the drop between his hind legs until finished, when he repeated the process. The drops were of large size and the five together would apparently equal the bulk of the insect's body. I have seen them do the same thing on a chair or table in camp.

When ascending to this camp on the 28th March, we experienced torrential rain, and on the 31st the camp was enveloped in cloud. Descending on the 1st April, we found the rains and floods had brought

out the land leeches, and the coolies, who are as a rule rather leisurely on the march, fairly raced through the valleys, halting only on rocks in mid-stream to pull or scrape the leeches off. Later in the season the coolies became more expert, and on the march carried a stick apiece, to the end of which they tied on a tiny bag containing tobacco, pounded chilies, and red lime. This dabbed on a leech had the effect of instantly shrivelling it up. From observation I think these worms are very sensitive to, and hunt or are attracted by, vibration, making no use of their rudimentary eye spots. Keeping quite still, and with ten or more leeches in sight standing erect, slowly waving their heads about, I stamped my foot, when they would all advance towards me, but would then stop in doubt, unless the stamp were repeated. The young appear in May or June and are a great nuisance in July, being then only the size of needles, and can get through lace holes in boots and crevices in putties with ease.

The camp in the valley was some 400 metres above sea level, shut in on all sides by mountains of 1200 to 1300 metres elevation, and two hours after arrival in camp the Huey Sat Yai rose some five feet and became quite impassable. I obtained here a Rail which I believe to be *Rallina superciliaris*, and which seemed to me quite out of place in dense forest, nor have I met the bird elsewhere.

On the return journey heavy rain fell on the 4th April. On the 5th my dogs picked up the scent of a tiger off the shrubs and bushes bordering on the path, and, as the scent got hotter, off the path itself; this was 9 a.m. and it became apparent that the tiger was going down for a morning drink at a rock pool just ahead. I crawled round the last bend hoping to see the beast drinking, but found two Karangs having breakfast there, and they informed me that on sight of them the beast had bolted up the hillside. Tigers have recently been giving some trouble in the coast districts of Ratburi, but I do not know of any authentic case of molestation by tigers among the hundreds of coolies who have been employed by the Survey Department in the wild parts of Ratburi. They have taken an inquisitive interest in our doings and eaten our transport mules; and on one occasion a tiger walked all round and between a party of four coolies sleeping out on a sand bank, but they knew nothing of its presence till morning.

On the 15th April I left headquarters camp for a trip to the head waters of the Bang Kloi river, and on the 3rd day out arrived

at a surveyor's camp situated in a deep gorge at the head of the Hue Maa Pradohn. The surveyor had a live larder containing peacock-pheasants and hill partridges. He had also the skin of a very rare cat, *Prionodon maculosus* (the Burmese Linsang), which had been trapped after several raids on the penned birds. The skin was subsequently lost in the floods. The following night I slept at a Trig. station above the camp, elevation 1150 metres. Heavy rain fell that night, and the following morning the view was exquisite—the whole valley of the Bang Kloi being a sea of white cloud with the higher ridges and peaks showing up as dark green islands. To the East the Gulf of Siam was just visible. Descending Westwards from here was very bad going, and a couple of days were spent in searching the numerous ravines for anything like a human track leading up to the "House at the Heart of the World" (*Ban Chai Paan Din*). We arrived there on the 24th April, very curious to see this solitary Karang household and eager to buy rice, of which the Trig. party had reported there was a large supply. The husband was away, and neither the wife nor a dirty youth (alleged to be an 'angel' with a knowledge of all languages) could speak Siamese. The place certainly surprised me, being situated on a slight spur jutting out from a small flat-topped range of some 800 metres elevation. On a cleared space was a "bawt" or temple, and near it a small "wihan," together with a couple of buildings not usually found in Buddhist places of worship, viz:—to the North of the "bawt" a small rectangular building for the male "chao" or spirit and to the South, one for the female—the latter being some 8 feet square and perched on the top of a 6 feet pole, access being had by a ladder. Around these buildings the ground was perfectly cleared of weeds, and flowering trees and shrubs had been planted and clipped for ornament. From this point a splendid view of the mountain ranges to the East was obtained. The following day the owner, Palloogaw, returned, a tall Karang with a heavy moustache. He could speak a little Siamese, and sold me a quantity of rice and chickens—the only Karang in the whole of Petchaburi who had rice for sale. On my asking him how he had found this spot for his abode, Palloogaw replied that the "chao" had told him of the spot in a dream; but I afterwards found out that he himself was reared at Lum Sai on the Quaa Noi River, and had lived here with his wife for the past 22 years, her parents having migrated from Tennasserim, the boundary being only two miles distant. The

man was apparently his own head priest, and on moolight nights entered his temple and slowly beat a small drum. My coolies were afraid to trespass near the temple, and when my assistant asked permission to worship there, the old man said he must first anoint him.

The household was unusually large, the parents and eleven children, all alive and sturdy, owing their health presumably to the high elevation, and having been settled there for many years past, the primeval forest had been felled each year in small patches for some distance around. Karang families as a rule are very small, one man this year telling me that his wife had had twenty children, of whom three survived, and they are, too, very improvident, seldom having sufficient rice to last for the whole year. In 1912, the Karangs at the head waters of the Petchaburi, were living on a species of a big potato in July, and would have to subsist on roots and tubers until the rice crop matured in December. Being laid up here for a week with a poisoned foot, I was able to study the "angel" previously referred to. He appeared to be a youth more weakly and therefore more indulged than the others, and could speak neither Siamese nor Burmese, though he was an excellent shot with a cross bow.

Travelling North and crossing the head waters of the Bang Kloi, we crossed the watershed at 1000 metres elevation and followed down the Meh Pachee river, and on the second day arrived at the Karang hamlet nearest to "Chai Paan Din," arriving at Sooan Peung on the 3rd day. Here mules were obtained, and when nearing Ratburi on the 6th May a heavy storm burst, lightning striking the parched fields and raising huge clouds of dust. Hail falling in large lumps whitened the ground, and within half an hour the paddy fields were flooded.

I was laid up in Bangkok some three weeks, but left again at the end of May with 74 Lao coolies and 10 Chinese. Of these latter, four succumbed to malaria and privation—the Chinese appearing to be useless for any kind of pioneer work. Arriving at headquarters camp, I found a number of men down with malaria, so on 9th June started off to complete the Topo. detail survey on the boundary. The water had risen considerably but the dug outs all reached the rice depot at the Elephant's Tusk rapid without mishap on the 12th June.

On the way up we met the Kariang head man from Tah Ling Lom with five others, returning from a fruitless search for Ban Chai

Paan Din, he having received orders to bring in the reported "angel."

With the water rising steadily, the old route for supplies along the bed of the Petchaburi river became impossible, and a new route had to be cut over the mountains. In three days we progressed two miles and regained the East bank of the Petchaburi river again. I ascended two hills here to get the lie of the country and find a possible route to the boundary, and while camped here an emaciated party rafted down in search of food.

We endeavoured to bridge the flooded river by felling trees, but finally had to cross on a pontoon raft of bamboos, hauling it to and fro with giant rattans. Even thus it was a perilous journey, and all valuables had bamboo floats tied to them before being put aboard.

Arrived at the far bank, further path cutting was necessary, and while we were doing this a pair of porcupines ran out of their burrow and, gazing for a second, ran off. The burrow was situated some 100 metres up the hillside, and later on, endeavouring to smoke them out, the half-gnawed lower jaw of a pig was discovered in the burrow. No records were kept of porcupines obtained, but I presume they are of the same species as those obtained at Hua Hin, viz, *Hystrix grotei*.

Crossing a ridge, we descended into a tributary stream flowing from the West, and ascending this for a day's march, made camp at a spot showing fresh tracks of tapir, and the bed place of one of them was found some 150 metres up the hillside. Tapirs appear to have the habit, in common with the great cats, of scratching up the ground with the hind feet, and frequently deposit their excrement at the bases of trees. They are never, I believe, intentionally shot by jungle folk, who look upon these rather defenceless creatures as peculiar. They allege that the Creator, having devised all other beasts to his entire satisfaction, had left over numerous remnants of clay. Taking these in his hands, he rolled them all up together, exclaiming "p'som-sett".* Hence the tapir, with four toes in front, and three on the hind feet as in the rhinoceros, and in other parts superficially resembling some other animals.

On the return of the coolies sent back to the depot for rice, camp was again shifted up on to a ridge of 900 metres elevation.

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* Literally, "the mixing is finished."

Being July, the S. W. Monsoon was at its height and my work was greatly hindered by mist. Heavy rain fell daily, but fortunately the leaves of a broad-leaved palm were available for roofing.

At this time, of my 32 coolies, only 10 were available for work, 12 went to and fro to the "Elephant's Tusk" depot for rice, and one-third were always down with malaria. Of the gang sent back for rice, three men preferred the excitement of rafting down the rapids (on a few bamboo poles strung together) to the drudgery of scrambling along the cut path on the banks, and in consequence were laid up for several weeks with bad wounds. Added to the climatic discomforts was the fact that we were constantly short of rice, owing to the ferry raft breaking away on one trip, when a considerable amount of rice was lost.

On this ridge I met a species of black langur (*Presbytis femoralis*) not previously observed elsewhere.

This species is less robust in form than the other species inhabiting Petchaburi, viz. *P. obscurus*, and was not observed at elevations below 800 metres. The fur is woollier than in other species, and the young appear to be black or dark-coloured in early life. The call, which may be rendered "oo-oo-terruk", is entirely different from that of *P. obscurus* or *germaini*, and it lacks the hoarse bark of these two species. The Northern limit of *P. femoralis* appears to be N. Lat 13° 50′, where the boundary range drops to 350 metres elevation and is crossed by a belt of deciduous dry jungle, which would appear to be unsuitable for the species. From here it ranges down to Singapore, though the Malayan type has considerably more white on the belly and underparts than any specimens obtained by me.

The White-handed Gibbon (*Hylobates lar*) was also obtained here, and was found to have a good deal of fat on the shoulders and back, possibly affording it some protection against the awful weather. The hill men (*Karangs*) have also observed that the gibbon is very fat during the rains. The species is most variable, ranging from a dirty straw colour to black, but the hair on hands and feet is invariably white, as also is a ring round the face.

On this ridge was found a very big herd of Stump-tailed Macacques (probably *M. rufescens*), and hearing them before seeing them I thought the sound was that of a pack of wild dogs quarrelling over a carcase. The adults galloped off leaving the youngsters to make their way to the tree tops. Following the game track on top of the

ridge, a solitary boar was bagged, not apparently in the least perturbed by the explosion of the gun in shooting a hornbill only 70 yards away. A flying lemur (*Galeopithecus volans*) was observed clinging to the side of a tree, hanging at the full extent of its fore legs with the tail tucked away out of sight, and certainly not head downwards as reported by Blanford. This specimen was a beautiful soft grey in colour, and when disturbed the parachute was seen to be a dark brown. It floated away to the base of a tree, and flopped up the trunk in a most ungainly way. When hanging on the trunk of a tree it has the appearance of a pear-shaped excrescence, and finding itself observed would imperceptibly sidle round the trunk. At 900 metres a monitor (*Varanus nebulosus*) was shot while eating a lizard of the genus *Calotes*, and afforded a pleasant change in a daily diet of dried pig, the flesh having the appearance of fish and a taste resembling chicken.

Work on this ridge being completed, on the 18th July camp was shifted down to the stream, the sick men being pushed and rolled down, and the treatment apparently did them good for none died. Making these men as comfortable as possible and putting the convalescents in charge, the following day I climbed a ridge of 1,000 metres to the North, taking with me 4 days rice, and water for one night. The first day on the ridge was fine and a considerable amount of work was completed, but on the following day, shifting camp again northwards along the ridge, the clouds never lifted for more than three or four minutes at a time, several hours being wasted searching for a Trig. point near which I wished to camp. During the search, an immense solitary boar was shot, standing 33 inches at the shoulder. This beast was very fat and estimated to weigh about 300 lbs. Only one testicle had dropped. The tusks were fair, being about 9 inches in length.

This ridge was broader than usual, and running water was obtained only 50 metres below the summit. During the next twelve days the climatic conditions were not pleasant. The mountains on the Tennasserim side, to the West, being of low elevation, the full force of the monsoon whistled through the trees, driving clouds and mist through the camp, and the tree tops were usually invisible. Mosses and orchis flourished on the firewood, and did not wither till actually licked by the flames. Land leeches paraded about the kitchen, and a small blood-sucking fly left peculiar blood spots beneath the skin on exposed parts of the body. The fly attacked the bare legs of the coolies,

and on scratching, mud or dirt penetrated, poisoning the blood and incapacitating them.

On the day of arrival we found the fresh tracks of elephant, rhinoceros and tapir ; but it was surprising to find the black langur (*P. femoralis*) staying on the exposed ridges during such weather, when even the gibbons were silenced, and also numerous small passerine birds including flower-peckers, fantail-flycatchers and babblers. A big flock of hill partridges haunted the camp, and on the 2nd August a green jay (*Cissa chinensis*) was obtained, one of a party of five. On one occasion when going to the Trig. station, for the daily dreary wait for a break in the clouds, a large herd of pig were observed feeding within 20 yards of the ridge summit, all unconscious of our presence ; and so they remained, for the guns had been sent in another direction to secure langur meat.

It may be of interest to mention that wild pigs make nests, and when first I struck one of these I took it to be the nest of some archaic bird, but the coolies recognised it immediately as a pig's nest. Several have been observed, entirely composed of sticks ranging from the size of a finger to an inch in diameter, all having been bitten off from the jungle around the nest. The pile is rather less than 3 metres broad by 1 high, and the pig tunnels beneath the pile. Blanford mentions that in India pigs make nests of grass, but in the evergreen jungle there is little or no grass.

During this year I came across another nest or shelter which puzzled me considerably. At an elevation of 850 metres on the boundary, I found a rough shelter formed of leafy branches, thick end uppermost and supported by a thin clump of small bamboos. The branches appeared to have been arranged methodically, and looking for the mark of a knife, I found that the branches had been bitten and torn off from the tree overhead, which was stripped of its smaller branches, some of which had not fallen to the ground but lay withered in the forks above. A bear's claw marks were visible on the tree, so it is a point for investigation as to whether bears form some sort of shelter during the rains.

On the 13th day of our sojourn in this inhospitable region the clouds lifted for short periods, and on the 4th August the sun broke through for 3 hours, enabling me to complete the work on the boundary. The following day the return journey was commenced in the

pouring rain, the descent to the valley not being easy on the slippery clay, and the flooded stream down which our path lay was barely negotiable. On arrival at the big river, one of a very noisy flock of Tickell's Hornbill (*Anorrhinus Tickelli*) was obtained, the species apparently having a much wider range than supposed by Oates, who records this bird only from one valley near Moulmein, about 200 miles to the North of this point.

On arrival at Elephant's Tusk depot, I was relieved to find that all other parties had completed and returned to headquarters camp some time previously. The canoe men on rice transport told me that 50 °/₀ of the bamboo rafts starting from Elephan'ts Tusk had smashed up in the rapids, and I therefore decided to cut my way out, using the canoes for the sick. The canoe men picked up four starving and raft-wrecked Chinese coolies on the way down, two of whom died after arrival at headquarters camp.

Of the 400 men engaged on the work in the Petchaburi hinterland, 7 °/₀ died of malaria in the district, and 3 °/₀ from other causes, cholera, small pox, suicide and drowning; and looking back on the awful difficulties experienced in that country during the monsoon, I am surprised that the percentage was not greater. Of my own coolies none died of malaria, and this I attribute to their having plenty of pig and monkey meat when the rice failed, and to a daily dose of 5 grains of quinine.

LIST OF MAMMALS, BIRDS, REPTILES AND BATRACHIANS OBTAINED IN THE RATBURI AND PETCHABURI DISTRICTS.

The nomenclature as in *Fauna of British India* has been followed except in such cases where the British Museum or other authority has reverted to an earlier name or split up species. In such cases the newer name is used, those in the *Fauna* beiug given in brackets.

Species identified by the authorities of the British Museum are shown in heavy type, thus :—**Hylobates lar.**

Species of which no specimens have been retained or which were only observed are marked with an asterisk.

MAMMALS.

ORDER PRIMATES.

Hylobates lar. *The White-handed Gibbon.*

MACACUS ARCTOIDES. *The Brown Stump-tailed Macacque.*

M. RUFESCENS. *The Rufous Stump-tailed Macacque.*

Of Nos. 2 and 3 no adult specimens have yet been obtained, and it is impossible to tell whether the young are *arctoides* or *rufescens*. The young of the species obtained by me (I believe *rufescens*) has a very fetid scent, whereas adult captive specimens of what I think are *arctoides* from N. Lat. 10° have no scent.

M. NEMESTRINUS. *The Pig-tailed Macacque.*

M. CYNOMOLOGUS. *The Crab-eating Macacque.*

Presbytis Barbei. *Barbe's Langur.*

P. obscurus. *The Dusky Langur.*

P. Germaini. *Germain's Langur.*

P. femoralis. *The Banded Langur.*

Presbytis is the *Semnopithecus* of Blanford. *P. Germaini* occurs only as an isolated colony west of Ratburi and separates *obscurus* to the South from *Barbei* to the North.

NYCTICEBUS TARDIGRADUS. * *The Slow Loris.*

ORDER CARNIVORA.

FELIS TIGRIS. * *The Tiger.*
F. PARDUS. * *The Leopard or Panther.*
F. TEMMINCKI. * *The Golden Cat.*
F. VIVERRINA. * *The Fisking Cat.*
F. bengalensis. *The Leopard Cat.*
F. chaus. *The Jungle Cat.*
Viverra zibetha. *The Large Indian Civet.*
PRIONADON MACULOSUS. * *The Burmese Tiger-Civet.*
Paradoxurus hermaphroditus, *The Malayan Palm-Civet.*
Canis aureus. *The Jackal.*
Cyon rutilans. *The Malay Wild Dog.*
URSUS TORQUATUS. * *The Himalayan Black Bear.*
URSUS MALAYANUS. *The Malay or Honey Bear.*

ORDER INSECTIVORA.

TUPAIA FERRUGINEA. *The Malay Tree Shrew.*
Galeopterus (GALEOPITHECUS) **volans.** *The Flying Lemur.*

ORDER CHIROPTERA.

PTEROPUS SP. * (probably EDULIS. *The Flying Fox*).
RHINOLOPHUS LUCTUS. *The Great Eastern Horse-shoe Bat.*

ORDER RODENTIA.

Ratufa melanopepla (SC. BICOLOR). *The Large Malay Squirrel.*
Sciurus caniceps. *The Golden-backed Squirrel.*
S. atrodorsalis. *The Black-backed Squirrel.*
S. epomophorus.
S. MACCLELLANDI BARBEI. *The Striped Himalayan Squirrel.*
Hapalomys longicaudatus. *Berdmore's Rat.*
RHIZOMYS SUMATRENSIS. *The Large Bamboo Rat.*
RHIZOMYS SP. * (probably BADIUS. *The Bay Bamboo Rat*).
Hystrix grotei. *The Malay Porcupine.*
LEPUS SIAMENSIS (PEGUENSIS.) *The Siamese Hare.*

ORDER UNGULATA.

ELEPHAS MAXIMUS. * *The Indian Elephant.*
RHINOCEROS SONDAICUS. * *The Small One-horned Rhinoceros.*

RHINOCEROS SUMATRENSIS. * *The Asiatic Two-horned Rhinoceros.*
TAPIRUS INDICUS. * *The Malay Tapir.*
BOS GAURUS. * *The Gaur or Indian Bison.*
B. SONDAICUS. * *The Banting.*
CAPRICORNIS (NEMORHAEDUS) SUMATRENSIS MILNE-EDWARDSI. *The Goat Antelope.*
CERVULUS MUNTJAC CURVOSTYLIS. *The Barking Deer.*
CERVULUS FEAE. *The Black Barking Deer.*
CERVUS UNICOLOR EQUINUS. *The Malay Sambar.*
TRAGULUS SP. * (probably JAVANICUS. *The Mouse Deer*).
SUS CRISTATUS. *The Indian Wild Pig.*

EDENTATA.

MANIS SP. * (probably JAVANICA. *The Malay Pangolin*).

BIRDS.

I regret that this list is in no way representative of the avifauna of the Petchaburi—Ratburi district, but my collecting has been done with a 12 bore gun, which is not suitable for small Passerine birds. Other classes I have inexcusably neglected—noticeably the Woodpeckers which abound in this area.

The numbers are those of the *Fauna of British India—Birds.*

ORDER PASSERES.

4. CORVUS MACRORHYNCHUS. The Jungle-Crow.
14. CISSA CHINENSIS. The Green Magpie.
64. DRYONASTES CHINENSIS. The Black-throated Laughing-Thrush.
71. GARRULAX DIARDI. The Siamese White-crested Laughing-Thrush.
118. POMATORHINUS OLIVACEUS. The Tenasserim Scimitar Babbler.
176. MIXORNIS RUBRICAPILLUS. The Yellow-breasted Babbler.
250. CHLOROPSIS CHLOROCEPHALA. The Burmese Chloropsis.
255. MELANOCHLORA SULTANEA. The Sultan-bird.
290. OTOCOMPSA FLAVIVENTRIS. The Black-crested Yellow Bulbul.
299. PYCNONOTUS FINLAYSONI. Finlayson's Stripe-throated Bulbul.
327. DICRURUS ATER. The Black Drongo.
340. DISSEMURUS PARADISEUS. The Larger Racket-tailed Drongo.

475. Lanius nigriceps. The Black-headed Shrike.
491. Pericrocotus fraterculus. The Burmese Scarlet Minivet.
512. Artamus fuscus. The Ashy Swallow-Shrike.
514. Oriolus indicus. The Black-naped Oriole.
521. Oriolus melanocephalus. The Indian Black-headed Oriole.
524. Eulabes intermedia. The Indian Grackle.
536. Sturnia sinensis. The Chinese Myna.
546. Graculipica nigricollis. The Black-necked Myna.
549. Acridotheres tristis. The Common Myna.
553. Aethiopsar grandis. The Siamese Myna.
556. Sturnopastor superciliaris. The Burmese Pied Myna.
575. Cyornis rubeculoides. The Blue-throated Flycatcher.
599. Tersiphone affinis. The Burmese Paradise Flycatcher.
601. Hypothymis azurea. The Indian Black-naped Flycatcher.
606. Rhipidura javanica. The Java Fantail Flycatcher.
663. Copsychus saularis. The Magpie-Robin.
664. **Cittocincla macrura**. The Shama.
686. Geocichla citrina. The Orange-headed Ground-Thrush.
721. Ploceus megarhynchus. The Eastern Baya.
801. Emberiza rutila. The Chestnut Bunting.
841. Anthus maculalus. The Indian Tree-Pipit.
884. Aethopyga cara. The Tenasserim Yellow-backed Sun-bird.
912. Dicaeum cruentatum. The Scarlet-backed Flower-pecker.
930. Pitta cyanea. The Blue Pitta.
931. Pitta cyanoptera. The Lesser Blue-winged Pitta.
935. **Pitta cucullata**. The Green-breasted Pitta.

ORDER EURYLAEMI.

939. Corydon sumatranus. The Dusky Broadbill.
940. Cymborhynchus macrorhynchus. The Black-and-red Broadbill.

ORDER PICI.

984. **Micropternus brachyurus.** The Malay Rutous Woodpecker.

ORDER ZYGODACTYLI.

1009. Thereiceryx lineatus. The Lineated Barbet.
1013. Cyanops Davisoni. Davison's Blue-throated Barbet.
1019. Xantholaema haematocephala. The Crimson-breasted Barbet.

ORDER ANISODACTYLI.

1023. Coracias affinis. The Burmese Roller.
1027. Merops philippinus. The Blue-tailed Bee-eater.
1032. Nyctiornis amictus. The Red-beaded Bee-eater.
1033. Ceryle varia. The Indian Pied Kingfisher.
1035. Alcedo sp. * (probably ispida. The Common Kingfisher).
1043. Pelargopsis gurial. The Brown-headed Stork-billed Kingfisher.
1050. Carcineutes pulchellus. The Banded Kingfisher.
1051. Dichoceros bicornis. The Great Hornbill.
1053. Anthracoceros albirostris. The Indo-Burmese Pied Hornbill.
1055. **Rhytidoceros subruficollis.** Blyth's Wreathed Hornbill.
1059. Ptilolaemus Tickelli. Tickell's Hornbill.
1067. Upupa indica. The Indian Hoopoe.

ORDER MACROCHIRES.

1091. Caprimulgus asiaticus. The Common Indian Nightjar.
1096. Lyncornis cerviniceps. The Great Eared Nightjar.
1098. **Batrachostomus affinis.** Blyth's Frogmouth.

ORDER TROGONES.

1103. Harpactes orescius. The Yellow-breasted Trogon.
1120. Eudynamis honorata. The Indian Koel.
1130. Centropus sinensis. The Common Coucal or Crow-Pheasant
1133. Centropus bengalensis. The Lesser Coucal.

ORDER PSITTACI.

1140. Palaeornis rosa. The Eastern Blossom-headed Paroquet.
1145. Palaeornis fasciatus. The Red-breasted Paroquet.

ORDER STRIGES.

1152. Strix flammea. The Barn-Owl or Screech-Owl.
1170. Huhua nepalensis. * The Forest Eagle-Owl.
1178. Scops bakkamoena. The Collared Scops Owl.
1183. Glaucidium cuculoides. The Large Barred Owlet.
1187. Ninox scutulata. The Brown Hawk-Owl.

ORDER ACCIPITRES.

1189. Pandion haliaëtus. The Osprey.