

in the interests of economy the Treasury were unable to provide the necessary funds for publishing the various lists of names, and though this Society has contributed as much as we can afford we have been obliged to make appeal to every kind of society and institution for aid to carry on a work which will do so much to aid in the proper pronunciation and transliteration of names of places and geographical features in foreign countries and prevent confusion in identifying them.

During the present Session we tried the experiment of holding informal receptions in the evenings at the Society's house. But, except on one or two occasions when something of special interest was on exhibition, they were not well attended, and it will probably be well in future only to hold them for some special purpose.

As this is my last Presidential Address, I take the opportunity to acknowledge my indebtedness to Mr. Hinks. He devotes his abilities and energies whole-heartedly to the affairs of the Society, and conducts them with thoroughness and competency. The preparations for the Mount Everest Expedition added greatly to his labours, but the efficiency with which it was organized was largely due to Mr. Hinks.

In closing my address I would once again thank the Society for the honour which you did me in electing me your President, and I would express the hope that I have carried out my duties to your satisfaction.

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## THE NATURAL HISTORY OF SOUTH-WESTERN TIBET

A. F. R. Wollaston

*Read at the Meeting of the Society, 20 February 1922.*

TO a naturalist Tibet offers considerable difficulties; it is true that in many places animals are so tame that they will almost eat out of your hand. In the Rongbuk valley the burrhel come to the cells of the hermits for food, and in every village the ravens and rock doves are as tame as the sparrows here in London. But against this tameness must be set the Buddhist religion, which forbids the people from taking life. So, in order to avoid giving possible offence, we had to refrain from shooting in the neighbourhood of monasteries and villages, and that was a very severe drawback, as birds congregated principally about the cultivated lands round villages. In spite of this disadvantage we made considerable collections of mammals and birds, and we brought back a large number of dried plants and seeds, many of which it is hoped will live in the gardens of this country.

Crossing over the Jelep La from Sikkim into Tibet in the latter part of May, we found the country at 12,000 feet and upwards at the height of Spring. The open level spaces were carpeted with a purple primula (*P.*

*gammieana*) and a little yellow flower (*Lloydia*) and many saxifrages. The steep hillsides were ablaze with the flowers of the large rhododendrons (*R. thomsoni*, *R. falconeri*, and *R. aucklandi*), and the smaller *Rhododendron campylocarpum*, an almost infinite variety of colours. A descent through woods of pines, oaks, and walnuts brought us to the picturesque village of Rinchinggong, in the Chumbi valley. Here we found house martins resting under the eaves of the houses. From Rinchinggong we followed the Ammo Chu, the river of the Chumbi valley, upwards for four long days to its sources in the Tibetan plain. In its lower course, between 9000 and 12,000 feet, the valley was gay with pink and white spiræas and cotton-easters, red and white roses, yellow berberis, a fragrant white-flowered bog-myrtle, anemones, and white clematis. Dippers, wagtails, and the white-capped redstart were the commonest birds along the river-banks. About 12,000 feet is a level terrace, the plain of Lingmathang, where the stream meanders for 2 or 3 miles through a lovely meadow covered in the spring with a tiny pink primula (*P. minutissima*): it looks a perfect trout stream, but what fish there are are few and small in size. Between 12,000 and 13,000 feet you ascend through mixed woods of pine, larch, birch, and juniper, with an undergrowth of rhododendrons and mountain ash. The larches here have a much less formal habit of growth than those of this country, and in the autumn they turn to a deep golden colour. The berries of the mountain ash, when ripe, are snow-white and very conspicuous. In the woods hereabouts may often be heard and sometimes seen the blood-pheasant, and here also, though we did not see it, lives the Tibetan stag.

At about 13,000 feet at the end of May you find the yellow primula covering the ground more thickly than cowslips in this country; the air is laden with the scent of it, and growing with it is the pretty heath-like flower (*Cassiope*) with snow-white bells. Here and there were one or two of the large blue poppy (*Meconopsis sp.*), and a white anemone with five or six flowers on one stem. Soon the trees get scantier and scantier, pines disappear altogether, and then birches and willows and junipers, until only small rhododendrons are left, covering the hillsides like purple heather. In a few miles the country changes in character completely, and you come out on to the open plain of Phari. Here at 14,000 feet we saw the common cuckoo sitting on a telegraph wire and calling lustily. This is Tibet proper, and henceforward you may travel for many hundreds of miles and hardly see any plant more than a few inches high. In some places a little purple flower (*Incarvillea younghusbandii*) is fairly common; it lies prone on the sand with its leaves buried out of sight, and as we went westward we found the dwarf-blue iris (*I. tenuifolia*). Animals are few and far between. The kiang, the wild ass of Tibet, is occasionally seen in small parties, and now and again a gazelle; the Tibetan gazelle may sometimes be seen, two or three of them, in company with a flock of native sheep, and taking no heed of the shepherd, but when a stranger tries to

approach they are off like a flash. The only mammals that are commonly seen are the small mouse-hares or pikas (*Ochotona*), which live in colonies on the less stony parts of the plain, where their burrows often caused our ponies to stumble; they scurry off to their holes at our approach, but if you wait a few moments you will see heads peeping out at you from all sides. These gentle little creatures have been called whistling hares; they are not hares, nor do they whistle. The Tibetan name for them is Phüsi, pronounced very much like our pet name for the domestic cat. It may be interesting to record that on one of the pikas I found three fleas of two species, both of which are new to science. Larks of two or three species, wheatears, and mountain finches are about the only birds to be seen on these stony wastes. A small spiny lizard (*Phrynocephalus*) is common up to 17,000 feet; it lives in burrows under stones.

Rising out of the plain north of the Himalayas are ranges of limestone hills, 18-19,000 feet high, running roughly east and west. The hills between Phari and Khampa Dzong are the home of the big sheep (*Ovis hodgsoni*) which are occasionally seen in small companies. On the slopes of these hills are partridges (*Perdix hodgsoniæ*), and in the gorges are seen alpine choughs, rock pigeons, and crag martins. Once or twice at night we heard the shriek of the great eagle-owl, but it was never seen. At rare intervals on these plains one meets with small rivers, tributaries of the Arun river and so of the Ganges. Beside them there is usually more grass than elsewhere, and here the wandering Tibetan herdsmen bring their yaks to graze. The wild yak is not found anywhere in this region. It might be supposed that so hairy an animal as a yak would become dirty and unkempt. Actually they are among the cleanest of creatures, and they may often be seen scraping holes in soft banks, where they roll and kick and comb themselves into silky condition. Another animal of the plains is the Tibetan antelope (*Pantholops hodgsoni*), which is found a little to the north of the region we visited, but the only signs of it we saw were the horns used as supporting prongs for the long muzzle-loading guns of the Tibetans. This animal was probably the Unicorn described by the French priest Huc in 1845.

Here and there the rivers overflow their banks and form lakes or meres, which in the summer and autumn are the haunt of innumerable wildfowl; bar-headed geese and redshanks nest here, families of ruddy shelducks (the Brahminy duck of India) and garganey teal are seen swimming on the pools. Overhead fly sand-martins, brown-headed gulls, common terns, and white-tailed eagles. Near one of these lakes one day I watched at close distance a red fox stalking a pair of bar-headed geese, a most interesting sight, and had the satisfaction of saving the birds by firing a shot in the air with my small collecting gun just as the fox was about to pounce on his intended victim.

Tinki Dzong is a veritable bird sanctuary; the Dzong itself is a rambling fort covering a dozen or so of acres, and about its walls nest

hundreds of birds, ravens, magpies, red-billed choughs, sparrows, hoopoes, redstarts, wagtails, and rock doves. In the shallow pool outside the Dzong were swimming bar-headed geese and ruddy shelducks with families of young, all as tame as domestic poultry. The Dzongpen explained to me that it was the particular wish of the Dalai Lama that no birds should be molested here, and for several years two lamas lived at Tinki, whose special business it was to protect the birds.

Crossing over a pass of about 17,000 feet, the slopes gay with a little purple and white daphne (*Stellera*), said by the natives to be poisonous to animals, we came in about two days to a plain of a different character, miles of blown sand heaped here and there into enormous dunes, on which grows a yellow-flowering gorse. In the wet season this plain becomes a huge lake at the junction of the Arun river and the Bhong Chu, and it was from here that we saw our first view of Mount Everest.

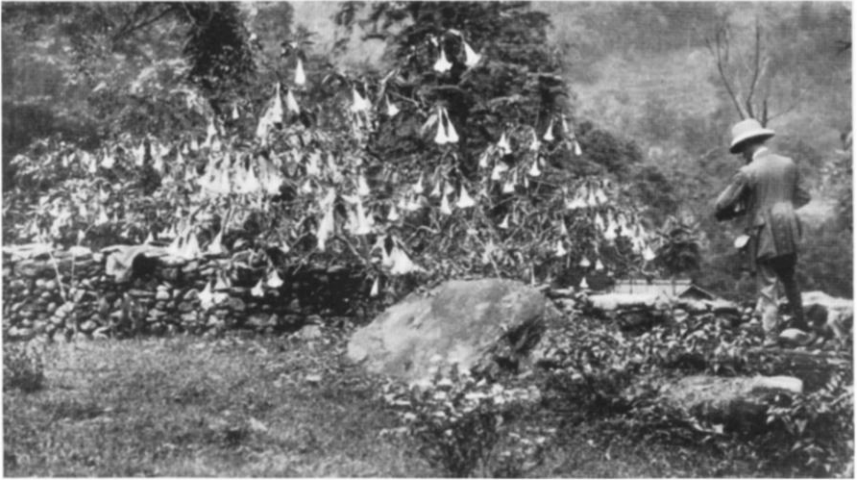
Following up the valley of the Bhong Chu we crossed the river by a stone bridge near Shekar Dzong. Here we found a colony of white-rumped swifts nesting high up in cliffs and ruddy shelduck nesting in holes among the loose boulders below. The slopes facing south were covered with a very pretty blue-and-white flowering shrub (*Sophora*); the foliage is a delicate silvery grey, and the plant would be a great ornament to English gardens.

At Tingri we found ourselves in a large plain about 20 miles long by 12 miles wide: a large part of the plain is saturated with soda, and is almost uninhabited by bird or beast. Along the rivers which traverse the plain is very good grazing for large flocks of sheep and goats. The sheep are small and are grown entirely for wool; the flesh, which was our principal food while we were in Tibet, has a pronounced flavour of lanoline. By means of a simple system of irrigation a large area of land near Tingri has been brought into cultivation. The principal crop here is barley, which constitutes the chief food of the people; they also grow a large radish or small turnip, the young leaves of which are excellent food. Iron ploughshares are imported from Nepal, and ploughing is usually done with a couple of oxen. The animals shown in the picture are a cross between the ordinary domestic ox and the yak, called by Tibetans "zoh." They are more powerful than the yak, and are excellent transport animals. We found barley grown in many districts up to 15,000 feet—it does not always ripen—and in the valley of the Dzakar Chu, near its junction with the Arun, is a small area where wheat is grown at an altitude of about 12,800 feet. Peas are grown in the Arun valley near Kharta, where they ripen in September and are pounded into meal for winter food of cattle as well as of the Tibetans themselves. I regret to say that I did not bring back specimens of these interesting and hardy cereals.

In the month of July Major Morshead and I made an excursion over about 150 miles of unknown country to the south-west of Tingri. Across the plain we came first to the village and monastery of Langkor, an



YELLOW PRIMULAS, UPPER TEESTA VALLEY, JUNE



DATURAS AT RONGLI



PLOUGHING WITH ZOH (OX × YAK)



EDELWEISS AT 16,500 FEET



HEADMAN OF KHARTA

important place of pilgrimage among Tibetan Buddhists. There is a pretty legend relating to the place, which ought to be remembered :—

Many generations ago there was born in the Indian village of Pulahari a child named Tamba Sangay. When he grew into a youth he became restless and dissatisfied with his native place, so he went to the Lord Buddha and asked him what he should do. The Lord Buddha told him that he must take a stone and throw it far, and where it fell there he should spend his life. So Tamba Sangay took a rounded stone and threw it far, so that no man saw where it fell. Many weeks and months he sought in vain until he passed over the hills into Tibet, and there he came to a place where, although it was winter, was a large black space bare of snow. The people told him that the cattle walked round and round in that space to keep it clear from snow, and in the middle of it was a rounded stone. So Tamba Sangay knew that the stone was his, and there he made a cell and dwelt until he was taken on wings to heaven. And the place is called Langkor, which means "the cattle go round," to this day. The people for many miles about had heard the stone as it came flying over the hills from India ; it made a whistling sound like "Ting," so the country came to be called Tingri, the Hill of the Ting.

Going west over the Thong La, at about 18,000 feet we found for the first time the beautiful little gentian (*G. amæna*). It is not easy to see until you are right over it, when it looks like a little square blue china cup ; some of the flowers are as much as an inch in diameter. Here also was just beginning to flower the dwarf blue poppy (*Meconopsis horridula*), one of the most beautiful plants in all that country. It grows in a small compact clump 6 to 8 inches high, with as many as sixteen flowers and buds on one plant. The flowers are nearly 2 inches across and of a heavenly blue. Going down from the Thong La we found, at about 16,000 feet, large colonies of marmots. The Himalayan is larger than the Alpine marmot, and it has a longish tail which it whisks sharply from side to side when it is alarmed : it has a twittering cry, curiously like that of a bird of prey.

Farther on the stream we were following opened out into an almost level valley about a mile wide, bounded on either hand by rounded limestone hills. Here and there were small villages, in the neighbourhood of which were numerous hares : it may not be generally known that the hare is occasionally a very foul feeder. The inhabitants have made very elaborate irrigation works in this valley, and here for the first time we saw crops of mustard, which add welcome splashes of colour to the rather drab landscape and have a delicious scent in the sunshine. The mustard seed is crushed for oil, which is burnt in monastery lamps.

At Nyenyam we found ourselves near to the great mountain Gosainthan (26,291 feet), of which I had had a glimpse from 20 miles' distance, two glorious peaks like mighty Matterhorns ; but though we walked many miles up the main valley leading towards it, we saw nothing but fog. On

an island in the torrent of that valley I saw a pair of the curious curlew-like birds, the ibis-bill (*Ibidorhynchus*), evidently with eggs or young, but it was impossible to reach them. The most conspicuous flowers in this valley were a little bushy cistus with golden flowers the size of a half-crown, a white potentilla with red centre, which carpeted the drier hillsides, and a very remarkable louse-wart (*Pedicularis megalantha*) with two quite distinct forms, one purple, the other yellow.

At Nyenyam the river we had been following from the Thong La plunges into a gorge many thousands of feet deep and cuts through the main chain of the Himalaya to join the Kosi, a tributary of the Ganges, in the lowlands of Nepal. Turning back eastwards in the direction of Mount Everest we crossed several passes of 17,000 or more feet and valleys narrowing into gorges similar to that of Nyenyam. Going up to one of these passes, we found at an altitude of about 15,000 feet the ground for an acre or more covered with an almost pure white primula with a very delicate primrose scent (*Primula buryana*). Near there passing through the holy mountain-side of Lapche Kang we came to the temple of Lapchi, which is well known to all Buddhist India and Tibet, and is visited by thousands of pilgrims yearly. This was formerly the abode of Mila Respa, a Tibetan incarnation of Buddha. He lived in this mountain valley, and the faithful may still see his footprints in certain caves. He seems to have been an unusual kind of saint, who liked to have his little joke. The following story, which was told by the lama in charge of the temple at Lapche, has a certain interest for naturalists, and may be related here :—

He was walking with a disciple on the mountain one day, when they found an old yak's horn lying in the path. Mila Respa told the disciple to pick it up and take it with him. The disciple refused, saying that it was useless, and passed on not noticing that the saint himself had picked up the horn and put it under his cloak. Soon afterwards a mighty storm descended on them—whether or not it was caused by the saint is not known. He took the horn from under his cloak and crept inside it. "Now," said he, when he was safely sheltered from the rain, "you see that nothing in the world is useless."

Growing about the rocks in this neighbourhood is a very pretty pink-flowered polygonum (*P. vacciniifolium*), which rambles somewhat after the manner of a cotoneaster. A bird which I did not see elsewhere in Tibet was the wall-creeper, which was constantly seen climbing about the temple and the big boulders of Lapche.

Going south and east from Lapche we crossed more high passes, and near the top of one of them we found one of the most beautiful blue primulas in the world. Each flower has from three to six bells about the size of a thimble, lined inside with a kind of frosted silver (*P. wollastonii*). It was not long after finding this blue primula that we saw for the first time in nearly three weeks one of the great snow mountains that surrounded



us. During most of that time we had seen little but clouds and fog. Apart from the remarkable beauty of its form this peak has a peculiar interest of its own. Our friends the late enemy always insisted on labelling Mount Everest Gaurisankar, but this mountain 36 miles west of Everest is the true and only Gaurisankar (*Journal*, Feb. 1922, No. 22). At the foot of this mountain flows the Rongshahr river, at this point about 10,000 feet above sea-level. We followed up the Rongshahr valley, notable at that season of the year for its excellent wild gooseberries and its red roses, to the Phüsi La, and thence we followed the tracks of Colonel Howard-Bury and other members of the expedition to Kharta in the Arun valley, about 20 miles east of Mount Everest.

Kharta is curiously situated as regards climate—the wide dry open valley of the Arun narrows abruptly and the river passes into a deep narrow gorge, where it falls rapidly at the rate of about 200 feet to the mile. The monsoon clouds roll up the gorge to its mouth, where they are cut off sharply, so that within a mile you pass from the dry climate of Tibet to the moist steamy air of a Nepalese character with its luxuriant vegetation. The Kharta valley joins the Arun here from the west, and is practically on the border between these two climates, getting many hours of sunshine in the day and very frequent falls of rain, with the result that the crops of barley grown are as fine as can be seen anywhere. There is a considerable population, of a more enlightened kind than we had met hitherto; some of them even grow flowers for pleasure. The gentleman shown in the plate, our particular guardian at Kharta, was not only an accomplished musician and dancer, but he was also a keen horticulturist; he had a pretty garden of his own, and one day he presented Colonel Howard-Bury with a pot in which were growing marigolds, kosmos, a mallow, and some barley.

About the larger houses in this region are usually planted poplars and junipers, and it was about 10 miles from Kharta that we saw a big poplar nearly 40 feet in girth; we were told that it was 500 years old.

From Kharta we made excursions to the Kama valley, a journey of about two days to the south-west. After climbing to a low pass of 15,000 feet we came to a valley filled with a dozen or so of small lakes or tarns of wonderful colours. They appeared to be inhabited only by tadpoles; no signs of fish were seen. Here were growing large beds of purple and yellow iris (allied to *I. sibirica*); the steeper banks were blue with a very striking campanula (*Cyananthus pedunculata*), growing out from the dwarf rhododendrons in dry places were tall spikes of a claret-coloured meconopsis, now going to seed—some spikes had as many as twenty seed-pods—and growing in the moist places beside the lakes and streams was the tall yellow primula (*P. elongata*), growing to a height of 30 inches. Over another pass, the Chog La (17,000 feet), we began to go down into the Kama valley. At about 14,000 feet we picked a quantity of wild rhubarb, a far better vegetable than the tame variety; and a little lower

down we came to large blue scabious, 3 to 4 feet high, a big dark blue monkshood, and quantities of the tall yellow poppy. Rhododendrons, birches, and junipers begin at about 13,500 feet, and at 12,000 feet the junipers are the predominating tree; they are of immense size, upwards of 20 feet in girth and 120 to 150 feet high, and of a very even and perfect growth. Here we met with the Sikkim black titmouse (*Parus beavani*), and a little lower down amongst the silver firs (*Abies webbiana*) we came upon bullfinches (*Pyrrhula erythrocephala*). At 11,000 feet I saw a langur monkey (*Semnopithecus entellus*), the only monkey we saw in Tibet. In the open spaces among the trees grew many parnassias, a tall green fritillaria, and a very sweet-scented pink orchis. We went down through bamboos, rhododendrons, and magnolias to the almost tropical heat of Lungdö, about 8000 feet, near the junction of the Kama with the Arun river, where the blue pine grows. After an excursion to the Popti La, one of the principal passes from Tibet to Nepal, where we were astonished to find at 12,000 feet an abundance of very active leeches, we returned to Kharta.

Early in September we started up the Kharta valley on our way towards Mount Everest; by that time the harvest of peas and barley was already begun. At this season the rhododendrons and many other plants were beginning to seed, but some of the gentians were at their best, particularly *Gentiana ornata*, which carpeted the ground with a variety of blues. Near our camp at 17,000 feet, along the edges of streams, a very handsome dark blue gentian (*G. nubigena*) with half a dozen flowers growing on a single stem was very conspicuous, and growing with it was an aromatic little dwarf purple and yellow aster (*A. heterochaeta*). In the stony places grew up to 19,000 feet the dwarf blue poppy (*M. horridula*) mentioned above, and many saxifrages, notably a tiny little white one (*S. umbellulata*). On the steeper rocks from 16,000 feet to the snow-line (roughly 20,000 feet) were found edelweiss (*Leontopodium*) of three species. Very noticeable at these altitudes are the curious saussureas, large composites packed tight with cotton-wool: if you open one of them on the coldest day, even when covered with snow, you find it quite warm inside, and often a bumble-bee will come buzzing out.

Another very interesting plant at 17-18,000 feet is a dwarf blue hairy delphinium (*D. brunonianum*) with a strong smell. The Tibetans dry the flowers of this plant and use them as a preventive against lice, without conspicuous success. When a Tibetan dies, his body is undertaken by the professional butcher, who cuts it up and exposes it on the hills to be disposed of by the vultures and wolves. A body tainted with the delphinium flowers is unpalatable to the scavenger, and it is well known that a man must have been wicked in life whose body is rejected by the vultures and wolves. The highest plant we found was a little *Arenaria* which grows among the loose stones to 20,000 feet and above.

Animal life above 17,000 feet is scanty. Our camps at 17,000 and



LOWER VALLEY OF THE KAMA CHU



LEPCHA COLLECTOR HOLDING SAUSSUREA



500 YEAR OLD POPLAR AT LUMEH



LOOKING BACK TO DOCHEN

20,000 feet were visited daily by ravens, black-eared kites, red-billed and alpine choughs, and lammergeiers. The large Tibetan snow-cocks were very conspicuous and noisy on the slopes between 17,000 and 20,000 feet. Pikas (*Ochotona*) of a new species was found from 15,000 feet to the snow-line, and small voles were common at 17,000 feet. At about the same altitude a small black rat lived among the great boulders of the moraines, but we never succeeded in catching one, and in the same place lived a very dark brown wren of a new species of which only one young bird was brought home. Mice of some kind came into our tents at 20,000 feet and ate our food, but escaped without being seen. Burrel were often seen at 18-19,000 feet and their tracks at 20,000 feet. Wolf, fox, and hare were all seen above 18,000 feet, and undoubted tracks of both fox and hare were seen on the Kharta glacier at 21,000 feet, at which height also I saw a hoopoe flying across the glacier, and a small hawk, which appeared to be almost white underneath, flying swiftly overhead.

A few hundred feet higher, about 21,500 feet, we came across those tracks which afforded such fun to so many people. It is not necessary to assure a scientific society that there are no such creatures as "abominable snow men," that apes are not alpine climbers, and that Himalayan bears do not make excursions to 10,000 feet above the last fruit-bearing tree. There can be no doubt, I think, that the tracks we saw were those of a wolf loping along at a good gait; the snow was soft, and the tracks had got partially merged together. Curiously enough, I have in my own experience come across similar stories of wild men in high mountains in such widely separated regions as Ruwenzori in Central Africa and in Dutch New Guinea, and I believe them all to be equally devoid of foundation.

The photograph (*Journal*, Feb. 1922, No. 21) taken from our camp on Lhakpa La (22,350 feet) is interesting not only because it shows the north col and the beginning of the slope by which the attempt on Mount Everest is to be made, but also because when I was taking this photograph I saw come sailing over this peak to the right, that is the north peak of Everest, 24,730 feet high, and apparently high up above the peak, a lammergeier or bearded vulture, a bird which soars and sails and never flaps its wings except at the moment of getting off the ground. The means by which so large a bird moves without effort in so rare an atmosphere, about one-third of the normal, is worthy of the attention of aviators.

The photograph of the summit of Mount Everest (*l.c.* No. 12) has another significance for diligent inquirers. For some weeks before we came within reach of the great mountain we heard from the natives rumours of the Snow Frog. This mysterious reptile is said to live only at the tops of the highest mountains, and its blood is an unfailing remedy for all diseases of the body and of the soul.

Much has been written and talked about the wonderful colours of

Tibet; it is impossible to exaggerate them, and it is much to be hoped that this year's expedition will bring us back something more than photographs. But nothing has been said about that country's smells. I am not thinking so much of the rank savour of a Tibetan village, nor of the peculiar bouquet of the Tibetan person, nor of the acrid taste of the smoke of yak-dung which flavoured all our food for five months. I am thinking rather of valleys laden with the smell of roses, of meadows carpeted with sweet-scented primulas, and of the delicious fragrance of rhododendron leaves trodden underfoot on a frosty morning in September. These are things which we shall remember long after the petty worries of Tibetan travel are forgotten.

In conclusion, I must thank the authorities of the Natural History Museum and of Kew Gardens for the care with which they have worked out our collections.

Before the paper the PRESIDENT said: It was a very great disappointment to us that at our Mount Everest Meeting at the Queen's Hall at the end of December, time did not permit of Mr. Wollaston giving us an account of the natural history of the Mount Everest region. That disappointment is made up for by our having him here this evening, when we can hear his account at far greater length and shall have the advantage of being able to discuss it in a way we should not have been able to do at the Queen's Hall. I have great pleasure in introducing to you Mr. Wollaston, the distinguished naturalist of the Mount Everest Expedition.

*Mr. Wollaston then read the paper printed above, and a discussion followed.*

Sir DAVID PRAIN (Director, Royal Botanic Gardens, Kew): I will not at this hour detain the audience long, but I would like to take this opportunity of saying to the President of the Society, to the members, and to those who have been responsible for organizing the Expedition, how great a pleasure it was to me to have an opportunity of assisting in working out the small collection of plants that Mr. Wollaston and his friends were able to make. A predecessor of mine in Calcutta, Dr. Wallich, as long ago as 1821 was asked to visit Nepal when Sir Robert Colquhoun of Luss was the Resident there and was able then to arrange to secure collections of plants from Gosainthan. Another predecessor of mine in Calcutta, Sir George King, from 1871 onwards made it his business to endeavour to have a complete survey made of the vegetation of the valley of Chumbi and the plain of Phari to the north of it. Knowing as we did practically the whole of the plants from Chumbi and Phari to the east, and having very considerable collections from Gosainthan to the west, it was not to be expected that many new plants would be brought home by the Mount Everest Expedition. A certain number there are; six or seven, perhaps, and you could not help finding a few when so large an area was so carefully examined by the members of the party. But the great interest of the collection is that it fills up a gap between two areas that have been fairly well known; one for about a hundred years and the other for about fifty years. The lousewort that Mr. Wollaston has mentioned is a very handsome plant in both its forms, one with pink blossoms, the other with yellow. It is very interesting

to me, because I happened to make a special study of those plants a number of years ago—I do not like to say how many now—and I found then that the yellow one is a very characteristic plant of the North-West Himalaya, whereas the pink form is an equally characteristic plant of the Eastern Himalaya. Except as regards the colour of the flower, it is really hardly possible to distinguish one from the other, and it is extremely interesting to find that Mr. Wollaston had the privilege of being just in that part of the Himalaya where the areas of these two plants meet and to see them slightly overlap. In conclusion, may I repeat the pleasure it has given me to see those plants, and to say how indebted we all are to the Mount Everest Committee for having enabled the members of the Expedition to make a collection of plants for us?

Sir SIDNEY F. HARMER (Director, Natural History Museum): It is a special pleasure to obey your commands, Mr. President, and make one or two remarks with regard to Mr. Wollaston's address this evening, because he is an extremely old friend of mine whose acquaintance goes back to the time when he first entered as an undergraduate at a Cambridge College. Since then I have been further indebted to him by being able to read some of his charming books in which he has described the results of his travels abroad, books in which his word-pictures have been so vivid that they are capable of transporting one to the localities described and helping one to enjoy the pleasures of travel which one will probably never be able to experience in one's own person. In the course of his remarks this evening Mr. Wollaston gave us a very interesting story showing that even the discarded horn of a yak is not without its utility. I think it was somewhat earlier in his remarks that he mentioned the fact that he had discovered two species of fleas, and I noticed at the time that there was a little disposition to think that a subject for mirth. If the earlier story had preceded the mention of the fleas, you would perhaps have taken a somewhat different view of it, because if there is one thing that is certain it is that the systematic study of fleas is one of the really important things in this world. I do not mean that to be a humorous statement. I believe it to be strictly and literally true. In large areas of the world the plague is transmitted by the agency of fleas, and a knowledge of the species and the life-history of those insects is of the very greatest importance. By a curious coincidence Mr. Wollaston also mentioned the subject of marmots, and here again the marmot is an animal which has been accused of being largely instrumental in transmitting one of the most dreaded diseases that occur in the Asiatic continent, the disease known as pneumonic plague. We may safely assert that even in cases where the study of a particular animal would appear to have very little significance, it may, on the contrary, be of the greatest importance. But quite apart from the possible economic aspects of the question, we are extremely interested in knowing what there is to be found in the region of Mount Everest, and in any unexplored part of the world. I have great pleasure in welcoming any co-operation between this Society and the Natural History Museum in further investigating questions of this kind. The fauna of Mount Everest was of interest to us largely because it is a part of the world which has been quite unknown zoologically, and from which we had no collection. A theory has recently been propounded to the effect that the mountain summits are places where life probably originated on this globe, the idea being that when the world was cooling down the mountain summits were the first places which came to acquire a temperature sufficiently low to allow life to come into existence. I may say at once we did not expect to find

any trace of this ancient history, even if that theory should be correct, which is by no means certain. The mountains are probably far too recent for that. But Mount Everest was a district of which we knew very little, and we are extremely glad to have had this opportunity of learning more. We could hardly expect that, standing as it does on the line between the great Palæarctic area to the north and the Oriental region to the south, we should find anything of extraordinary novelty. In this respect our experience corresponds with that of Sir David Prain. No conspicuously new types of animals were discovered, but we did not expect it. The collection consisted largely of birds, among which we found not only representatives of species commonly seen in our own country, but also representatives of other birds not quite the same, but differing specifically from those we have here. One of the interesting results was in connection with certain birds which were found nesting high up on Mount Everest. It is well known that some of these birds, waders in particular, are in the habit of seeking high latitudes, such as the Arctic Circle, for instance, in which to nest. Why they do it is perhaps not quite obvious. But it is interesting to find that here we have a case in which a bird, instead of going a long journey towards the far north, is able to reach a high altitude and thus get the sort of Arctic conditions in which it rejoices in order to undergo its nesting period. Then in addition to birds there is an interesting little collection of mammals, including a new form of the animals which Mr. Wollaston has referred to as whistling hares. We are rather disappointed that he did not bring home any of the rats and mice which he has told us invaded their tents at certain times, but we hope that the next Expedition will be more successful in this respect and that the animals in question may prove interesting. In addition to this the collection included a few insects, there being some butterflies and moths and one or two batrachians, and among the latter a very interesting new form. The collection is one which we are extremely glad to have, and we are greatly indebted to the Expedition and to Mr. Wollaston for having made this addition to our national collection.

Mr. N. B. KINNEAR: Mr. Wollaston is to be congratulated on the collection which he has brought back. We have heard of the number of things he had to do: besides collecting animals, he had to collect plants and at the same time look after the health of members of the Expedition. The first thing that strikes one on looking at the collection of birds is the extraordinary worn state of plumage which most of the specimens are in. This I think is due, to a great extent, to the high elevation at which the birds were taken, and probably, in the more exposed parts, to the winds to which they were subjected. In a general survey of the collection one finds, of course, that the birds come from a great variety of localities, so it is rather difficult to generalize, but about a half are resident or semi-resident in the Himalayas, that is, birds which move up and down the Himalayas according to the seasons. Of these we might mention the four different kinds of Accentors, birds like hedge-sparrows; the different kinds of finches, Rose Finches, Snow Finches and the Ground Finches; Cinnamon and Tree-sparrows; Snow-pigeon and Snow-partridge. About a quarter of the birds are made up of summer visitors, which simply go to these high altitudes for the purpose of nesting, and during the cold weather are found in the plains of India. These include the Indian Stonechat, Desert Wheatear, Hodgson's Rose-finch and the Short-toed Lark, Redstarts, Wagtails, several Pipits, a Redshank and the Tibetan tern. A few birds are confined entirely to the northern side of the Himalayan Range; we do not get them on



the southern slope at all. They are the Brown Ground Chough, a small bird about the size of a thrush with a bill like a chough, which runs about the ground and goes in small flocks; Prince Henry's Babbler, Walton's Turtle, and perhaps the Tibetan Sky-lark, described some years ago from the south-east of Tibet, its breeding ground being at the head of the Chumbi Valley. Where this last bird goes in winter is not yet known. There are in the collection only two birds which were true migrants, birds which were simply passing through. One is Temminck's Stint and the other a wagtail. Perhaps the most curious bird of the whole collection was the Pied-crested Cuckoo. This is a very common bird in the plains of India, and as a rule it is never found above 5000 feet, but extends from Kashmir right down to Cape Comorin and is a local migrant. In the beginning of the monsoon a certain number of them come to Bombay, and for some reason or other they are always pursued and harried by the common House Crows. Why they do it, I do not know, because this cuckoo does not lay in the House Crow's nest, but in the nest of babblers. One can only suppose that this cuckoo in the foothills of the Himalayas was mobbed by House Crows and started wandering up, gradually lost itself, and eventually turned up at, I think, about 14,000 feet. Temminck's Stint, about the size of a sparrow, which nests on the borders of the Arctic Ocean, was very interesting, especially because I think Mr. Wollaston told me the place at which it was found was about 17,000 feet, and to get there it had to fly over a range of 22,000 feet. This shows that high mountain ranges are no barrier to some birds, at least on migration. This is very interesting to learn. Of course we knew a certain amount about the heights over which birds will migrate from the observations made by the different naturalists on the first and second Yarkand Expedition. As Sir Sidney Harmer said, a certain number of the birds are very similar to those found in this country. I might mention the Himalayan Blackbird, which is practically the same as our blackbird, only it is larger; the Tree Sparrow, the Redshank, and Hodgson's Rose-finch which is very similar to the Common Rose-finch; the Hoopoe, Temminck's Stint, and the Dusky Redshank are all the same as you get in this country; and the Indian stonechat, which is very like our stonechat but slightly different, has been found in Norfolk on migration. The Himalayan Alpine Accentor, which was one of the birds seen highest up, is very like the Alpine Accentor found in the Swiss Alps, and one of the snow-finches, Adams' Snow-finch, discovered a great many years ago in Ladak, is practically the same as the snow-finch of the Alps. I do not think there is anything more to say about the birds. They are an interesting collection.

Mr. W. R. DYKES (Secretary, Royal Horticultural Society): I did not at all expect to be called upon to make any remarks on the seeds found during this interesting Expedition. If I may say so, what we have realized so far is that a great number of these plants may be difficult to grow in this country. The various kinds of Meconopsis especially are very difficult, and so are the high Alpine primulas. This year we should be very glad to get seeds of the cereals and of the common plants. Mr. Wollaston told us of the wild gooseberries which they ate going up one of the valleys, but we have not yet got seeds of that gooseberry, although we should be glad to have them. Then I believe a raspberry was found high up of which we should also like to have seeds, and we hope that the results of the Expedition of last year will show those who go out this year that even the commoner plants might be brought back and prove of more permanent value in this country than some of the seeds we have already received, such as the various species of meconopsis and

primula. The irises mentioned interested me especially ; all that I have seen of the seeds that have been brought back are of the *Sibirica* section. There are, we know, several irises closely related to the *Iris sibirica* in the Chumbi Valley and higher up. But I think the yellow and purple iris which Mr. Wollaston mentioned as growing high up is probably unknown to us, and I think not *nepalensis* but some other species. I have not yet seen that specimen, and I did not know it had been identified as *nepalensis*.

Mr. FRESHFIELD : I feel somewhat abashed at following in the train of so many distinguished representatives of the Natural Sciences. To what has gone before I can, I fear, only contribute a single observation as to the high flight of migratory birds. On the Bezingi Glacier on the north side of the Caucasus, at the point where the watershed attains its maximum height, 15,000 to 17,000 feet, Signor V. Sella found the ice strewn with the skeletons of ducks, larks, and quails, besides others that were unrecognizable. The poor things had evidently been caught in a blizzard. But why, when they had an easy flight open to them along the coast of the Black Sea, did they choose to face the great ice-wall that towers over Suanetia ?

I turn to some more general remarks, which the fact that this is the last meeting at which we shall have any of the members of the 1922 Mount Everest Expedition with us before they start, may render not inopportune.

The other day my friend Captain Farrar, who has been so active in looking to the equipment of the party, accused me of being a pluralist on the ground that I was the only man who had served both as President of our Society and of the Alpine Club. I should not have run the risk of losing any reputation I may have for modesty by repeating Captain Farrar's remark to-night had I not recognized that it indicated and summarized a development of which the Mount Everest Expedition is the most notable expression. I refer to the union of our Society and the Alpine Club for a common object. Since the time, now over forty years ago, when I first became one of your Honorary Secretaries, the establishment of mountaineering in its proper place in the field of geographical discovery and research has been one of the principal objects of my life. There was a date, still within living memories, when in Savile Row we were so engrossed in African swamps and Arctic icebergs that we had little or no time for mountains. Here is one notable instance : so distinguished a traveller as Sir Joseph Hooker had to wait a quarter of a century after the publication of his classic 'Himalayan Travels' before he received our Gold Medal. Those days are happily long past, and we may look forward with confidence to further co-operation between the Society and the Alpine Club in the exploration of the vast mountain region that spreads across Asia from China to Afghanistan.

Next I desire to congratulate the members of this year's expedition on having been successful where the Survey of India had after fifty years of intermittent endeavour succeeded only in failing. They have ascertained, and that through an official source, the local name for the highest mountain in the world. The Tibetan passport for the 1921 party was made out for the exploration of Chomolungma ; this, we are told, means being translated "The Mother Mountain of the Country." I am not going to revive to-night the old controversy as to the propriety of imposing upon the peak an English name. This, I fear, must now be allowed to be a matter settled for better or for worse. But I do desire to insist that the mountain's authentic local name shall henceforth be inserted on our maps (in brackets if you like) alongside of its English pseudonym. I urge this not only as a matter of courtesy to our Tibetan hosts, but also as one of proper regard to our own rules of nomenclature. We have laid down

that the ultimate authority as to geographical names is the Government of the country in which the objects are situated. The Monarch of Mountains rises not in British territory but in Tibet, and it is only by making a special exception to our rule that we can call it by any but its Tibetan name. May I in the same connection express my hearty sympathy with the action of our climbers in submitting Tibetan names—names that will be intelligible to the people of the district—for the minor peaks that they found to be nameless? This is what Prof. Garwood and I attempted to do twenty years ago in the neighbourhood of Kangchenjunga.

I have been led to mention Kangchenjunga. Allow me a brief digression. It is obvious that the Mount Everest Expeditions are likely to give a fresh impulse to Himalayan climbing and exploration. It may therefore be opportune to remind ourselves that there exists, a week's journey from Darjeeling, a mountain mass only 1000 feet lower than Mount Everest and accessible without frontier difficulties or political hindrances. I would invite the Indian Government to take steps to make it even more accessible. I recognize that the moment is unfavourable. The Government is hard up; we are all hard up. But the request I make is extraordinarily modest. Paths good enough for mules or laden coolies on both sides of the Guicha La, and for the few miles through the forest from Lachen to the foot of the Zemu glacier, a couple of stone huts, such as we have in the Alps, one at Alukthang, one on the Green Lake plain at the head of the Zemu; these facilities would enable mountaineers to penetrate the gaps and climb the minor peaks round Kangchenjunga and to explore further the approaches to that magnificent and most formidable mountain. They would further afford a party of surveyors a delightful opportunity to ascertain whatever errors Prof. Garwood and I may have fallen into in the map we produced, under difficulties, twenty years ago.

I return for a few last words to Mount Everest, but, since I have mentioned maps, may I here express a hope that a revised version of the general map of the mountains between Makalu and Gaurisankar, given with the February number of the *Journal*, may before long be produced by the Survey? In such a region a map that leaves out any indication of the main watershed is like the play without Hamlet, or rather like a play without any plot at all. The detailed map of the approach to Mount Everest, on the other hand, is highly commendable as an adequate and apparently correct representation of physical features and of the relation of the glaciers to the mountain structure. It is an interesting example of the use photographs may be in cartography.

Finally, the question before all our minds to-night is, "Can Mount Everest be climbed this year?" We have been told on the best authority that the chances are fifty to one against success. I am not in a position to dispute that statement. It is obvious that success must depend on a rare and happy combination of circumstances. First, the mountain must be in the best condition and the weather set fair; next, you must have the *right* climbers. By right I do not refer to climbing capacity, as to that we are assured we have the best men, but to individuals exceptionally immune from the effects of the rarity of the air. In this respect climbers vary greatly. At a height of over 20,000 feet I have seen some of my party run about in the snow as if they were on a beach at sea-level, while others were suffering from divers degrees of lassitude. For myself I felt nothing until I walked uphill, but then I lost breath relatively quickly; that was at the age of fifty-five. It is difficult to ascertain beforehand each individual's sensitiveness, and even in the same man his powers may vary on different days.

I would conclude with certain grounds for hopefulness brought to light by last year's reconnaissance. The final climb appears to offer no very serious obstacles except that of altitude. The next 4000 feet above the North Col are not too steep. Before the monsoon much of this slope may prove rock, and at any rate there are crags that promise sites for a bivouac at 26,000-27,000 feet. Easy rock is far less tiring than snowslopes. The final ridge above the shoulder looks roomy, though the last 200 feet may be steep. Exhaustion ensues far less quickly on airy ridges than in hot and soft snow basins. Nor need we infer from last year's experience that high winds prevail perpetually on the summits. During the two months I was in Sikkim in the autumn of 1899 I never met a gale or saw the snow flying from the ridges. We are not yet in a position to generalize.

*Nil desperandum* is a good motto for mountaineers. Hope for success, and imbue as far as possible your companions and followers with the same feeling. By so doing you will diminish the odds against you by one-half—they will still be heavy enough.

THE PRESIDENT: Mr. Wollaston began his address by telling us how well the party were during last season. The Chinese go on the principle of paying their doctors as long as they are well and not paying them when they are ill. On that principle, I think we must congratulate Mr. Wollaston. Mr. Wollaston said that it was a misfortune that in certain places they were not allowed to shoot. This year the Tibetan Government have made a representation to us that the Expedition should not shoot in Tibet. That has the great disadvantage that the Expedition this year will not be able to bring back the same amount of natural history collections that the Expedition last year brought back. But, on the other hand, I hope they will have very special opportunities of observing wild life, which in Tibet is so much tamer than elsewhere. We have fortunately this year been able to send a special photographer, who will have nothing else to do but to photograph, and I am sure Captain Noel will take the hints that have been given this evening and bring us back photographs and cinematographs of the wild life of that country. So that it may not be altogether an unmixed blessing that there is to be no shooting. The time is late, but I know perfectly well that you will wish me to thank Mr. Wollaston for his exceedingly interesting address. It has been most fascinating to listen to him, and I think we are all rewarded by this opportunity that has been given us to make up for what we lost at the Queen's Hall.

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## THE TIGRIS ABOVE BAGHDAD

Lieut.-Commander A. S. Elwell-Sutton, R.N., B.A.

*Read at the Meeting of the Society, 3 April 1922.*

THIS is an account of the work done by one of H.M. gunboats on the river Tigris above Baghdad in 1918. From a geographical point of view the importance of it lies, perhaps, in the survey of the river between Samarra and Tikrit, which was carried out at the request of the G.O.C. 1st India Army Corps with a view to its navigability; but some account of our experiences generally may be of interest.

So far as has been ascertained there have been only three attempts to