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students of all denominations. To some extent, therefore, it should be supported by all the students. It should, indeed, be regarded as a general club which all are entitled and expected to use and support and in which those who live in European style will also have their meals."

### THE NORTH KAMRUP GAME SANCTUARY, ASSAM.

BY A. J. W. MILROY, I.F.S.

To be in charge of a Game Sanctuary is a piece of luck that comes to few, and an account of what is being done in this Province to preserve the fauna of the country may be of interest. Not so many years ago, Sir Harry Johnstone severely criticised the Government of India for its indifference on the subject of game preservation, but Assam had already established a number of sanctuaries, and since then a Game Association has been formed in one of the Tea districts for the purpose of managing certain shooting preserves in conjunction with the Forest Department. The Kamrup Sanctuary, of 57,600 acres, was gazetted a Reserve in 1907, the main object in view being the saving from extinction of such *rhino* as still survived locally. It is situated in the extreme north-west corner of the district, bounded on the west by the Monas river, on the north by Bhutan, and on the east and south by waste land, so that its reservation inflicted no hardships on any of the inhabitants of the district. Across the Monas is another Sanctuary under the D. F. O., Goalpara.

The south portion of the Reserve is chiefly swamp with higher grass lands in between, a nasty treacherous piece of country, which seems to have become more water-logged since the earthquake of 1897. *Acacia Catechu* and *Albizias* are sprinkled over the grass savannahs.

The central portion is alternating prairie and dense moist evergreen forest, containing almost impenetrable patches of cane: some of the more interesting trees are *Morus laevigata*, *Amoora spectabilis*, *Cedrela Toona*, *Duabanga sonneratioides*, *Cinnamomum glanduliferum*, *Artocarpus Chaplasha*, etc. The north portion

slopes gently up to the Himalayan foot-hills, and consists of grass afforested, often rather sparsely, with deciduous and fire-resisting species such as *Acacia*, *Albizzia*, *Gmelina arborea* and various *Bauhinias*. On account of the remoteness of the Reserve from any market the present demand for timber from it is practically nil.

There were formerly three favourite shooting grounds for rhino in this part of Kamrup, and two of these have been included within the Sanctuary; the third was omitted, possibly because all the rhino had been shot out, but as they are again to be found there now, the Local Administration has been asked to sanction the reservation of the area as an addition to the Sanctuary, as it is uninhabited and, for the most part, undrainable swamp.

There can be no doubt that Government acted none too soon on the rhino's behalf. His horn and flesh are of such value to Hindus that a number of local shikaris made their livelihood by killing rhino, and, but for the thickness of his skin and wonderful general vitality, and the poor quality of the shikaris' powder, there would be no rhino left alive here to-day. I have heard of 17 native bullets being dug out of a dead rhino, some of which must have been in him for years.

While it is a desperate animal to attack on equal terms, it is easy game to the pot-hunter on account of its habits of using the same tunnels through the grass and of depositing its dung in the same places, so that, given a properly placed *machán* and patience, success is bound to come sooner or later to the happy shikari.

Europeans and native sportsmen using elephants also did the stock great harm by shooting an undue number of cows, and there are many men who can show trophies from cows and none from bulls. The sexes are so similar in appearance that no one can be blamed for making mistakes on this score; the mischief was done by following up family parties of rhino. A bull and a cow with her calf are commonly found together, and on being disturbed the bull generally clears out at once, leaving the cow to face the danger while her calf makes for safety. As a rule, under these circumstances, the cow asks for trouble by charging her pursuers bald-headed, and consequently usually gets it in the neck. Another

annoying habit the cow rhino has is that of leaving her calf in some hidden place while she goes off to graze, so that any one coming on her track thinks he is after a solitary bull, until after a time the calf chips in unexpectedly.

The Sanctuary has only once been invaded officially, when Lord Minto shot here in the beginning of 1909.

His action created a considerable amount of resentment amongst the Europeans of the Province, and it is only fair to say that he had been completely deceived as to the state of affairs. His information was that this Sanctuary swarmed with rhino, and that there were none outside, and by the time that letters appearing in the Press had undeceived him on this point, the whole *bundobust* had been made and the shoot had to go on as arranged.

No one could accuse Lord Minto of not being a sportsman, and, as soon as he understood that he had been misinformed, he promptly limited himself to the bagging of one rhino, and did not allow his suite to shoot at all.

He got his one rhino but only after a deal of trouble. Rhino are difficult animals to drive at any time, and on this occasion the beating arrangements were not in the hands of the then D.F.O., Mr. D. P. Copeland, who knew the locality inside out, or of any one with local knowledge. Attempts were made to drive the rhino by *force majeure* (as represented by over 70 elephants) in directions that they did not wish to go. Now the rhino is not an animal that allows itself to be put upon, and what happened over and over again was that a rhino disturbed by the advancing elephants would trot out, survey the long line and then charge with its unearthly burbling at what appeared to it to be a weak link in the chain. The line as invariably broke, for the elephant that will face a rhino is a real rarity, and much time was lost in getting the quaking 'hathis' (elephants) back into line for a further advance.

One elephant, caught as it was turning round to bolt, was bowled completely over by a rhino. A well-known staunch tusker was in one beat posted as a stop, but had the bad luck to be in the way of a particularly irate cow, which, with its half-grown calf, was not in any mood to be stopped. The old tusker, somewhat

surprised not to hear the expected bang from his back and see the evil beast swerve off, had to do something for his reputation, so he bravely pinned the cow down with a tusk on either side of her neck, but the calf starting to slash him from behind he had to release the mother from Chancery and fly for his life.

As most people know, the offensive weapons of the Indian rhino are his tushes and not the horn, and, I must say, it is a fearsome thing, if one has time to look back, to see the open red mouth with the wicked tushes close behind one's elephant's heels.

I can never understand why those who manage shoots for Princes and Viceroys always aim at driving all the game to them; perhaps it is to guard against blank days.

If any one wants excitement without undue personal risk, he can always be sure of getting it by following up a rhino on an elephant, whereas it must be difficult to fail to down a poor old rhino driven up to one in the open. There were considered to be 15 or 16 rhino in the Sanctuary at the time of Lord Minto's shoot.

Arrangements had been made to hold a census during the cold season just over but, on account of men joining the Officers' Reserve, I was given charge of a second Division and had to postpone operations. We do not mean to try and count every rhino in the place, but only the cows with calves. The enumeration will be done by taking very careful measurements of the foot impressions. If, as I hope and believe, we find that there are indisputably as many as 12 cows with calves we can afford to feel confident as to the future of the stock, as there would be a number of immature cows and cows about to calve, but without a calf at foot, not reckoned in our total.

Rhino shooting is now forbidden in Assam except with the Chief Commissioner's permission, but advancing civilisation and more especially the graziers' herds are opposed to any increase of the species outside Reserves. Although the rhino individually is a sturdy and independent beast, yet, as a species, it is easily discouraged and does not appear to thrive, except under conditions where it is not disturbed.

There is every hope of the rhino in the Reserves increasing considerably in numbers. It is a slow breeder and the areas set apart for it are necessarily so confined that I doubt if it ever will get plentiful enough again to become a regular beast of the chase, but we hope that it will so increase as to permit us to catch calves for zoological specimens, either by pitting or in some other way. Considering that a man can sell a dead rhino, horn, skin and flesh, for nearly Rs. 400, poachers are obviously tempted to have a go at them, and rhino shooting and illegal elephant hunting are the only forms of poaching that we have to consider seriously: deer are common enough outside. Rhino, undoubtedly, are occasionally killed in Sanctuaries. In Goalpara raids are sometimes threatened by truculent Nepalese from Bhutan, while those Sanctuaries that have the Brahmaputra as one boundary are obviously very difficult to keep inviolate: in fact, a Conservator a few years ago had to deal with a case where a forest guard had helped to kill a rhino.

The Kamrup Sanctuary is fortunate in its boundaries, and there are not, as yet, any Nepalese across the border in Bhutan. The whole *bundobust* for killing an animal and disposing of the loot has to be so complicated, except in cases where there is access to a foreign country or navigable river, that a number of people must be in it and some one is sure to give it away, even if too late to do any good. The only reported case in Kamrup occurred recently when some right-holders say they found a dead rhino. Investigations are being made to see if it was a case of lead-poisoning. Provided that we are sufficiently generous in rewarding those who supply us with information, there is no reason to fear that this sort of poaching will increase.

There were rumours some years ago that elephants had been caught in the Sanctuary, and a tusker was certainly shot by a party of Bhutanese. In consequence of a complaint made to the Bhutan authorities, soldiers were sent to the offending village and carried off eight out of the ten village muskets, and they evidently played the part of the brutal and licentious soldiery so well that elephant shikar in British territory is no longer considered worth while.

The Game Sanctuary is opened, in its turn, to elephant catching, and Kheddah operations will be allowed during 1917-18 and 1918-19, thereafter remaining closed for eight years. Like all elephants from the north bank of the Brahmaputra, the North Kamrup elephants have a reputation for hardiness, said to be due to the long distances to be travelled between feeding grounds, and the dry nature of the food; South Bank elephants are supposed to be softer on account of the grazing being more plentiful and lush.

The large spectacular Kheddahs, as run by the Mysore Government, and formerly by the Kheddah Department, are not seen here. In them more than one herd may be surrounded and retained by an army of men, while the stockade is run up, but here we build our stockades at the end of the rains, and then, when a herd has been located in the right direction, it is driven up the path on which the stockade has been erected.

In many places in Assam, salt-licks take the form of gigantic amphitheatres carved out of the hillsides and approached by narrow entrances, so that often little more needs to be done than put a gate in position to turn the lick into an economical form of elephant trap. Elephants, naturally, will not allow themselves to be driven into a blind alley like this, but a watch is kept from *macháns*, and the gate is closed on any herd that enters of its own free will.

Elephants seem to be especially fond of visiting the 'poongs' (as the Assamese call salt-licks) in February and March when the weather is hot; the earth has a purgative action. Rhino do not care very much about salt-licks, but all the other herbivora seem to appreciate them. Imperial and green pigeons are attracted in great numbers to a certain salt-lick further east in Darrang district, but it is not known what is the special attraction there. Bright sunshine is apparently necessary to extract the virtue from the earth, as the birds at once leave off pecking at the face of the cliff, if the day clouds over. The Imperial pigeons have a wallow of their own in this 'poong,' a depression filled with whitish mud, in which the birds bathe with great enjoyment.

The same country in the Sanctuary that is good for rhino is also well suited for buffaloes, and 30 years ago vast herds were to be found. Buffaloes are distinctly scarce at present, and the great diminution in their numbers is largely ascribed locally to the form of shikar employed by certain native shooting parties, who used to surround whole herds with elephants and wipe out the lot. It sounds impossible that any one could take delight in such unsavoury slaughter, but I am afraid it is true.

The Assamese believe that tigers prey heavily on buffalo herds but not so much on *nithun* (or bison). Considering the strength and ferocity of the buffalo this might appear to be incredible, but there is probably something in it. Roosevelt in his book on "African Shikar" states it as a well-known fact that lions in some places live by preference on the buffalo herds, so that there is nothing of the impossible about the more powerful tiger doing so in this country.

Not so very long ago a planter told me that when he was out one evening with a friend, they came on a herd of buff and were sitting on their elephants watching them, when suddenly a tiger came charging out of the jungle towards the herd. They each fired two barrels at him but missed, and the buff and tiger ran off. Thinking the *tamasha* was all over, the two spectators were moving off homewards when they heard a considerable disturbance in the jungle, and hastening to the spot they found that the tiger had returned to the attack and had succeeded in killing a buffalo calf. Such boldness can only be explained by supposing that it was a tigress and a very hungry one, but if a tiger can kill, as here, from a herd on the alert, it is reasonable to assume that victims can be obtained from herds off their guard.

Solitary buffalo bulls are found with the tame herds in the grass lands to the south of the Reserve, but unfortunately these are the degenerate creatures kept by the Nepalese, and the services of the wild bulls are of no value to the cows. The mother often dies on account of the calf being too big, or the calf itself, if born alive, frequently only survives a few days. It has now been proposed to exclude the Nepalese buffaloes from this piece



of country and to encourage the Assamese to bring in some of their magnificent animals, which are so nearly related to the wild stock that the breed is improved by crossing with the wild bulls: in fact, such crossing is essential if the breed, which is valuable on account of its superior milking and draught qualities, is to be maintained. Wild calves are still occasionally caught and reared by the Assamese, but increasing cultivation is rapidly removing the opportunities of obtaining wild blood in this way. According to Rowland Ward's "Records of Big Game" three species of buffalo are supposed to have been found in Assam: an extinct race, which was characterised by horns very much horizontally inclined and of great span, the ordinary, and a light-coloured species.

The justification for any such classification is obscure, and it looks as if the extinct race had been described from a few isolated specimens, and the light-coloured race from one solitary skin. Wild buffaloes with horizontally inclined horns, are occasionally killed nowadays, and tame buffaloes with horns of this type occur, while light-coloured domestic buffaloes are so common that it must be possible for such to occur occasionally in the wild state.

If it is safe to judge by the appearance of the domesticated stock, the wild buffalo of Burma must be a different animal from the Assam species. In the Brahmaputra valley tame buffaloes are fairly long-legged, while the horns of both the wild and the tame display a distinct backward trend before sweeping forwards to form the tips: in the Surma valley the so-called Manipuri buffaloes, which really come from Burma through Manipur, are short-legged and very tubby, and the horns do not show any backward inclination at all. A selected pair of Manipuri buffaloes were sent to Calcutta for King George's inspection.

The *mithun* is found nearly everywhere in the Sanctuary, but most commonly along the foot of the Bhutan Hills. The Assamese believe that two *jats* of Mithun exist side by side—the large "Moh-Mithun" and the smaller "Goru-Mithun," but I am absolutely convinced that this is only another case of careless observation on the natives' part. I have never found any one, who could point me out a solitary bull of the small species or a

cow of the big species, and the myth has probably risen from the fact that bulls sometimes considerably exceed in size the average specimen. At any rate, a cow to match the big bull should be produced by those who want us to believe in the two *jats*.

Europeans also have a theory that there are two races living side by side. One with a dew-lap and only slight convexity of the skull between the horn bases, and the other deficient in dew-lap but with a pronounced convexity. The former species is described as being *Bos frontalis*, the origin of the Gayal or tame Mithun, and the latter as the genuine *Bos gaurus*. It is noticeable, however, that observers, as opposed to shikaris pure and simple, do not subscribe to this theory, and Stuart Baker, who went into the question very thoroughly, came to the conclusion that the peculiarities of the Gayal, notably the shape of the head and trend of the horns, were only such as might easily occur as the result of domestication. Wild Mithun, it is true, exhibit considerable differences as regards the presence or absence of a small dew-lap, shape of skull and horns, size of body, etc., but I am quite convinced, from the many opportunities I have had of studying the live animal, that all the different varieties can be found in almost any large herd. The truth is that a young wild bull, 2 or 3 years old, bears a strong resemblance in life to a typical Gayal, and the skull and horns are not dissimilar, but the differences become increasingly accentuated the older the bull. It will nearly always be found that the so-called intermediate wild heads are from youngish animals, which often attain to great bulk of body before their heads are, from a sportsman's point of view, really mature.

The Gayal is at its best in the North Cachar Hills, where wild bulls sometimes consort with the village herds, the individuals of which are larger and less docile than is the case with those living in less favoured hills. The Kukis in Manipur obtain fresh blood for their herds by purchasing bulls from the North Cachar Kukis and Nagas. In one Range in North Cachar it is quite interesting to pass through the Cachari villages, with their fine buffaloes at the foot of the hills, and then ascend to the Kuki and Naga villages with their Mithun herds, the stock in both cases

being kept up to standard by infusions of wild blood. In the Himalayan hills, north of the Brahmaputra, the wild Mithun have been exterminated by the hill tribes, and the village Mithun are consequently small and degenerate. In many cases, too, the colour has run, so to speak, and instead of the typical black bodies with white stockings, piebalds are common. The Bhutan Mithun in the country north of the Sanctuary are apparently ordinary cattle with a distant dash of Gayal blood, which comes out chiefly in the black and piebald colour and the short broad head.

The possession of Mithun is considered a sign of wealth amongst the hill people. They are not milked, but are eaten on State occasions, and are useful for purchasing brides and sacrificing at the funerals of Chiefs. The herds remain untended in the jungle during the day and return to the villages for the night of their own accord, being encouraged to do so by occasionally being given a little salt. Bulls sometimes get a trifle bad-tempered, but this is rare; one's principal objection to the Mithun is that they have a very keen nose for a stranger, and come and blow round the tents all night, if camp is pitched near a village. I was once having dinner near a Kuki village when my servant, a new man, caught sight of a Mithun as it emerged from the forest into the moonlight, just as he was going to hand me a dish; he dropped the dish with a howl and streaked for the cook-house fire, having mistaken the beast for a bear.

Hill tribes are sometimes fined so many Mithun by Government, but difficulty is experienced in disposing of the animals in the plains. They are difficult to keep alive unless free to spend their days in the forest, but planters, who have a little jungle on their estates, will take bulls to run with the coolies' cattle, and these may live a few years.

*Sambhur, Swamp deer, Hog and Barking deer* are all found in the Sanctuary, the Swamp deer being the most plentiful. The Sambhur is the Malayan variety, solitary in habit, with a big body and inferior antlers.

*Pygmy Hog* are not uncommon, and the *ordinary wild pig* exists, to divert to some extent the tigers' attentions from the more

worthy deer. The country being unridable, pig are a pest all over Assam. Guns are licensed to the villagers for the protection of their crops, but it is observed that the Hindus practically never shoot pig, which they are forbidden to eat, but reserve their powder for the deer. It is a fact, however, that deer do very little damage to the crops; they are not attracted much by ripe grain, but have a weakness for the young shoots when the upland rice first sprouts, swamp deer being the worst offenders. Deer are scared at once by a shout, but pigs, which commit havoc once the grain begins to ripen, become fearless at night unless fired at.

It is difficult to understand how Honorable Members of Council have the face to ask for the repeal of the Arms Act on the plea that the ryots' crops are being ruined, because they must know the facts.

Europeans are commonly deceived, because when they are told that "pohu" are destroying crops, they imagine that the allusion is to deer. By "pohu" a European always means a deer, but the Assamese, on the contrary, may mean anything from a porcupine to a Sambhur; the word needs to be qualified. If the complaining villager is asked what sort of "pohu" are doing the damage, he will say, nine times out of ten, that they are "Gahori pohu" or pig. Up-country men are taken in the same way. There was a great hurroosh one day, when the Brahmaputra was in flood, that a "pohu" had been washed ashore on a small wooded island opposite the town. Some Mahomedans joined in the chase and their boat was the first to reach the island, but when they found that the occupant was an angry pig instead of a mild and edible deer they started to revile the people for having said it was a deer.

Tiger and bear (Himalayan, not the sloth) are common, but leopards do not seem to find the wastes of the Reserve so attractive as the village lands elsewhere. There is no doubt that tigers are very plentiful, and permission would be given to shoot them, but it would be a poor place to come to for tiger-shooting.

Beating is absolutely out of the question on account of the thickness and continuity of the cover, while cattle and buffaloes tied up for kills are regarded more as curiosities than anything else by these well-fed tigers. There is no doubt that tigers kill

occasional rhino calves when the mother is not at hand, and also regard baby elephants as legitimate prey. In the case of the latter the tiger's aim seems to be to rush in and kill a calf, and bolt before it can be caught, as it well knows that the mother will after a time leave the dead body. I have seen an elephant that had a chronic sore back, where it had been mauled by a tiger in its young days, and knew an elephant that was found standing in the forest by her dead calf, so lacerated and weary from a struggle with a tiger, that she was unable to get away and avoid capture.

*Hyaenas* and *wolves* do not occur in Assam but the ubiquitous *wild dog* is a resident. It is commonly asserted that there is a big race that goes about in small packs of half-a-dozen or so, and a small race that travels in large packs. It is, also, equally commonly said that the game may be blinded by the dogs micturating on bushes, lining the paths along which it is intended to drive the prey.

The proof or disproof of either of these theories would be difficult.

It has been suggested that the large packs appear to be made up of a small *jat* of dog because of the number of half-grown pups running with the packs, and that what are mistaken for a big *jat* are really a few mature animals that have separated from the main pack at the commencement of the breeding season.

The failure on the part of hunted deer to avoid rocks and other obstacles in their path is ascribed by some to the fact that the deer have run themselves to such a condition of numbness that they are incapable of noticing anything, but I once had a young Sambhur brought to me alive by some villagers, who said that the mother had been blinded by wild dogs and that they had caught her too, but she was too powerful for them to hold. There was, of course, no proof that she had been blinded by wild dogs, but the villagers seemed to regard it as the obvious explanation.

The wild dog has not become the pest in Assam that it is in other provinces, and I have noticed that the species most distinctly prefers the hills to the plains. I do not know if this has been observed elsewhere. Packs make periodical swoops down into the

plains, but they certainly seem to spend most of their time in the hills, even if there is less game there.

It was thought at first that a Game Sanctuary, from which European sportsmen would be excluded, would end by being nothing but a preserve for the tiger, wild dog and native poacher. Time has shown that this is not the case. So far as the tigers and wild dog are concerned, there must always be the balance, imposed by nature, between the hunters and the hunted, while the amount of poaching, detected or suspected, is not alarming. Complete immunity cannot be hoped for, and even in England, where comparatively small estates are protected by dogs and numbers of trained keepers, raids occasionally take place.

The Assam Sanctuaries will come into their own in the days, not so distant now, when communications will have improved, but opportunities for observing the habits of big game have decreased. All over the world the rifle is giving place to the camera as the stalker's weapon, and we are now waiting to welcome the photographer to our Sanctuaries.

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#### A NOTE ON PRECAUTIONS WHICH CAN BE TAKEN WHEN TIGER-SHOOTING IN THE CENTRAL PROVINCES.

BY A. A. DUNBAR-BRANDER, I.F.S.

1. The following remarks are not intended for the experienced shikari, who presumably knows what he is about and pursues his game with a tested confidence in his own abilities and a knowledge of the habits of the game he pursues. It is unnecessary, therefore, to discuss the precautions to be taken in which an unwounded tiger is deliberately followed up on foot with the intention of shooting it. Either the shikari possesses the necessary experience or he does not, but in either case his action presupposes a self-confidence that makes any remarks on the subject superfluous.

The recent and lamentable death of Mr. Bell, I.C.S., the result of following up a wounded tiger under circumstances in which the exercise of certain precautions would probably have prevented the accident, makes the present moment an appropriate one for