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A Hunter-Naturalist in the Brazilian Wilderness

Up the River of Tapirs

AFTER leaving Cáceres we went up the Sepotuba, which in the local Indian dialect means River of Tapirs. This river is only navigable for boats of size when the water is high. It is a swift, fairly clear stream, rushing down from the Plan Alto, the high uplands, through the tropical lowland forest. On the right hand, or western bank, and here and there on the left bank, the forest is broken by natural pastures and meadows, and at one of these places, known as Porto Campo, sixty or seventy miles above the mouth, there is a good-sized cattle-ranch. Here we halted, because the launch, and the two pranchas—native trading-boats with houses on their decks—which it towed, could not carry our entire party and outfit. Accordingly most of the baggage and some of the party were sent ahead to where we were to meet our pack-train, at Tapirapoan. Meanwhile the rest of us made our first camp under tents at Porto Campo, to wait the return of the boats. The tents were placed in a line, with the tent of Colonel Rondon and the tent in which Kermit and I slept, in the middle, beside one another. In front of these two, on tall poles, stood the Brazilian and American flags; and at sunrise and sunset the flags were hoisted and hauled down while the trumpet sounded and all of us stood at attention. Camp was pitched beside the ranch buildings. In the trees near the tents grew wonderful violet orchids.

Many birds were around us; I saw some of them, and Cherrie and Miller many, many more. They ranged from party-colored macaws, green parrots, and big gregarious cuckoos down to a brilliant green-and-chestnut kingfisher, five and a quarter inches long, and a tiny orange-and-green manakin, smaller than any bird I have ever seen except a hummer. We also saw a bird that really was protectively colored; a kind of whippoorwill which even the sharp-eyed naturalists could only make out because it moved its head. We saw orange-bellied squirrels with showy orange tails. Lizards were common. We killed our first poisonous snake (the second we had seen), an evil lance-headed jararaca that was swimming the river. We also saw a black-and-orange harmless snake, nearly eight feet long, which we were told was akin to the mussurama; and various other snakes. One day while paddling in a canoe on the river, hoping that the dogs might drive a tapir to us, they drove into the water a couple of small bush deer instead. There was no point in shooting them; we caught them with ropes thrown over their heads; for the naturalists needed them as specimens, and all of us needed the meat. One of the men was stung by a single big red maribundi wasp. For twenty-four hours he was in great pain and incapacitated for work. In a lagoon two of the dogs had the tips of their tails bitten off by piranhas as they swam, and the ranch hands told us that in this lagoon one of their hounds had been torn to pieces and completely devoured by the ravenous fish. It was a further illustration of the uncertainty of temper and behavior of these ferocious little monsters. In other lagoons they had again and again

left us and our dogs unmolested. They vary locally in aggressiveness just as sharks and crocodiles in different seas and rivers vary.

On the morning of January 9th we started out for a tapir-hunt. Tapirs are hunted with canoes, as they dwell in thick jungle and take to the water when hounds follow them. In this region there were extensive papyrus-swamps and big lagoons, back from the river, and often the tapirs fled to these for refuge, throwing off the hounds. In these places it was exceedingly difficult to get them; our best chance was to keep to the river in canoes, and paddle toward the spot in the direction of which the hounds, by the noise, seemed to be heading. We started in four canoes. Three of them were Indian dugouts, very low in the water. The fourth was our Canadian canoe, a beauty; light, safe, roomy, made of thin slats of wood and cement-covered canvas. Colonel Rondon, Fiala with his camera, and I went in this canoe, together with two paddlers. The paddlers were natives of the poorer class. They were good men. The bowsman was of nearly pure white blood; the steersman was of nearly pure negro blood, and was evidently the stronger character and better man of the two. The other canoes carried a couple of fazendeiros, ranchmen, who had come up from Cáceres with their dogs. These dugouts were manned by Indian and half-caste paddlers, and the fazendeiros, who were of nearly pure white blood, also at times paddled vigorously. All were dressed in substantially similar clothes, the difference being that those of the camaradas, the poorer men or laborers, were in tatters. In the canoes no man wore anything save a shirt, trousers, and hat, the feet being bare. On horseback they wore long leather leggings which were really simply high, rather flexible boots with the soles off; their spurs were on their tough bare feet. There was every gradation between and among the nearly pure whites, negroes, and Indians. On the whole, there was most white blood in the upper ranks, and most Indian and negro blood among the camaradas; but there were exceptions in both classes, and there was no discrimination on account of color. All alike were courteous and friendly.

The hounds were at first carried in two of the dugouts, and then let loose on the banks. We went up-stream for a couple of hours against the swift current, the paddlers making good headway with their pointed paddles—the broad blade of each paddle was tipped with a long point, so that it could be thrust into the mud to keep the low dugout against the bank. The tropical forest came down almost like a wall, the tall trees laced together with vines, and the spaces between their trunks filled with a low, dense jungle. In most places it could only be penetrated by a man with a machete. With few exceptions the trees were unknown to me, and their native names told me nothing. On most of them the foliage was thick; among the exceptions were the cecropias, growing by preference on new-formed alluvial soil bare of other trees, whose rather scanty leaf bunches were, as I was informed, the favorite food of sloths. We saw one or two squirrels among the trees, and a family of monkeys. There were few sand-banks in the river, and no water-fowl save an occasional cormorant. But as we pushed along near the shore, where the branches overhung and dipped in the swirling water, we continually roused little flocks of bats. They were hanging from the boughs right over the river, and when our approach roused them they zigzagged rapidly in front of us for a few rods, and then again dove in among the branches.

At last we landed at a point of ground where there was little jungle, and where the forest was composed of palms and was fairly open. It was a lovely bit of forest. The colonel strolled off in one direction, returning an hour later with a squirrel for the naturalists. Meanwhile Fiala and I went through the palm wood to a papyrus-swamp. Many trails led through the woods, and especially along the borders of the swamp; and, although their principal makers had evidently been cattle, yet there were in them footprints of both tapir and deer. The tapir makes a footprint

much like that of a small rhinoceros, being one of the odd-toed ungulates. We could hear the dogs now and then, evidently scattered and running on various trails. They were a worthless lot of cur-hounds. They would chase tapir or deer or anything else that ran away from them as long as the trail was easy to follow; but they were not stanch, even after animals that fled, and they would have nothing whatever to do with animals that were formidable.

While standing by the marsh we heard something coming along one of the game paths. In a moment a buck of the bigger species of bush deer appeared, a very pretty and graceful creature. It stopped and darted back as soon as it saw us, giving us no chance for a shot; but in another moment we caught glimpses of it running by at full speed, back among the palms. I covered an opening between two tree-trunks. By good luck the buck appeared in the right place, giving me just time to hold well ahead of him and fire. At the report he went down in a heap, the "umbrella-pointed" bullet going in at one shoulder, and ranging forward, breaking the neck. The leaden portion of the bullet, in the proper mushroom or umbrella shape, stopped under the neck skin on the farther side. It is a very effective bullet.

Miller particularly wished specimens of these various species of bush deer, because their mutual relationships have not yet been satisfactorily worked out. This was an old buck. The antlers were single spikes, five or six inches long; they were old and white and would soon have been shed. In the stomach were the remains of both leaves and grasses, but especially the former; the buck was both a browser and grazer. There were also seeds, but no berries or nuts such as I have sometimes found in deers' stomachs. This species, which is abundant in this neighborhood, is solitary in its habits, not going in herds. At this time the rut was past, the bucks no longer sought the does, the fawns had not been born, and the yearlings had left their mothers; so that each animal usually went by itself. When chased they were very apt to take to the water. This instinct of taking to the water, by the way, is quite explicable as regards both deer and tapir, for it affords them refuge against their present day natural foes, but it is a little puzzling to see the jaguar readily climbing trees to escape dogs; for ages have passed since there were in its habitat any natural foes from which it needed to seek safety in trees. But it is possible that the habit has been kept alive by its seeking refuge in them on occasion from the big peccaries, which are among the beasts on which it ordinarily preys.

We hung the buck in a tree. The colonel returned, and not long afterward one of the paddlers who had been watching the river called out to us that there was a tapir in the water, a good distance up-stream, and that two of the other boats were after it. We jumped into the canoe and the two paddlers dug their blades in the water as they drove her against the strong current, edging over for the opposite bank. The tapir was coming down-stream at a great rate, only its queer head above water, while the dugouts were closing rapidly on it, the paddlers uttering loud cries. As the tapir turned slightly to one side or the other the long, slightly upturned snout and the strongly pronounced arch of the crest along the head and upper neck gave it a marked and unusual aspect. I could not shoot, for it was directly in line with one of the pursuing dugouts. Suddenly it dived, the snout being slightly curved downward as it did so. There was no trace of it; we gazed eagerly in all directions; the dugout in front came alongside our canoe and the paddlers rested, their paddles ready. Then we made out the tapir clambering up the bank. It had dived at right angles to the course it was following and swum under water to the very edge of the shore, rising under the overhanging tree-branches at a point where a drinking-trail for game led down a break in the bank. The branches partially hid it, and it was in deep shadow, so that it did not offer a very good shot. My bullet went into its body too far back, and the tapir disappeared in the forest at a gallop as if un-hurt, although the bullet really secured it, by making it unwilling to

trust to its speed and leave the neighborhood of the water. Three or four of the hounds were by this time swimming the river, leaving the others yelling on the opposite side; and as soon as the swimmers reached the shore they were put on the tapir's trail and galloped after it, giving tongue. In a couple of minutes we saw the tapir take to the water far up-stream, and after it we went as fast as the paddles could urge us through the water. We were not in time to head it, but fortunately some of the dogs had come down to the river's edge at the very point where the tapir was about to land, and turned it back. Two or three of the dogs were swimming. We were more than half the breadth of the river away from the tapir, and somewhat down-stream, when it dived. It made an astonishingly long swim beneath the water this time, almost as if it had been a hippopotamus, for it passed completely under our canoe and rose between us and the hither bank. I shot it, the bullet going into its brain, while it was thirty or forty yards from shore. It sank at once.

There was now nothing to do but wait until the body floated. I feared that the strong current would roll it down-stream over the river bed, but my companions assured me that this was not so, and that the body would remain where it was until it rose, which would be in an hour or two. They were right, except as to the time. For over a couple of hours we paddled, or anchored ourselves by clutching branches close to the spot, or else drifted down a mile and paddled up again near the shore, to see if the body had caught anywhere. Then we crossed the river and had lunch at the lovely natural picnic-ground where the buck was hung up. We had very nearly given up the tapir when it suddenly floated only a few rods from where it had sunk. With no little difficulty the big, round black body was hoisted into the canoe, and we all turned our prows down-stream. The skies had been lowering for some time, and now—too late to interfere with the hunt or cause us any annoyance—a heavy downpour of rain came on and beat upon us. Little we cared, as the canoe raced forward, with the tapir and the buck lying in the bottom, and a dry, comfortable camp ahead of us.

When we reached camp, and Father Zahm saw the tapir, he reminded me of something I had completely forgotten. When, some six years previously, he had spoken to me in the White House about taking this South American trip, I had answered that I could not, as I intended to go to Africa, but added that I hoped some day to go to South America and that if I did so I should try to shoot both a jaguar and a tapir, as they were the characteristic big-game animals of the country. "Well," said Father Zahm, "now you've shot them both!" The storm continued heavy until after sunset. Then the rain stopped and the full moon broke through the cloud-rack. Father Zahm and I walked up and down in the moonlight, talking of many things, from Dante, and our own plans for the future, to the deeds and the wanderings of the old time Spanish conquistadores in their search for the Gilded King, and of the Portuguese adventurers who then divided with them the mastery of the oceans and of the unknown continents beyond.

This was an attractive and interesting camp in more ways than one. The vaqueiros with their wives and families were housed on the two sides of the field in which our tents were pitched. On one side was a big, whitewashed, tile-roofed house in which the foreman dwelt—an olive-skinned, slightly built, wiry man, with an olive-skinned wife and eight as pretty, fair-haired children as one could wish to see. He usually went barefoot, and his manners were not merely good but distinguished. Corrals and outbuildings were near this big house. On the opposite side of the field stood the row of steep-roofed, palm-thatched huts in which the ordinary cowhands lived with their dusky helpmeets and children. Each night from these palm-thatched quarters we heard the faint sounds of a music that went far back of civilization to a savage ancestry near by in point of time and otherwise immeasurably remote; for through the still, hot air, under the

brilliant moonlight, we heard the monotonous throbbing of a tom-tom drum, and the twanging of some old stringed instrument. The small black turkey-buzzards, here always called crows, were as tame as chickens near the big house, walking on the ground or perched in the trees beside the corral, waiting for the offal of the slaughtered cattle. Two palm-trees near our tent were crowded with the long, hanging nests of one of the cacique orioles. We lived well, with plenty of tapir beef, which was good, and venison of the bush deer, which was excellent; and as much ordinary beef as we wished, and fresh milk, too—a rarity in this country. There were very few mosquitoes, and everything was as comfortable as possible.

The tapir I killed was a big one. I did not wish to kill another, unless, of course, it became advisable to do so for food; whereas I did wish to get some specimens of the big, white-lipped peccary, the “queixa” (pronounced “cashada”) of the Brazilians, which would make our collection of the big mammals of the Brazilian forests almost complete. The remaining members of the party killed two or three more tapirs. One was a bull, full grown but very much smaller than the animal I had killed. The hunters said that this was a distinct kind. The skull and skin were sent back with the other specimens to the American Museum, where after due examination and comparison its specific identify will be established. Tapirs are solitary beasts. Two are rarely found together, except in the case of a cow and its spotted and streaked calf. They live in dense cover, usually lying down in the daytime and at night coming out to feed, and going to the river or to some lagoon to bathe and swim. From this camp Sigg took Lieutenant Lyra back to Cáceres to get something that had been overlooked. They went in a rowboat to which the motor had been attached, and at night on the way back almost ran over a tapir that was swimming. But in unfrequented places tapirs both feed and bathe during the day. The stomach of the one I shot contained big palm-nuts; they had been swallowed without enough mastication to break the kernel, the outer pulp being what the tapir prized. Tapirs gallop well, and their tough hide and wedge shape enable them to go at speed through very dense cover. They try to stamp on, and even to bite, a foe, but are only clumsy fighters.

The tapir is a very archaic type of ungulate, not unlike the non-specialized beasts of the oligocene. From some such ancestral type the highly specialized one-toed modern horse has evolved, while during the uncounted ages that saw the horse thus develop the tapir has continued substantially unchanged. Originally the tapirs dwelt in the northern hemisphere, but there they gradually died out, the more specialized horse, and even for long ages the rhinoceros, persisting after they had vanished; and nowadays the surviving tapirs are found in Malaysia and South America, far from their original home. The relations of the horse and tapir in the paleontological history of South America are very curious. Both were, geologically speaking, comparatively recent immigrants, and if they came at different dates it is almost certain that the horse came later. The horse for an age or two, certainly for many hundreds of thousands of years, thrived greatly and developed not only several different species but even different genera. It was much the most highly specialized of the two, and in the other continental regions where both were found the horse outlasted the tapir. But in South America the tapir outlasted the horse. From unknown causes the various genera and species of horses died out, while the tapir has persisted. The highly specialized, highly developed beasts, which represented such a full evolutionary development, died out, while their less specialized remote kinsfolk, which had not developed, clung to life and thrived; and this although the direct reverse was occurring in North America and in the Old World. It is one of the innumerable and at present insoluble problems in the history of life on our planet.

I spent a couple of days of hard work in getting the big white-lipped peccaries—white-lipped being rather a misnomer, as the entire under jaw and lower cheek are white. They were said to be found on the other side of, and some distance back from, the river. Colonel Rondon had sent out one of our attendants, an old follower of his, a full-blood Parecís Indian, to look for tracks. This was an excellent man, who dressed and behaved just like the other good men we had, and was called Antonio Parecís. He found the tracks of a herd of thirty or forty cashadas, and the following morning we started after them.

On the first day we killed nothing. We were rather too large a party, for one or two of the visiting fazendeiros came along with their dogs. I doubt whether these men very much wished to overtake our game, for the big peccary is a murderous foe of dogs (and is sometimes dangerous to men). One of their number frankly refused to come or to let his dogs come, explaining that the fierce wild swine were “very badly brought up” (a literal translation of his words) and that respectable dogs and men ought not to go near them. The other fazendeiros merely feared for their dogs; a groundless fear, I believe, as I do not think that the dogs could by any exertion have been dragged into dangerous proximity with such foes. The ranch foreman, Benedetto, came with us, and two or three other camaradas, including Antonio, the Parecís Indian. The horses were swum across the river, each being led beside a dugout. Then we crossed with the dogs; our horses were saddled, and we started.

It was a picturesque cavalcade. The native hunters, of every shade from white to dark copper, all wore leather leggings that left the soles of their feet bare, and on their bare heels wore spurs with wheels four inches across. They went in single file, for no other mode of travel was possible; and the two or three leading men kept their machetes out, and had to cut every yard of our way while we were in the forest. The hunters rode little stallions, and their hounds were gelded.

Most of the time we were in forest or swampy jungle. Part of the time we crossed or skirted marshy plains. In one of them a herd of half-wild cattle was feeding. Herons, storks, ducks, and ibises were in these marshes, and we saw one flock of lovely roseate spoonbills.

In one grove the fig-trees were killing the palms, just as in Africa they kill the sandalwood-trees. In the gloom of this grove there were no flowers, no bushes; the air was heavy; the ground was brown with mouldering leaves. Almost every palm was serving as a prop for a fig-tree. The fig-trees were in every stage of growth. The youngest ones merely ran up the palms as vines. In the next stage the vine had thickened and was sending out shoots, wrapping the palm stem in a deadly hold. Some of the shoots were thrown round the stem like the tentacles of an immense cuttlefish. Others looked like claws, that were hooked into every crevice, and round every projection. In the stage beyond this the palm had been killed, and its dead carcass appeared between the big, winding vine-trunks; and later the palm had disappeared and the vines had united into a great fig-tree. Water stood in black pools at the foot of the murdered trees, and of the trees that had murdered them. There was something sinister and evil in the dark stillness of the grove; it seemed as if sentient beings had writhed themselves round and were strangling other sentient beings.

We passed through wonderfully beautiful woods of tall palms, the ouaouaça palm—wawasa palm, as it should be spelled in English. The trunks rose tall and strong and slender, and the fronds were branches twenty or thirty feet long, with the many long, narrow green blades starting from the midrib at right angles in pairs. Round the ponds stood stately burity palms, rising like huge columns, with great branches that looked like fans, as the long, stiff blades

radiated from the end of the midrib. One tree was gorgeous with the brilliant hues of a flock of party-colored macaws. Green parrots flew shrieking overhead.

Now and then we were bitten and stung by the venomous fire-ants, and ticks crawled upon us. Once we were assailed by more serious foes, in the shape of a nest of maribundi wasps, not the biggest kind, but about the size of our hornets. We were at the time passing through dense jungle, under tall trees, in a spot where the down timber, holes, tangled creepers, and thorns made the going difficult. The leading men were not assailed, although they were now and then cutting the trail. Colonel Rondon and I were in the middle of the column, and the swarm attacked us; both of us were badly stung on the face, neck, and hands, the colonel even more severely than I was. He wheeled and rode to the rear and I to the front; our horses were stung too; and we went at a rate that a moment previously I would have deemed impossible over such ground.

At the close of the day, when we were almost back at the river, the dogs killed a jaguar kitten. There was no trace of the mother. Some accident must have befallen her, and the kitten was trying to shift for herself. She was very emaciated. In her stomach were the remains of a pigeon and some tendons from the skeleton or dried carcass of some big animal. The loathsome berni flies, which deposit eggs in living beings—cattle, dogs, monkeys, rodents, men—had been at it. There were seven huge, white grubs making big abscess-like swellings over its eyes. These flies deposit their grubs in men. In 1909, on Colonel Rondon's hardest trip, every man of the party had from one to five grubs deposited in him, the fly acting with great speed, and driving its ovipositor through clothing. The grubs cause torture; but a couple of cross cuts with a lancet permit the loathsome creatures to be squeezed out.

In these forests the multitude of insects that bite, sting, devour, and prey upon other creatures, often with accompaniments of atrocious suffering, passes belief. The very pathetic myth of "beneficent nature" could not deceive even the least wise being if he once saw for himself the iron cruelty of life in the tropics. Of course "nature"—in common parlance a wholly inaccurate term, by the way, especially when used as if to express a single entity—is entirely ruthless, no less so as regards types than as regards individuals, and entirely indifferent to good or evil, and works out her ends or no ends with utter disregard of pain and woe.

The following morning at sunrise we started again. This time only Colonel Rondon and I went with Benedetto and Antonio the Indian. We brought along four dogs which it was fondly hoped might chase the cashadas. Two of them disappeared on the track of a tapir and we saw them no more; one of the others promptly fled when we came across the tracks of our game, and would not even venture after them in our company; the remaining one did not actually run away and occasionally gave tongue, but could not be persuaded to advance unless there was a man ahead of him. However, Colonel Rondon, Benedetto, and Antonio formed a trio of hunters who could do fairly well without dogs.

After four hours of riding, Benedetto, who was in the lead, suddenly stopped and pointed downward. We were riding along a grassy interval between masses of forest, and he had found the fresh track of a herd of big peccaries crossing from left to right. There were apparently thirty or forty in the herd. The small peccaries go singly or in small parties, and when chased take refuge in holes or hollow logs, where they show valiant fight; but the big peccaries go in herds of considerable size, and are so truculent that they are reluctant to run, and prefer either to move slowly off chattering their tusks and grunting, or else actually to charge. Where much persecuted the survivors gradually grow more willing to run, but their instinct is not to run but to trust to their truculence and their mass-action for safety. They inflict a fearful bite and frequently kill dogs. They often charge the hunters and I have heard of men being badly wounded by them,

while almost every man who hunts them often is occasionally forced to scramble up a tree to avoid a charge. But I have never heard of a man being killed by them. They sometimes surround the tree in which the man has taken refuge and keep him up it. Cherrie, on one occasion in Costa Rica, was thus kept up a tree for several hours by a great herd of three or four hundred of these peccaries; and this although he killed several of them. Ordinarily, however, after making their charge they do not turn, but pass on out of sight. Their great foe is the jaguar, but unless he exercises much caution they will turn the tables on him. Cherrie, also in Costa Rica, came on the body of a jaguar which had evidently been killed by a herd of peccaries some twenty-four hours previously. The ground was trampled up by their hoofs, and the carcass was rent and slit into pieces.

Benedetto, as soon as we discovered the tracks, slipped off his horse, changed his leggings for sandals, threw his rifle over his arm, and took the trail of the herd, followed by the only dog which would accompany him. The peccaries had gone into a broad belt of forest, with a marsh on the farther side. At first Antonio led the colonel and me, all of us on horseback, at a canter round this belt to the marsh side, thinking the peccaries had gone almost through it. But we could hear nothing. The dog only occasionally barked, and then not loudly. Finally we heard a shot. Benedetto had found the herd, which showed no fear of him; he had backed out and fired a signal shot. We all three went into the forest on foot toward where the shot had been fired. It was dense jungle and stiflingly hot. We could not see clearly for more than a few feet, or move easily without free use of the machetes. Soon we heard the ominous groaning of the herd, in front of us, and almost on each side. Then Benedetto joined us, and the dog appeared in the rear. We moved slowly forward, toward the sound of the fierce moaning grunts which were varied at times by a castanet chattering of the tusks. Then we dimly made out the dark forms of the peccaries moving very slowly to the left. My companions each chose a tree to climb at need and pointed out one for me. I fired at the half-seen form of a hog, through the vines, leaves, and branches; the colonel fired; I fired three more shots at other hogs; and the Indian also fired. The peccaries did not charge; walking and trotting, with bristles erect, groaning and clacking their tusks, they disappeared into the jungle. We could not see one of them clearly; and not one was left dead. But a few paces on we came across one of my wounded ones, standing at bay by a palm trunk; and I killed it forthwith. The dog would not even trail the wounded ones; but here Antonio came to the front. With eyes almost as quick and sure as those of a wild beast he had watched after every shot, and was able to tell the results in each case. He said that in addition to the one I had just killed I had wounded two others so seriously that he did not think they would go far, and that Colonel Rondon and he himself had each badly wounded one; and, moreover, he showed the trails each wounded animal had taken. The event justified him. In a few minutes we found my second one dead. Then we found Antonio's. Then we found my third one alive and at bay, and I killed it with another bullet. Finally we found the colonel's. I told him I should ask the authorities of the American museum to mount his and one or two of mine in a group, to commemorate our hunting together.

If we had not used crippling rifles the peccaries might have gotten away, for in the dark jungle, with the masses of intervening leaves and branches, it was impossible to be sure of placing each bullet properly in the half-seen moving beast. We found where the herd had wallowed in the mud. The stomachs of the peccaries we killed contained wild figs, palm nuts, and bundles of root fibres. The dead beasts were covered with ticks. They were at least twice the weight of the smaller peccaries.

On the ride home we saw a buck of the small species of bush deer, not half the size of the kind I had already shot. It was only a patch of red in the bush, a good distance off, but I was lucky enough to hit it. In spite of its small size it was a full-grown male, of a species we had not yet obtained. The antlers had recently been shed, and the new antler growth had just begun. A great jabiru stork let us ride by him a hundred and fifty yards off without thinking it worth while to take flight. This day we saw many of the beautiful violet orchids; and in the swamps were multitudes of flowers, red, yellow, lilac, of which I did not know the names.

I alluded above to the queer custom these people in the interior of Brazil have of gelding their hunting-dogs. This absurd habit is doubtless the chief reason why there are so few hounds worth their salt in the more serious kinds of hunting, where the quarry is the jaguar or big peccary. Thus far we had seen but one dog as good as the ordinary cougar hound or bear hound in such packs as those with which I had hunted in the Rockies and in the cane-brakes of the lower Mississippi. It can hardly be otherwise when every dog that shows himself worth anything is promptly put out of the category of breeders—the theory apparently being that the dog will then last longer. All the breeding is from worthless dogs, and no dog of proved worth leaves descendants.

The country along this river is a fine natural cattle country, and some day it will surely see a great development. It was opened to development by Colonel Rondon only five or six years ago. Already an occasional cattle ranch is to be found along the banks. When railroads are built into these interior portions of Matto Grosso the whole region will grow and thrive amazingly—and so will the railroads. The growth will not be merely material. An immense amount will be done in education; using the word education in its broadest and most accurate sense, as applying to both mind and spirit, to both the child and the man. Colonel Rondon is not merely an explorer. He has been and is now a leader in the movement for the vital betterment of his people, the people of Matto Grosso. The poorer people of the back country everywhere suffer because of the harsh and improper laws of debt. In practice these laws have resulted in establishing a system of peonage, such as has grown up here and there in our own nation. A radical change is needed in this matter; and the colonel is fighting for the change. In school matters the colonel has precisely the ideas of our wisest and most advanced men and women in the United States. Cherrie—who is not only an exceedingly efficient naturalist and explorer in the tropics, but is also a thoroughly good citizen at home—is the chairman of the school board of the town of Newfane, in Vermont. He and the colonel, and Kermit and I, talked over school matters at length, and were in hearty accord as to the vital educational needs of both Brazil and the United States: the need of combining industrial with purely mental training, and the need of having the wide-spread popular education, which is and must be supported and paid for by the government, made a purely governmental and absolutely nonsectarian function, administered by the state alone, without interference with, nor furtherance of, the beliefs of any reputable church. The colonel is also head of the Indian service of Brazil, being what corresponds roughly with our commissioner of Indian affairs. Here also he is taking the exact view that is taken in the United States by the staunchest and wisest friends of the Indians. The Indians must be treated with intelligent and sympathetic understanding, no less than with justice and firmness; and until they become citizens, absorbed into the general body politic, they must be the wards of the nation, and not of any private association, lay or clerical, no matter how well-meaning.

The Sepotuba River was scientifically explored and mapped for the first time by Colonel Rondon in 1908, as head of the Brazilian Telegraphic Commission. This was during the second year of his exploration and opening of the unknown northwestern wilderness of Matto Grosso.

Most of this wilderness had never previously been trodden by the foot of a civilized man. Not only were careful maps made and much other scientific work accomplished, but posts were established and telegraph-lines constructed. When Colonel Rondon began the work he was a major. He was given two promotions, to lieutenant-colonel and colonel, while absent in the wilderness. His longest and most important exploring trip, and the one fraught with most danger and hardship, was begun by him in 1909, on May 3d, the anniversary of the discovery of Brazil. He left Tapirapoan on that day, and he reached the Madeira River on Christmas, December 25, of the same year, having descended the Gy-Paraná. The mouth of this river had long been known, but its upper course for half its length was absolutely unknown when Rondon descended it. Among those who took part under him in this piece of exploration were the present Captain Amilcar and Lieutenant Lyra; and two better or more efficient men for such wilderness work it would be impossible to find. They acted as his two chief assistants on our trip. In 1909 the party exhausted all their food, including even the salt, by August. For the last four months they lived exclusively on the game they killed, on fruits, and on wild honey. Their equipage was what the men could carry on their backs. By the time the party reached the Madeira they were worn out by fatigue, exposure, and semi-starvation, and their enfeebled bodies were racked by fever.

The work of exploration accomplished by Colonel Rondon and his associates during these years was as remarkable as, and in its results even more important than, any similar work undertaken elsewhere on the globe at or about the same time. Its value was recognized in Brazil. It received no recognition by the geographical societies of Europe or the United States.

The work done by the original explorers of such a wilderness necessitates the undergoing of untold hardship and danger. Their successors, even their immediate successors, have a relatively easy time. Soon the road becomes so well beaten that it can be traversed without hardship by any man who does not venture from it—although if he goes off into the wilderness for even a day, hunting or collecting, he will have a slight taste of what his predecessors endured. The wilderness explored by Colonel Rondon is not yet wholly subdued, and still holds menace to human life. At Cáceres he received notice of the death of one of his gallant subordinates, Captain Cardozo. He died from beriberi, far out in the wilderness along our proposed line of march. Colonel Rondon also received news that a boat ascending the Gy-Paraná, to carry provisions to meet those of our party who were to descend that stream, had been upset, the provisions lost, and three men drowned. The risk and hardship are such that the ordinary men, the camaradas, do not like to go into the wilderness. The men who go with the Telegraphic Commission on the rougher and wilder work are paid seven times as much as they earn in civilization. On this trip of ours Colonel Rondon met with much difficulty in securing some one who could cook. He asked the cook on the little steamer Nyoac to go with us; but the cook with unaffected horror responded: “Senhor, I have never done anything to deserve punishment!”

Five days after leaving us, the launch, with one of the native trading-boats lashed alongside, returned. On the 13th we broke camp, loaded ourselves and all our belongings on the launch and the house-boat, and started upstream for Tapirapoan. All told there were about thirty men, with five dogs and tents, bedding and provisions; fresh beef, growing rapidly less fresh; skins—all and everything jammed together.

It rained most of the first day and part of the first night. After that the weather was generally overcast and pleasant for travelling; but sometimes rain and torrid sunshine alternated. The cooking—and it was good cooking—was done at a funny little open-air fireplace, with two or three cooking-pots placed at the stern of the house-boat.

The fireplace was a platform of earth, taken from anthills, and heaped and spread on the boards of the boat. Around it the dusky cook worked with philosophic solemnity in rain and shine. Our attendants, friendly souls with skins of every shade and hue, slept most of the time, curled up among boxes, bundles, and slabs of beef. An enormous land turtle was tethered toward the bow of the house-boat. When the men slept too near it, it made futile efforts to scramble over them; and in return now and then one of them gravely used it for a seat.

Slowly the throbbing engine drove the launch and its unwieldy side-partner against the swift current. The river had risen. We made about a mile and a half an hour. Ahead of us the brown water street stretched in curves between endless walls of dense tropical forest. It was like passing through a gigantic greenhouse. Wawasa and burity palms, cecropias, huge figs, feathery bamboos, strange yellow-stemmed trees, low trees with enormous leaves, tall trees with foliage as delicate as lace, trees with buttressed trunks, trees with boles rising smooth and straight to lofty heights, all woven together by a tangle of vines, crowded down to the edge of the river. Their drooping branches hung down to the water, forming a screen through which it was impossible to see the bank, and exceedingly difficult to penetrate to the bank. Rarely one of them showed flowers—large white blossoms, or small red or yellow blossoms. More often the lilac flowers of the begonia-vine made large patches of color. Innumerable epiphytes covered the limbs, and even grew on the roughened trunks. We saw little bird life—a darter now and then, and kingfishers flitting from perch to perch. At long intervals we passed a ranch. At one the large, red-tiled, whitewashed house stood on a grassy slope behind mango-trees. The wooden shutters were thrown back from the unglazed windows, and the big rooms were utterly bare—not a book, not an ornament. A palm, loaded with scores of the pendulous nests of the troupials, stood near the door. Behind were orange-trees and coffee-plants, and near by fields of bananas, rice, and tobacco. The sallow foreman was courteous and hospitable. His dark-skinned women-folk kept in the furtive background. Like most of the ranches, it was owned by a company with headquarters at Cáceres.

The trip was pleasant and interesting, although there was not much to do on the boat. It was too crowded to move around save with a definite purpose. We enjoyed the scenery; we talked—in English, Portuguese, bad French, and broken German. Some of us wrote. Fiala made sketches of improved tents, hammocks, and other field equipment, suggested by what he had already seen. Some of us read books. Colonel Rondon, neat, trim, alert, and soldierly, studied a standard work on applied geographical astronomy. Father Zahm read a novel by Fogazzaro. Kermit read Camoens and a couple of Brazilian novels, “O Guarani” and “Innocencia.” My own reading varied from “Quentin Durward” and Gibbon to the “Chanson de Roland.” Miller took out his little pet owl Moses, from the basket in which Moses dwelt, and gave him food and water. Moses crooned and chuckled gratefully when he was stroked and tickled.

Late the first evening we moored to the bank by a little fazenda of the poorer type. The houses were of palm-leaves. Even the walls were made of the huge fronds or leafy branches of the wawasa palm, stuck upright in the ground and the blades plaited together. Some of us went ashore. Some stayed on the boats. There were no mosquitoes, the weather was not oppressively hot, and we slept well. By five o'clock next morning we had each drunk a cup of delicious Brazilian coffee, and the boats were under way.

All day we steamed slowly up-stream. We passed two or three fazendas. At one, where we halted to get milk, the trees were overgrown with pretty little yellow orchids. At dark we moored at a spot where there were no branches to prevent our placing the boats directly alongside the bank. There were hardly any mosquitoes. Most of the party took their hammocks

ashore, and the camp was pitched amid singularly beautiful surroundings. The trees were wawasa palms, some with the fronds cresting very tall trunks, some with the fronds—seemingly longer—rising almost from the ground. The fronds were of great length; some could not have been less than fifty feet long. Bushes and tall grass, dew-drenched and glittering with the green of emeralds, grew in the open spaces between. We left at sunrise the following morning. One of the sailors had strayed inland. He got turned round and could not find the river; and we started before discovering his absence. We stopped at once, and with much difficulty he forced his way through the vine-laced and thorn-guarded jungle toward the sound of the launch's engines and of the bugle which was blown. In this dense jungle, when the sun is behind clouds, a man without a compass who strays a hundred yards from the river may readily become hopelessly lost.

As we ascended the river the wawasa palms became constantly more numerous. At this point, for many miles, they gave their own character to the forest on the river banks. Everywhere their long, curving fronds rose among the other trees, and in places their lofty trunks made them hold their heads higher than the other trees. But they were never as tall as the giants among the ordinary trees. On one towering palm we noticed a mass of beautiful violet orchids growing from the side of the trunk, half-way to the top. On another big tree, not a palm, which stood in a little opening, there hung well over a hundred troupials' nests. Besides two or three small ranches we this day passed a large ranch. The various houses and sheds, all palm-thatched, stood by the river in a big space of cleared ground, dotted with wawasa palms. A native house-boat was moored by the bank. Women and children looked from the unglazed windows of the houses; men stood in front of them. The biggest house was enclosed by a stockade of palm-logs, thrust end-on into the ground. Cows and oxen grazed round about; and carts with solid wheels, each wheel made of a single disk of wood, were tilted on their poles.

We made our noonday halt on an island where very tall trees grew, bearing fruits that were pleasant to the taste. Other trees on the island were covered with rich red and yellow blossoms; and masses of delicate blue flowers and of star-shaped white flowers grew underfoot. Hither and thither across the surface of the river flew swallows, with so much white in their plumage that as they flashed in the sun they seemed to have snow-white bodies, borne by dark wings. The current of the river grew swifter; there were stretches of broken water that were almost rapids; the laboring engine strained and sobbed as with increasing difficulty it urged forward the launch and her clumsy consort. At nightfall we moored beside the bank, where the forest was open enough to permit a comfortable camp. That night the ants ate large holes in Miller's mosquito-netting, and almost devoured his socks and shoe-laces.

At sunrise we again started. There were occasional stretches of swift, broken water, almost rapids, in the river; everywhere the current was swift, and our progress was slow. The prancha was towed at the end of a hawser, and her crew poled. Even thus we only just made the riffle in more than one case. Two or three times cormorants and snake-birds, perched on snags in the river or on trees alongside it, permitted the boat to come within a few yards. In one piece of high forest we saw a party of toucans, conspicuous even among the tree tops because of their huge bills and the leisurely expertness with which they crawled, climbed, and hopped among the branches. We went by several fazendas.

Shortly before noon—January 16—we reached Tapirapoan, the headquarters of the Telegraphic Commission. It was an attractive place, on the river-front, and it was gayly bedecked with flags, not only those of Brazil and the United States, but of all the other American republics, in our honor. There was a large, green square, with trees standing in the middle of it. On one side of this square were the buildings of the Telegraphic Commission, on the other those of a big

ranch, of which this is the headquarters. In addition, there were stables, sheds, outhouses, and corrals; and there were cultivated fields near by. Milch cows, beef-cattle, oxen, and mules wandered almost at will. There were two or three wagons and carts, and a traction automobile, used in the construction of the telegraph-line, but not available in the rainy season, at the time of our trip.

Here we were to begin our trip overland, on pack mules and pack-oxen, scores of which had been gathered to meet us. Several days were needed to apportion the loads and arrange for the several divisions in which it was necessary that so large a party should attempt the long wilderness march, through a country where there was not much food for man or beast, and where it was always possible to run into a district in which fatal cattle or horse diseases were prevalent. Fiala, with his usual efficiency, took charge of handling the outfit of the American portion of the expedition, with Sigg as an active and useful assistant. Harper, who like the others worked with whole-hearted zeal and cheerfulness, also helped him, except when he was engaged in helping the naturalists. The two latter, Cherrie and Miller, had so far done the hardest and the best work of the expedition. They had collected about a thousand birds and two hundred and fifty mammals. It was not probable that they would do as well during the remainder of our trip, for we intended thenceforth to halt as little, and march as steadily, as the country, the weather, and the condition of our means of transportation permitted. I kept continually wishing that they had more time in which to study the absorbingly interesting life-histories of the beautiful and wonderful beasts and birds we were all the time seeing. Every first-rate museum must still employ competent collectors; but I think that a museum could now confer most lasting benefit, and could do work of most permanent good, by sending out into the immense wildernesses, where wild nature is at her best, trained observers with the gift of recording what they have observed. Such men should be collectors, for collecting is still necessary; but they should also, and indeed primarily, be able themselves to see, and to set vividly before the eyes of others, the full life-histories of the creatures that dwell in the waste spaces of the world.

At this point both Cherrie and Miller collected a number of mammals and birds which they had not previously obtained; whether any were new to science could only be determined after the specimens reached the American Museum. While making the round of his small mammal traps one morning, Miller encountered an army of the formidable foraging ants. The species was a large black one, moving with a well-extended front. These ants, sometimes called army-ants, like the driver-ants of Africa, move in big bodies and destroy or make prey of every living thing that is unable or unwilling to get out of their path in time. They run fast, and everything runs away from their advance. Insects form their chief prey; and the most dangerous and aggressive lower-life creatures make astonishingly little resistance to them. Miller's attention was first attracted to this army of ants by noticing a big centipede, nine or ten inches long, trying to flee before them. A number of ants were biting it, and it writhed at each bite, but did not try to use its long curved jaws against its assailants. On other occasions he saw big scorpions and big hairy spiders trying to escape in the same way, and showing the same helpless inability to injure their ravenous foes, or to defend themselves. The ants climb trees to a great height, much higher than most birds' nests, and at once kill and tear to pieces any fledglings in the nests they reach. But they are not as common as some writers seem to imagine; days may elapse before their armies are encountered, and doubtless most nests are never visited or threatened by them. In some instances it seems likely that the birds save themselves and their young in other ways. Some nests are inaccessible. From others it is probable that the parents remove the young. Miller once, in Guiana, had been watching for some days a nest of ant-wrens which contained young.

Going thither one morning, he found the tree, and the nest itself, swarming with foraging ants. He at first thought that the fledglings had been devoured, but he soon saw the parents, only about thirty yards off, with food in their beaks. They were engaged in entering a dense part of the jungle, coming out again without food in their beaks, and soon reappearing once more with food. Miller never found their new nests, but their actions left him certain that they were feeding their young, which they must have themselves removed from the old nest. These ant-wrens hover in front of and over the columns of foraging ants, feeding not only on the other insects aroused by the ants, but on the ants themselves. This fact has been doubted; but Miller has shot them with the ants in their bills and in their stomachs. Dragon-flies, in numbers, often hover over the columns, darting down at them; Miller could not be certain he had seen them actually seizing the ants, but this was his belief. I have myself seen these ants plunder a nest of the dangerous and highly aggressive wasps, while the wasps buzzed about in great excitement, but seemed unable effectively to retaliate. I have also seen them clear a sapling tenanted by their kinsmen, the poisonous red ants, or fire-ants; the fire-ants fought and I have no doubt injured or killed some of their swarming and active black foes; but the latter quickly did away with them. I have only come across black foraging ants; but there are red species. They attack human beings precisely as they attack all animals, and precipitate flight is the only resort.

Around our camp here butterflies of gorgeous coloring swarmed, and there were many fungi as delicately shaped and tinted as flowers. The scents in the woods were wonderful. There were many whippoorwills, or rather Brazilian birds related to them; they uttered at intervals through the night a succession of notes suggesting both those of our whippoorwill and those of our big chuck-will's-widow of the Gulf States, but not identical with either. There were other birds which were nearly akin to familiar birds of the United States: a dull-colored catbird, a dull-colored robin, and a sparrow belonging to the same genus as our common song-sparrow and sweetheart sparrow; Miller had heard this sparrow singing by day and night, fourteen thousand feet up on the Andes, and its song suggested the songs of both of our sparrows. There were doves and wood-peckers of various species. Other birds bore no resemblance to any of ours. One honey-creeper was a perfect little gem, with plumage that was black, purple, and turquoise, and brilliant scarlet feet. Two of the birds which Cherrie and Miller procured were of extraordinary nesting habits. One, a nunlet, in shape resembles a short-tailed bluebird. It is plumbeous, with a fulvous belly and white tail coverts. It is a stupid little bird, and does not like to fly away even when shot at. It catches its prey and ordinarily acts like a rather dull flycatcher, perching on some dead tree, swooping on insects and then returning to its perch, and never going on the ground to feed or run about. But it nests in burrows which it digs itself, one bird usually digging, while the other bird perches in a bush near by. Sometimes these burrows are in the side of a sand-bank, the sand being so loose that it is a marvel that it does not cave in. Sometimes the burrows are in the level plain, running down about three feet, and then rising at an angle. The nest consists of a few leaves and grasses, and the eggs are white. The other bird, called a nun or waxbill, is about the size of a thrush, grayish in color, with a waxy red bill. It also burrows in the level soil, the burrow being five feet long; and over the mouth of the burrow it heaps a pile of sticks and leaves.

At this camp the heat was great—from 91 to 104 Fahrenheit—and the air very heavy, being saturated with moisture; and there were many rain-storms. But there were no mosquitoes, and we were very comfortable. Thanks to the neighborhood of the ranch, we fared sumptuously, with plenty of beef, chickens, and fresh milk. Two of the Brazilian dishes were delicious: canja, a thick soup of chicken and rice, the best soup a hungry man ever tasted; and beef chopped in rather small pieces and served with a well-flavored but simple gravy. The mule allotted me as a

riding-beast was a powerful animal, with easy gaits. The Brazilian Government had waiting for me a very handsome silver-mounted saddle and bridle; I was much pleased with both. However, my exceedingly rough and shabby clothing made an incongruous contrast.

At Tapirapoan we broke up our baggage—as well as our party. We sent forward the Canadian canoe—which, with the motor-engine and some kerosene, went in a cart drawn by six oxen—and a hundred sealed tin cases of provisions, each containing rations for a day for six men. They had been put up in New York under the special direction of Fiala, for use when we got where we wished to take good and varied food in small compass. All the skins, skulls, and alcoholic specimens, and all the baggage not absolutely necessary, were sent back down the Paraguay and to New York, in charge of Harper. The separate baggage-trains, under the charge of Captain Amilcar, were organized to go in one detachment. The main body of the expedition, consisting of the American members, and of Colonel Rondon, Lieutenant Lyra, and Doctor Cajazeira, with their baggage and provisions, formed another detachment.