PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

The Ascent of Mount Roraima. By EVERARD IM THURN.

Map, p. 560.

I LEFT my home on the Pomerun river on the 10th of October, taking with me seventeen Indians, of various tribes, from that river, in my own two boats. One of these was a very large corial dug out of a single cedar-tree (*Icica sp.*?) which I had procured about two years before at the mouth of the Orinoco; the other, also a "dug-out," was somewhat smaller. On the 12th of the same month, having passed along the sea-coast and turned up the Essequibo, we reached the point where that river is joined by the Mazaruni. Here, partly because I was so unwell as to dread the start, partly because I had to wait for my companion, Mr. Harry Inniss Perkins, an assistant Crown Surveyor, who by the kind permission of His Excellency Sir Henry T. Irving, was to accompany me, and partly because I found it necessary to seek and purchase a third boat and to engage two more Indians, we waited until Thursday the 17th. On the morning of that day we made our real start, passing, during the first half hour, at the junction of the Mazaruni with the Essequibo, a Mr. Siedl, a professional orchid-collector, who had already visited the foot of Roraima some six months before, and who, having on that occasion met with a very fine new *Cattleya*,* was then starting, to collect more of the same plant, on a second journey to its home almost at the same moment as that of our own start, but by way of the Mazaruni, whereas we were to travel by way of the Essequibo and Potaro.

There is no need to dwell on any of the incidents of our journey up the Essequibo and up the Potaro as far as the mission of Ichowra, which we reached on the 24th of October; for the reaches of those rivers thus traversed by us have often before been described, and no special events distinguished this journey. At Ichowra we found the Bishop of British Guiana, who was then paying his first visit to that mission.

* This *Cattleya* has since been described by H. Reichenbach, jun., and named by him *C. Lawrenceana*, in honour of Sir Trevor Lawrence.

Referring to the paper, on our then proposed journey to Roraima, which I submitted to the British Association at Montreal,* it will be found that I had proposed to stay some days at Ichowra mission especially on account of the visit of the Bishop. For this, I had been led to believe, would attract to that place many of the Indians who live near Roraima; and from among these I hoped to select guides and porters to take us to their homes, following the Upper Potaro as far, perhaps, as its head.

We did indeed find a considerable number of Indians at the mission, though far fewer than I had been led to expect; but among those thus present were none from the immediate neighbourhood of Roraima, and even from any part of the savannah region in which that mountain stands only one party of Makusis. This party of Makusis, nine in all, under the leadership of one of the finest and best Indians I ever met, named Lonk, had come from a village called Konkarmo, on the Ireng river, in sight of, but very far distant from, Roraima, and by no means in a direct line between our then position at Ichowra and that mountain. As, however, it proved that of the Indians at Ichowra, these were the only available guides into the district into which we wished to penetrate, we engaged them to take us as far as their home. Consequently we had to abandon our purpose of ascending to the head of the Potaro; and instead we went up that river to a distance of but one day's travel beyond its great fall, the Kaieteur, and from that point, leaving the river, we walked back to the old mission station at Chinebowie.†

But before we reached the last named place some serious difficulties presented themselves. The portages on the Potaro, at all times long, steep, and difficult, were on account of the dryness of the season more than usually formidable. Once, in hauling one of the boats, luckily empty, through a cataract it sank, and was recovered not without difficulty; another time my favourite large cedar boat, while being dragged through the forest, past the impenetrable cataracts at Amutu, was pierced by the stump of a tree, and we not wishing then to delay to mend her, was abandoned until our return. On at last reaching the great Kaieteur Fall with the remaining boats, it became evident that the transport of these, as well as of our necessarily very great but indispensable stores of baggage up the portage path, which in many places is very steep and is some five miles in length, though possible, would occupy an undue time; so that we determined to leave our boats below and to use for the further short journey which we could still make by river two extraordinarily long, narrow, and very cranky "dug

* Proceedings R.G.S., 1884, p. 667.

† This station is marked in what is practically the only available map of the colony as Enapowow.

out" boats which we were lucky enough to find moored at the head of the fall.

Chinebowie we ourselves reached on the 8th of November; but we had to wait there till the 14th while sending back the two small boats twice for the baggage. Then began our walk, and at the same time began our constant and often serious difficulties in finding a sufficient number of Indians to carry the baggage. On the first occasion, at Chinebowie, we had to leave more than thirty loads behind, purposing to send back for them at the first opportunity.

Three days of most dreary and wearisome walking through the forest in a south-westerly direction, the path very frequently leading up hills of steepness very formidable to us heavily loaded as we were, brought us to the first human habitation, a small settlement of Partamona Indians,* called Araiwaparu. Here a day's rest became necessary, and was especially welcome, in that from that tiny clearing made for the settlement in the wide forest we were able, for the first time for three days, to see the sun and the clear and open sky.

The next morning we plunged at once back into the forest. Any kind of walking more wearisome than this long progress, lasting so many days, under a dense roof of leaves hardly broken anywhere sufficiently to let in any but the smallest gleams of light, over an apparently endless and universal floor, renewed throughout the year, of fallen and moulder-ing leaves, can hardly be imagined. Moreover one's whole attention is ever occupied and strained; for, under foot, the apparently smooth carpet of dead leaves is really most treacherously spread, not on the earth, but over, and hiding, a dense and intricate network of tree-roots of all shapes and sizes, any one of which may at any moment throw the unwary traveller heavily and dangerously to the ground; while overhead, hang down numberless coiled and looped and tangled bush-ropes and pendant branches of trees, each ready to catch round the neck of the walker or at least to sweep off his hat and cause him to stop, to his great discomfort and the disturbance of his many burdens. Long walking through such changeless gloomy places induces, if I may judge from my own experience, a curious and painful feeling. The senses of sight, sound, and touch are dulled to annihilation, except, and it is a great exception, so far as each of these senses is intensely and painfully on the watch for trap-like root or branch, threatening head or foot, for sound of water to break the stillness, for light to dispel the gloom; and corresponding with this cessation of the activities of the senses of the body comes a dreamlike activity of the mind, which either races back through a long series of just such of the past scenes in one's life as are of most painful or most unwelcome memory, or flies forward along the anticipated course

* The Partamonas are a branch of the Akawois. I propose to give some further account of them in a special paper which I propose to devote to the ethnological facts noted during our journey.

of one's life, which then seems one long vista of pains and sorrows and dangers. Thus on the fourth morning of our journey through the forest life seemed to me as gloomy as it could possibly be; the difficulties which lay before us seemed insurmountable; success seemed impossible.

So it was for the first few hours of our walk that morning. Then suddenly, at about 10 A.M., the forest ended in a distinct line and the path passed out of its shades on to the wide open savannah—and such a glorious savannah! It ran along the ridges of the mountain, down its slopes, over wide, well watered and green plains, up on to other ranges of curiously terraced mountains, and on, ever over mountain after mountain until it lost itself, to our eyes, in the blue misty distance. A most refreshingly cool, almost cold, and strong wind, loaded with sweet wide-gathered scents, hurried a few light clouds across the bright blue sky, lighted by a glorious sun; and the shadows of these clouds racing over the mountains and the valleys and over the many well-wooded ravines completed the intense and glorious beauty of the scene. From out of the long black prison of the gloomy forest, a step had brought us into this splendidly wide world with its atmosphere of freedom and welcome promise of success.

Soon, in the distance, perched on a flat and high grassy hill-top, a valley lying between us and it, we saw the high conical thatched roofs of a large Partamona village, which, like all the villages of that district, is situated so as to possess an outlook of quite ideal magnificence. Coming to this village, called Euworra-eng, an hour later, we found it full of people, many of whom were at the moment occupied in a large building, which they called a church, in singing, shouting, and talking, in curious attempt to imitate the service which some of them must have seen in the mission church on the Potaro.

Yet another day's walking brought us to Konkarmo, the village of our guides. From it the promised distant view of Roraima was indicated to us; but the mountain, if really visible, was so distant as to be discernible rather by the eye of faith than of the body.

Since we had left the forest—and this is equally true of our onward journey from Konkarmo to Roraima—the path, leading for the most part along the crests of long ranges of savannah mountains, was, in its circumstance of scenery, of probably unsurpassable magnificence; but it led often up or down most precipitous mountain sides and always over ground very rough and very stony. Our Indians, who, coming into those rough places from the plain of the Pomerun, where the almost universal mud is soft to the feet of the walker, and where, moreover, the denseness of the forest and the wide-spread network of river and stream cause almost all travel to be done by boat, were totally unused to carrying heavy burdens for long distances, and still less used to walking over stony ground, were so knocked up by the time we reached Konkarmo that it was evidently out of the question to send them back

for the baggage left at Chinebowie. However, we found no difficulty in getting a sufficient number of Indians to go back from Konkarmo; and these, in the wonderfully short space of a week, returned with all that we required.

I may here take the opportunity of stating that at each inhabited place to which we came we left a certain amount of provisions, to be used on our homeward journey; a circumstance which afterwards proved of the greatest advantage to us.

While our messengers were fetching the baggage to Konkarmo, we found plenty to occupy us. There, as we had found throughout the course of our journey to that point, the country had been so long without rain that hardly a flower was to be seen; and but very little botanical collecting was possible. But at Konkarmo there were other circumstances of interest. There, for the first and only time in Guiana, I saw stone implements made, and indeed actually learned to make them myself, after the rather peculiar manner there followed. There, too, the people, who were very numerous and most hospitable and kind, tried to interest us, and effectually succeeded in so doing, in many ways, especially perhaps by dancing and playing games for us after their own manner. Not the least curious or the pleasantest matter to be studied at Konkarmo was the extraordinary ecclesiastical mania which then possessed the people of that place and of that whole neighbourhood, inducing them to give up almost all work and to devote themselves instead, throughout the day, to an extravagant and perfectly unintelligent imitation of such church services as some few of the party had seen, when on their travels, at the distant mission. But these are all subjects which must be told of on some other occasion.

From Konkarmo, too, we sent for certain Arekuna Indians, living in the direction of Roraima, who were said to know the path to that mountain; and they, on their arrival, indeed, themselves pretended to know the way and agreed to take us. In the event, as far as their carrying powers were concerned, and in their willingness and good temper—the latter no unimportant considerations under such circumstances as ours—this party of Arekunas proved themselves right good men and true; but they caused us no little trouble in that none of them knew the path beyond the Cotinga river more than very imperfectly, and knew it not at all beyond the Arapu river, and in that their leader, "Arekuna John" as we called him, under a mask of good temper, concealed the most cunning, and almost the most grasping disposition that I ever met with even among his tribe.

It may be as well here very briefly to distinguish the various Indian tribes with which we came in contact. The Potaro river is almost exclusively occupied by Akawois Indians of the Partamona branch; and these same Partamonas have spread through the forest which reaches from that river toward the Ireng, and have even emerged from this

forest and occupied, as at the village which I have mentioned, of Euworra-eng, the edge of the savannah which extends from the limits of the forest to the Ireng. It was, therefore, through their country that we first passed. Next, when we were well on to this savannah, we came to the land of the Makusis, just at its most northern point. Upward from that, we passed at once into the land of the Arekunas, which stretches from there to and beyond Roraima. All the three tribes, the Partamonas, Makusis, and Arekunas, through whose districts we thus passed, are of Carib race and speak but slightly divergent languages. The three tribes differ from each other, however, considerably in appearance and still more in character. The Partamonas are large, strongly built people, ugly in body and in features, and dirty in habits. The Makusis, smaller, more slightly built men, with limbs of curiously beautiful form and wonderful agility, with unusually good features, cleanly in habit, most hospitable, obliging, and generous, are by far the pleasantest of all the Indians of Guiana. Lastly the Arekunas, people of large strong bodies and generally of ugly features, are physically the most powerful of all, and are of great good temper, but as companions of the traveller are objectionable on account of their extreme greediness of disposition; among all the many of their number whom I employed I never succeeded in satisfying one by the payment I gave, whereas I do not remember ever leaving a Makusi unsatisfied.

Early on the morning of the 28th of November we said good-bye with regret to Lonk and our other Makusi friends at Konkarmo, and started with our new Arekuna companions toward Roraima. The footpath led us, winding much, but always over the open savannah, to the Ireng river, which we crossed, at the customary Indian ferry, in three very long, narrow, and cranky dug-out boats which we found there. After another stretch of savannah, distinguished from a botanical point of view by the first appearance of a dwarf and very graceful bamboo which afterwards became a very common and characteristic plant along our path, we wound for a long distance through a light wood, the underbush of which consisted entirely of a beautiful scarlet-flowered shrubby *Justicia*, then in full and picture-like bloom. Next came another stretch of savannah; then, most wearisome of all, an Indian cassava field; and at last we reached our destination for the night, the first Arekuna settlement, called Nunie, on the Wotsa creek.

Here there were two complete houses and one unthatched and unwalled frame. For almost the only time within my experience the hospitality of the Indians was insufficient to induce them to give up even a part of either of their own houses, and we slung our hammocks to the unfinished framework. Immediately behind the houses was a hill of considerable height, up which we were taken just before sunset to see our first real view of Roraima, still far away to the west, or rather north-west. It was certainly a beautiful picture that lay before us. In

the furthest distance, reddened by the setting sun, rose the famous mountain of our quest; between it and us a vast mountain-covered plain, its hollows filled by the dark shades of evening, its highest points touched into wonderful clearness and colour by the last light of the sun. Soon all was dark; and then again, even while we strolled down to our hammocks at the foot of the hill, the mountain-encircled valley in which we were was new lighted by the strong white light of the moon; and in many places far up on the mountains round us, rose and fell, with most weird effect, the flames of great fires which in that season of dryness were burning the scanty vegetation of the mountain sides and sending up to heaven many a pillar of fire by night and cloud of smoke by day.

We got off from Nunie the next morning not without considerable difficulty in apportioning the extra loads among some additional carriers whom we were fortunate enough to find there. The pleasure of the start in the early mornings was nearly always spoiled by such difficulties as this, I having to wait behind adjusting loads, imploring people to take up extra loads, and then, after perhaps half-an-hour's delay or even three-quarters, having to hurry forward to get to the head of the long procession of carriers, often forty or fifty in number, who, in twos and threes at a time, had been able to start so long before.

The first half of our walk from Wotsa was through country very similar to that passed the previous day. So far, though we had climbed numerous steep hills only to descend almost immediately into almost correspondingly deep valleys, we had on the whole made a comparatively small ascent. But this morning, just after passing the last inhabited house which we were to see for three days, we climbed a tremendous hill and walked for the whole afternoon along a very curious long and narrow tableland of which our recent ascent was one boundary. The view was bounded on either side and close at hand by slight swellings of the ground some twenty or thirty feet in height; or if anywhere a more distant view could for a moment be obtained it was only of rolling, grass-covered, white hills. The soil on this tableland consisted for the most part of pure white sand, or rather of sandstone rock of so soft a nature that almost the lightest touch powdered it to sand; the vegetation was chiefly a low, hoary grey grass; and the general effect was of a desert white with hoar-frost. Water was very scarce; there was not a tree in sight with the exception of two small coppices seen in the far distance. Late in the afternoon we had still come to no trees to which we could hang our hammocks. Then we reached a tract where, as is not infrequent, the sand soil was overlaid by a thick layer of hard yellow clay, so sun-dried and so cracked as to resemble a very irregular tesselated pavement. Ground of this kind is called by the Indians "eppeling." On this special eppeling, in one place rather higher than the surrounding ground were scattered a considerable number of

low straggling rhododendron-like shrubs (probably a *Clusia* or nearly allied to the genus) with most exquisite flowers deceptively like those of an English dog-rose. Here, in default of a better place, we determined to spend the night. Three or four old hammock-poles lying on the ground showed that we should not be the first occupants of the spot. These poles served for my companion's hammock and mine. The men cut branches of the rose-flowered shrub, and with these made themselves romantic, but scarcely comfortable, beds on the ground.

The next morning, after following the tableland for yet a little further, we began to descend along an extraordinarily broad and almost perfectly smooth jasper rock, the sloping bed of a stream which was then almost dry. Wherever a little peatlike soil had accumulated on this rock grew sphagnum-like mosses, embedded in which, among other characteristic plants hitherto only met with on the Kaieteur savannah, were numerous, but singly-standing, plants of the curiously formed and coloured *Brocchinia reducta*, its two or three pale yellow leaves, overlaid with a greyish bloom, looking like a loose roll of two or three sheets of paper stuck on end into the ground.

After this, ascent and descent, both generally very steep, followed each other in rapid succession; and many streams, mostly jasper-bedded, were crossed, their white water contrasting beautifully with the smooth-topped step-like layers of polished red, or more rarely pale green, jasper over which they flowed or fell. One stream, the Wayanok, its bed not of jasper, but of ugly mud, had its banks well wooded, the trees meeting over its gloomy Styx-like waters; otherwise hardly a tree was to be seen, except where in the valleys long lines of æta palms (*Mauritia flexuosa*) marked the moist bed of a stream.

At last, at midday, we came to the Cotinga river just below Oriniduie cataracts, at a point where two coppices, one on either bank, faced each other, between which the stream ran, so broad and deep, that to cross without a boat seemed hopeless. Yet to stay where we were seemed almost equally impossible on account of the enormous numbers of sandflies which there, for the only time during our journey, filled the air and made life a burden. But some of our men saying they knew of a boat which they would fetch, we endured the sandflies as well as we were able for the rest of the afternoon; and in the evening the boat was brought.

The crossing of the river with all our baggage occupied an hour and a half the next morning before we could start once more on our savannah walk. Towards midday we ascended a very high grass hill and, resting just before reaching the summit, we saw a very beautiful scene. One of our party while in the valley below had carelessly thrown down in the dry grass the match with which he had lighted his pipe; and now down in the valley below us already a great field of fire was moving almost as rapidly as the shadow of a flying cloud across the vast plain.

Again, ten minutes later, having reached and passed the top of the

same hill, we suddenly faced another most glorious view of different character. Nearest and right opposite, across a narrow valley, rose the grand rocky mass of Waetipu, its highest point, a somewhat conical mass surmounting sloping sides covered in places with turf, in places with forest. On the right, the central mass of Waetipu passed down into a long wooded ridge, which on the extreme right rose once more to form the two most remarkable and pointed peaks of Macrobang; on the left of Waetipu, seen for once clear in the distance, appeared the tremendously magnificent south-eastern corner of cliff-walled Roraima, which was still a day's journey from us, and behind that again the equally rugged and magnificent end of Kukenam.

One more magnificent distant view of Roraima we had the next morning, just after rounding the south-eastern end of Waetipu; then we lost sight of it till the afternoon, when from a high ridge it appeared again close to us, while between us and it, far below us, lay the village of Turoiking,* at the junction of the Ipelima creek with the Arapu river.

When we reached the village it was empty, and, though there were signs of recent occupation, we were persuaded by the assertions of our Arekuna guides, who had now reached the end of the world as known to them in that direction, that it really was a deserted village. Most of the houses were more or less dilapidated, and the large "church," of the kind already mentioned, was almost in ruins. Matters did not look very bright for us just then. No one of our party knew the way across the low range which still lay between us and the towering cliffs of Roraima, that is from the valley of the Arapu river, in which we then were, into the valley of the Kukenam river, from which latter valley our first attack on Roraima was to be made; nor did any of the Arekuna carriers who had come with us so far wish to proceed further with us into lands quite unknown to them. Nor again, owing to the absence in our present position of the inhabitants of Turoiking, did it seem possible to procure either new guides and carriers or the supplies of fresh provisions which were very necessary for our large party.

It was, therefore, a pleasant sight when, late in the afternoon, a few of the inhabitants of the village straggled back into it. Among these was an old, but most extraordinarily strongly built Arekuna, named Simon, whose every word, corresponding to the size of his body, was an hilarious roar. He promised, if we would wait till the next day, to send his son the next morning to a village somewhat nearer Roraima to fetch guides, and perhaps carriers, who would take us to that mountain; and even that night he managed to procure for us a small supply of provisions. Unfortunately at noon next day his son returned with the

* Marked in the ordinary maps of the country as Ipelemuta, i. e. the place (*uta*) on the Ipelima creek. It is no uncommon thing to find a village with two names after this fashion.

unwelcome news that another white man had just arrived at the foot of Roraima, from the north, had taken away every available Indian as guide or carrier, and had bought up all the food, which was said to be very scarce in the valley of Kukenam. The white stranger could of course be no other than Mr. Siedl, who having started on his journey viâ the Mazaruni on the same day as we started by the Essequibo, had reached the point at which we were both aiming, one day in advance of us.

Our prospects were certainly gloomy; and we nearly determined to send back without delay, not only the Arekunas, but also all but three or four of the Pomerun men, and with these to push on to Roraima as best we might, finding our way by compass and leaving almost all our baggage behind us. Luckily, however, just before sunset two men were seen coming down the mountain from the direction of Roraima; and these, on their arrival, proved to have been most kindly sent by Mr. Siedl, who had heard of our arrival, to guide us farther. After this new arrival a second night was spent at Turoiking far more pleasantly.

Next morning, the Arekunas, who had come with us so far, suddenly announcing their wish to come farther, we advanced with all our party and baggage, and, after fording the Arapu and passing the ridge which here separates the water-system of that river from that of the Kukenam, we came soon after midday to the village of Teruta, which stands on a small eminence only separated from the southern slope of Roraima by the narrow bed of the Kukenam. Our arrival at this point was on the fourth of December.

The village where we now were was very full of people; and from the hill on which it stood various other houses were to be seen. There seemed therefore good prospect of obtaining sufficient Indians to help in our work. Food too, in the shape of cassava, yams, and pumpkins, was evidently abundant, despite the assertions that had been made to the contrary; and the only thing to disturb the comfort of our prospects was the unanimous and apparently truthful statement of every one that game and fish were so scarce as to be almost non-existent in the district.

Siedl, who had arrived at Teruta the day before, had gone up that morning to a house which he had built for himself far up Roraima, at the nearest available point to the base of the cliff-like part. We took up our quarters for a day or two in Teruta itself, in order to determine our further plans.

The view of the two mountains Roraima and Kukenam from the village of Teruta is of indescribable magnificence; yet, though words must fail to give any adequate idea, some attempt must be made to describe the main features of the picture.

The two mountains, the greatest length of both of which is from north to south, lie directly east and west of each other, only separated by a gorge, which is at one point very narrow and is apparently

throughout the greatest part of its length of no great width. Roraima, the easternmost of the two mountains, roughly speaking forms at its southernmost point a right, or perhaps a slightly obtuse, angle. Westward from the apex of this angle the side of the mountain runs upward in a generally straight but really slightly concave line for about four miles, almost directly north-west, and then, forming at that point a somewhat similar angle, which angle is the most western point of the mountain, its side then turns to the north-east. On the other hand, Kukenam, the westernmost of the two mountains, ends at the south in a somewhat rounded point, from which its eastern side runs upward for somewhat less than four miles in a north-easterly direction, till it almost meets the extreme western point of Roraima, and after there forming its eastern angle, thus exactly opposite the western angle of Roraima, turns again to the north, or perhaps slightly north-west. Thus the south-west face of Roraima forms with the south-eastern face of Kukenam a very obtuse angle, at the apex of which the two very closely approach each other, being only separated by the gorge at its narrowest point. Supposing, next, that a straight line were drawn to join the southernmost points of the two mountains, this would form a base-line making, with the above-mentioned angle, a triangle; and on this base-line, about midway between the southern points of the two mountains, stands the village of Teruta, which thus immediately faces the gorge between the two mountains and commands a full view of the south-western side of Roraima and of the south-eastern side of Kukenam.

So far I have been attempting to describe the real relative positions, as determined by actual observations, of the surroundings in which we now found ourselves. From this reality the appearance of these surroundings, as is not unfrequently the case, differed somewhat. From Teruta the two mountains seem to rise from a common sloping base; and, placed on this, each seems to consist in itself of a sloping portion surmounted by the cliff walls. Looking directly north, we saw straight into the narrow forest-filled gorge, on either side of which, like Titanic gate-posts, rose slope surmounted by cliff, on the right that of Roraima, on the left that of Kukenam. Thick woods entirely clothe the slope of the latter, fill the gorge between the two mountains, and have climbed up from out of the gorge just on the extreme western shoulder of Roraima. The greater part of the slope of this latter mountain, much broken into curious terraces and often fluted, if I may use the expression, in a very remarkable manner at right angles to these terraces, is for the most part grass-covered, though in places occupied by coppices; while on the extreme right, i.e. on the southern shoulder of the mountain, thick woods again occupy the entire slope. But even on Roraima the entire upper part of the savannah slope is as thickly wooded as is the whole of that of Kukenam. And, alike in both mountains, above the slope,

springing directly from out of the highest woods, rise the huge perpendicular cliff-walls, tremendous, and bare but for great patches of vegetation, really dwarf enough, but appearing at that distance merely as moss and lichen. Alike, again, in both mountains the sky-line, straight enough, is yet curiously jagged as is a very rough-torn edge of paper. And alike from both mountains fall streams of water, more or less visible according to the season, the most constantly conspicuous being, from Kukenam, the river of the same name, from Roraima the Kamaiwa and a river, of unknown name, with which we afterwards had close experience.

One very characteristic feature of the scene has not yet been mentioned. It has been stated that, on the extreme right as seen from Teruta, the whole southern shoulder of Roraima is wooded. From the cliff of that mountain where, at its southernmost point, it rises from these woods, a portion has at some time been vertically detached, and this still stands, a rude obelisk of naked rock rising from out of the forest to tower above the closely neighbouring cliff of Roraima.

Lastly, this mountain panorama, the key-note of the scene, as one looks at it from Teruta down in the valley below, being of gigantic vastness and overpowering size, is almost always rendered more gigantic, much more mystic, by the clouds and vapours which almost always float around it, often gathering into one mass so vast as to obscure the whole, still oftener piling up smaller, but still dense, masses here and there on the mountain or in the gorge. Rarely did we see the scene quite clear; a fact which, as the Indians were never tired of explaining to us, was owing to the habit of the mountain—they regard both mountains as one —of veiling itself whenever approached by white men.

This latter point reminds me to note the extreme veneration, and even affectionate regard, with which the Indians of that district, even those who live far from, but yet in sight of, Roraima, regard that mountain, vividly personifying it, it always seemed to me, in a more real fashion than even their wont.

By a lucky chance, on the day of our arrival the mountain was fairly free from cloud; so that we saw a ledge, running diagonally from the bottom to the top of the opposite cliff of Roraima, which, from where we were, certainly seemed to offer a very practicable way of ascent. Yet, knowing that of the few other than Indians who had visited Roraima and had pronounced its summit inaccessible almost all had tried to attack it from the very point at which we now were, we failed to persuade ourselves that our ledge was really practicable. And only at one other point on this face of Roraima did it seem in the least possible even to think of attempting an ascent; and this second point afforded but the very smallest gleam of hope.

The day after our arrival at Teruta, Perkins and I, with two of the Pomerun Indians, went up the savannah slope of Roraima as far as

the spot where Siedl had built his house. We found him some four miles up the slope, almost at the top of the savannah, at a point which afterwards proved to be 5405 feet above the sea-level and 1654 feet above the village of Teruta. He had made a tiny clearing within the edge of the forest where it met the savannah and had there established himself. He had visited this same point on Roraima in the previous April, and had then found, and collected, considerable quantities of his *Cattleya;* but the plants had perished on the way home, and he had now returned for a fresh supply. He had noticed our ledge, but was convinced of its impracticability; and he had moreover heard a tradition, which I afterwards heard but always discredited, that some Indians had once attempted to ascend by it to the summit, but had been stopped almost before they made any progress up it by a great ravine which, invisible from below, really separated it from the summit. No other point seen by him seemed, he said, to afford any hope of access.

The question which now had to be decided was whether to delay for a time on this south-western face of Roraima, which had been, comparatively speaking, so often visited and always pronounced inaccessible, in the hope that, with our greater advantages in the way of the longer time at our disposal and the sufficient, though by no means too abundant, supply of provisions, we might succeed in finding a way where others had failed; or whether it would be better at once to follow out our programme of walking round the mountain till perchance we might find an accessible way up one or other of its less known sides. While debating this, a glance at the ledge decided us to try it at all risks; and we returned down the mountain to our old quarters at Teruta, there to make preparation for reascending and building a house close to Siedl's.

The next day, Saturday, was spent in telling off twelve of our Pomerun Indians, who were to leave us and start for home the next morning, in order to reduce the demand upon the provision store; in writing letters to be carried home by these messengers; and in sorting the baggage so as to take up with us only the most necessary things, and even of these only such as our four remaining Pomerun Indians with a few Arekunas could carry up. Early on the morning of Sunday, our twelve companions who had come with us from home filed off in one direction across the savannah, while we who remained marched in the other direction up the slopes of Roraima.

The house which we built, and, as it turned out, inhabited for nearly a month, was close to Siedl's. Externally it was an ordinary Indian house, thatched, however, on roof and walls with the leaves of a large and handsome palm, a *Geonoma* of a species new to me but very abundant higher up the mountain. Inside, in the centre of the house, between our two hammocks, was a gridiron-like staging or babracot of hard green wood, under which a large fire was kept burning day and night; this arrangement being partly suggested by the extreme coldness of the

temperature, which at night sank as low as 48° Fahr., but was chiefly intended to afford means of drying the botanical paper, which, because of the great dampness of the air and the feebleness of such few rays of sun as forced their way through the almost constant mists, it was quite impossible to dry by ordinary means. Even though the paper not in use was thus kept constantly over the fire, and although almost every minute of my day during which I was not working in one way or another away from the house was devoted to turning and changing these papers, it was a matter of most extraordinary difficulty to dry the plants.

Our own house was finished even on the day on which we ascended; and the next day our Pomerun Indians built a similar but larger house for themselves. Later on we built another house for the living plants collected; and two parties of Arekunas who came up and attached themselves to us each built a similar house. Moreover, Siedl, beside his own house and that for his men, had two very large buildings which he gradually filled with the *Cattleya*. In fact, before we left the place it had become quite a large and picturesque settlement.

But I must return to the account of the beginning of our stay on Roraima. The savannah immediately in front of our houses was that same wonderful swamp which Richard Schomburgk had visited forty years before, and had so enthusiastically described as a "botanical El Dorado."* Nor was the inscription inapt. It extends over a considerable space of undulating ground, occupying in fact the whole of the upper part of the savannah slope, and, except where, in many places, rocks crop up, either singly or piled in masses, appears to the eye to be chiefly occupied by long waving grasses over which are borne innumerable rich large violet-coloured flowers of the lovely *Utricularia Humboldtii* and, on equally tall but branched flower-stems, the quaint yellow-brown flowers of an orchid (*Cypripedium Lindleyanum*). But, on looking more closely it will be found that almost equally abundant with the grasses are many small and various yucca-like plants, many heath-like *Befarias*, many more dwarf but lovely orchids, especially the beautiful and sweet scented *Zygopetalon Burkii* and a rosy flowered *Cleistes* (*C. rosea*), many ferns, and innumerable other plants. In not very frequent places, where the grass is not so long, are considerable patches of the "pitcher-plant" of South America (*Heliamphora nutans*), with its grotesquely pitcher-shaped leaves and delicate white flowers, borne on ruddy stems. On the rock patches, on the other hand, grow pretty flowered shrubs of many species, and among these many orchids, especially a long sprayed black and yellow flowered *Odontoglossum* (*O. nigrescens?*) and an *Epidendron* (near *E. imatophyllum*) with flowers curiously various in colour, mauve or rose to white and from yellow to fawn, many ferns from the low creeping kinds to the tall bracken (*Pteris aquilina*) and, yet taller, various species of tree ferns; and, though this is not abundant in that

* 'Reisen in Britisch Guiana.'

position, there also grows, most striking and suggestive of all to the Englishman who has been long in the tropics, a real blackberry (*Rubus Schomburgkii*) very similar to the hedge brambles at home. And again, very sparingly on the higher open parts of this savannah swamp, but more abundantly and luxuriantly inside the small coppices which break its extent, stands the remarkable aloe-like *Brocchinia* (*B. cordylinoides* Baker), which, occurring there in very far greater abundance and luxuriance, forms the chief physiognomic vegetation of the Kaieteur savannah. And again on the edges of the coppices of the savannah slope and on the edges of the forest in the midst of which this lies, are many other striking plants, a peculiar climbing bamboo, tree ferns of several species, especially a great cycas-like fern, thick stemmed with erect dark green fronds (*Lomaria Schomburgkii*), and among these, wonderfully luxuriant examples, with flowering stems of seven and eight feet high, of the various coloured *Epidendron* which has already been mentioned as growing, with far dwarfer habit, on the dry rocks of the savannah. It is no wonder that Schomburgk was enthusiastic about such a place as this.*

Many days we spent in exploring and visiting every accessible portion of this savannah slope and of the forest belt above, even as far as the base of the cliff, partly in order to examine the vegetation, but chiefly in order, when a few rare hours of clear weather admitted of this, from every available point to study the ledge up which we hoped to ascend. Sometimes it looked possible, sometimes impossible. To make clear the nature of the position some further account of the contour of this aspect of the mountain must be given.

The gradual savannah slope has already been distinguished from the much more abrupt forest slope. But in this latter again three regions or belts may be quite clearly distinguished. First, and immediately above the upper edge of the savannah slope, is a belt of very dense wood in which the trees are small, but stand very closely together, great quantities of the *Geonoma* already described and a few curiously dwarfed manicole palms (*Euterpe edulis*) occurring in it, the whole being much matted together by the long winding stems of the small bamboo. The path upward through this is steep and slippery, but there are few boulders. Next comes a belt of bush in which the vegetation is chiefly low and bush-like, averaging not more than from six to eight feet in height, and indeed consisting in great part of *Brocchinia cordylinoides*. The ground here is almost completely covered by boulders, though these are not often of any very great size. Next comes a belt of rock and tree, where the boulders, many and large, often tower overhead, and the trees few, stunted, gnarled and twisted, grow round, over and under the rocks, and their branches meeting overhead there intertwine to make a dense rock. In making a path through this belt one passes now over the

* The botanical observations made during the expedition will be dealt with in a separate paper.

branches now under the roots. But perhaps the most striking character of this belt, though it is evident in somewhat less marked degree on the other tree-covered parts of the mountain, is the universal coating of long and dense, green mosses which wraps rock, branch and trunk, and indeed every visible thing underhead and overhead, suggesting a feeling of muffled stillness much as does a coating of snow at home. And yet another feature, present in all the belts, but in much the most marked degree up here, is the sponge-like saturation of earth, moss, rock and trunk with moisture; and, consequent on this moisture, the vast abundance of luxuriant ferns, especially filmy ferns, is everywhere noticeable.

Lastly, immediately above this belt, between it and the foot of the cliff is a narrow zone chiefly occupied by vast quantities of the blackberry already mentioned, growing here among the loose débris which seems almost constantly to fall from the summit of the mountain. This latter belt reminds one strangely of home, not only because of its bramble-growth, but because interspersed in the latter are vast quantities of the South American form of our English bracken (*Pteris aquilina*), with a fern externally resembling the English male-fern, and large quantities of heath-like *Befaria*. Only the abundant clumps of *Geonoma*, a few tree ferns and many small but beautiful tropical plants of the same family, and the occasional flight of a humming-bird, remind one that one is in the tropics.

Having passed the bramble tract, to ascend just at the feet of the cliff and to look up offered a wonderful experience. The wall runs for the greater part of its two thousand feet height straight up, but at the actual top it overhangs. Water, falling continuously, even in the dry season in which we were there, from every part of the upper edge, reaches the ground not at the base of the cliff, but some four or five feet, or even sometimes further, from that base.

After due examination, it appeared that there would be especially three points of possible difficulty to be met in making an ascent by the ledge. In the first place, that part of the forest slope which we should have to pass before reaching the foot of the ledge had, as we then thought, never been penetrated by man and was of quite unusual density, chiefly on account of the great quantities of rampant bamboo which matted together the trees of which it was composed; and, while, at first, we had only our four Pomerun Indians, it really seemed almost out of the question to cut our way through this. Fortunately for us, many Arekunas came up the mountain to us, before many days, and, building a house for themselves, placed their services at our disposal; whereby we were enabled to have the path cut up as far as the foot of the ledge while we spent the time in other work. But a second difficulty, evident from below, was presented in the fact that the lower part of the ledge seemed much broken, and indeed appeared to be not so

much a continuous shelf but rather a shelf which had at some time been broken up into large masses of rock, which, towering over the forest, looked formidable enough from below. Siedl, till the time when we practically proved the possibility, maintained that it would be impossible to climb over this broken part of the ledge and even eventually on this account declined to accompany us on our ascent. But the most doubtful point of all was where, some two-thirds up the length of the ledge, a considerable stream of water fell on to it from the summit of Roraima. This stream, falling on the ledge, had eaten away, and made a deep gap, impenetrable to the eye from below, in its surface. It certainly appeared that this might well be impassable; and our only hope was that we might just possibly be able to climb down into it, and up its further side and so on to the upper part of the ledge, which from that point to the summit of the mountain seemed accessible enough.

The path to the foot of the ledge once cleared, and all such observations as could be made from below having been completed, we still had to wait for a tolerably clear day on which we might make our first attempt to ascend with some prospect of success. This we did not get for some time, to the great trial of our patience, we almost fearing to spend so much of our time on that side Roraima unless we could be more certain of success there than we then felt.

At last, on Sunday, the 14th of December, though the morning did not seem to promise an altogether fine day, yet, unwilling to lose another day, and fearing yet more to leave the Arekunas longer unoccupied lest they should have time to discover the discomforts of the place, we made a start for the top by way of the new path, at 9 A.M.

We found that the path had been cleared only just sufficiently to allow us to pass, and that not without considerable difficulty. The ground was exceedingly slippery, in consequence of the heavy rains which had recently fallen; and this special difficulty was enhanced by the fact that much of the ground was occupied by a large flag-leaved *Stegilepis* which, trodden or cut down as we advanced, gave us many a fall, on account of the great slipperiness of the whole plant and by the big *Brocchinia* (*B. cordylinoides*), the latter so densely placed that we had to walk over their tops, plunging and slipping about in the considerable quantity of water which each of these plants holds in its axil. Seldom, if ever, did we step on the real ground, but instead we climbed, hands and feet all fully employed, over masses of vegetation dense enough to bear our weight, over high-piled rocks and tree-stumps and not seldom under boulders of vast size, up tree-trunks and along tree-branches, across the beds of many streams so filled with broken rocks that the water heard trickling below was unseen. Nor did the dense and universal coating of moss, filmy ferns, and lungworts, afford any but the most treacherous foot-hold and hand-hold.

At last, about 11 A.M. we reached a station near the foot of the ledge,

at the base of the cliff, where some old cutlass marks on the trees attracting my attention, it appeared after inquiry from the Indians that Mr. Whitely had been some years before. How he reached it I do not know; certainly our path did not seem in any way to have touched his until just before the base of the cliff. I presume, but am not sure, that the station at which we now were was the highest to which Mr. Whitely attained, for there were no traces of any further advance having been made, up the ledge.

Our Arekunas had cleared the path a little further than the point where we now were; but on following this up we found it did not go far. From the point where their work had ceased, I sent them on to clear further, while I laid between papers such plants as I had already collected; but they soon returned declaring they were frightened and could go no farther. Then the Pomerun Indians came splendidly to the front, especially one named Gabriel, who declaring, on the strength of having once been between the mouth of the Pomerun and Georgetown in a small provision sloop, that he had been a sailor, went first with me up one of the stiffest pieces of climbing that one need wish to remember, till we reached the top of a shoulder, a considerable way up the face of the cliff; and from this point advance did not seem possible. The boiling-point thermometer here showed a height of 7321 feet.

For more than an hour past, thick mist had enveloped us; and not only did this now become thicker, but heavy rain also began to fall. The thermometer, though it was midday, fell to 54° Fahr., so that the cold, to us accustomed to the tropics, was intense. Moreover all the bushes and moss-covered trees which we had to grasp, and by their means to raise ourselves, had been like sponges filled with iced water, so that we could hardly hold on to them for the numbness of our hands. Under these circumstances we determined to turn homeward for that day, satisfied with having proved the practicability of making our way for a considerable distance up the ledge and even, as it afterwards appeared on examining the place from below, to a point above that at which the broken nature of the shelf had seemed to offer so serious a difficulty, so that only one doubtful point still remained to be passed, that at which the stream fell from Roraima on to the ledge. Our next attempt would, we hoped, be made on a finer and drier, and more especially on a clearer day. And whenever that attempt might be made we determined not to keep so near the inner edge of the ledge, under the base of the cliff, for we had found that this led us to an impassable point, but to keep as close as might be to the outer edge.

The journey downward was quick but far from pleasant. As in coming up we had got over much of the ground by crawling on all fours, so in going down we passed much of the way, but involuntarily, by sliding in a sitting posture.

For the next three days, heavy rain and thunder were almost in-

cessant. Then on Thursday, the 18th, came a bright morning, but with a few small clouds floating about down in the valley below us; but in consequence of the late rains the bush was still very wet and the stream falling from Roraima on to our ledge was very full of water. However, fearing that the rainy season had really set in, we determined to try to get at least as far as the foot of the fall—the one remaining doubtfully practicable part of the ledge—in order at least to know whether this last point was passable or not.

When we reached Whitely's station at the base of the cliff the weather was still clear. From there we followed the previous Sunday's path for a short distance, but soon, instead of going up to the top of the first spur on the ledge, to our Sunday's station, we began to cut a new path round the spur.

It should perhaps before have been explained that what had appeared from below the broken part of the ledge really consists of three rounded spurs, or shoulders, running from a little way up the cliff down on to the ledge; and that these spurs are all wooded, though not so densely as the ground below the ledge, while in parts a few huge boulders stand out over the tree tops. These three spurs occupy about two-thirds of the ledge as seen from below; then comes the part of the ledge on to which the fall dashes from the cliff above. After that the shelf slopes gradually upward to the top of the mountain, its surface, as we saw it through the field-glasses, covered with rocks and low vegetation, its upper part passing behind a sort of false face to the cliff.

To return to our progress after we left Whitely's station. The way, which was very difficult and wearisome though at no point dangerous, was again over, under, and along more tree-roots, branches, and trunks, again over, under, and along more rocks and boulders, and over and up steep slopes of wet slippery mud,—tree, rock, and mud being alike wrapped in the usual covering of wet moss. Over such ground as this we made our way round the three spurs, and at last came in sight of the part of the ledge on to which falls the stream from above. A fairly gentle slope, covered with coarse grass, taller than ourselves, led down, for a considerable distance, to the actual point on to which the water fell, which to our great delight, we saw was no deep impassable pool or ravine, but a broad, sloping reach of broken rocks; on the other side of this the ledge sloped almost as gradually upward, but this upward slope consisted for some distance of a slippery expanse of rock, broken by faintly marked step-like ledges, over the whole of which in the heavy rainy season a continuous flood of water must pour, but which was now almost dry. At last the way to the top lay before us clear and, if somewhat difficult, certainly passable.

We hurried down the slope before us, cutting our way through the long grass as quickly as we could. Then we came to the fall, under which we had to walk for some 150 yards. Luckily, comparatively little

water was coming over at the time; and this, descending from the great height of two thousand feet, fell upon us only as very heavy rain. In wet weather—and even two or three hours of rain, as we sometimes saw, swell these streams in a wonderful way—it would probably be quite impossible to walk under this fall, though even then it would perhaps be just possible to walk behind it, between it and the cliff, clinging closely to the face of the latter.

Just where the water fell on to the rocks grew in great abundance a low compact shrub, with small dense leafage and pretty little white flowers which I never saw anywhere else. The fall once passed we made our way up the slippery rocky part of the slope beyond, till we reached the upper part of the ledge, after its interruption by the cascade. This proved to be mainly covered by a dense growth of the *Brocchinia cordylinoides*, still very dwarf as compared with the habit of the same plant on the Kaieteur savannah; and through this it was neither easy to make our way, simply by reason of the density of this plant growth, nor was it pleasant, by reason of the immense quantity of water which, held by the curiously arranged leaves of these plants, was poured over us as, in advancing, we crushed and sank into their leafage. Interspersed with this *Brocchinia*, almost on every inch of ground where the former was not, and indeed more abundantly than its rival plant as we neared the top of the ledge, were large quantities of the remarkable, dwarf, and compact yucca-like plant which we had noticed as one of the most prevalent forms of vegetation in the swamp near our house and had seen in very widely separated patches on the savannah even as far as the valley of the Arapu river. The exceedingly stiff habit of this plant and the very acute point on the top of each of its leaves, together with a reputation which we heard assigned to it—as, after much subsequent practical but involuntary experiment, I now believe most unjustly—of poisoning every wound which it might inflict, made us walk over it as over carefully arranged rosettes of poisoned daggers. But interspersed among these two most prominent plants was a vegetation new and lovely enough to reward much suffering. Of this the most striking plant was a gloriously beautiful crimson flowered *Befaria*, a small, very dwarf, and compact heath-like shrub with very dark-green leaves, thickly incrusted with many wide-open star-shaped flowers, each some half inch across and of the richest and most intense crimson. A second *Befaria*, pink-flowered, was also either new to me or at least a much more dwarf and at the same time a very much larger-flowered variety of a species occurring in the swamp below. Another tiny shrub had its leafage and wiry stems completely obscured by wonderfully large pink flowers, clustered and shaped after the manner of those of the rhododendron. A curious fritillary-like flower was in abundance; and there were numerous small and delicately pretty, but not showy, ground orchids. The pitcher-plant (*Heliamphora*) was there too in

abundance, and of a size and luxuriance so far surpassing its habit in the El Dorado swamp that it seemed to us a new plant.

Up this part of the slope we made our way with comparative ease till we reached a point where one step more would bring our eyes on a level with the top—and we should see what had never been seen since the world began; should see that of which, if it cannot be said all the world has wondered, at least many people have long and earnestly wondered; should see that of which all the few, white men or red, whose eyes had ever rested on the mountain had declared would never be seen while the world lasts—should learn what is on top of Roraima.

Then the step was taken—and we saw surely as strange a sight, regarded simply as a product of nature, as may be seen in this world; nay, it would probably not be rash to assert that very few sights even as strange can be seen. The first impression was one of inability mentally to grasp such surroundings; the next that one was entering on some strange country of nightmares for which an appropriate and wildly fantastic landscape had been formed, some dreadful and stormy day, when, in their mid career, the broken and chaotic clouds had been stiffened in a single instant into stone. For all around were rocks and pinnacles of rocks of seemingly impossibly fantastic forms, standing in apparently impossibly fantastic ways—nay, placed one on or next to the other in positions seeming to defy every law of gravity—rocks in groups, rocks standing singly, rocks in terraces, rocks as columns, rocks as walls and rocks as pyramids, rocks ridiculous at every point with countless apparent caricatures of the faces and forms of men and animals, apparent caricatures of umbrellas, tortoises, churches, cannons, and of innumerable other most incongruous and unexpected objects. And between the rocks were level spaces, never of great extent, of pure yellow sand, with streamlets and little waterfalls and pools and shallow lakelets of pure water; and in some places there were little marshes filled with low scanty and bristling vegetation. And here and there, alike on level space and jutting from some crevice in the rock, were small shrubs, in form like miniature trees, but all apparently of one species. Not a tree was there; no animal life was visible, or it even seemed, so intensely quiet and undisturbed did the place look, ever had been there. Look where one would, on every side it was the same; and climb what high rock one liked, in every direction as far as the eye could see was this same wildly extraordinary scenery.

To complete such picture as I am here able to give of the scenery on the top of Roraima some few words further concerning the vegetation there occurring seem necessary, even though all details of this subject must be deferred to a future occasion. It has been said that the general character of all the plants there present is dwarf; it may be added that it is in this respect almost alpine. It almost all occurs in the little swamps, on level water-saturated ground, to which reference has already

been made; but a very few plants, hardly differing in character from those on these levels, occur in the crevices of the rocks. Those on the level ground appearing to the eye from a distance to be grasses, are in reality chiefly one or two species of grass-like *Pœpalanthus*; a few real grasses occur; great quantities of most splendid and luxuriant pitcher-plant (*Heliamphora*) and of the yucca-like plant said to be poisonous. An interesting feature connected with this latter plant was that on the summit of the mountain this plant was in full flower, though only expended seed-pods were visible on it below; and its yellow crowns of flowers surmounting the tall stiff stalks, which in external appearance may be very closely likened, both as to form and colour, to that of the well-known Crown Imperial (*Fritillaria imperialis*) at home, were sufficiently abundant and remarkable to lend a character of their own to the scene. Most, if not all, of the lovely flowering plants already described as occurring at the top of the ledge were also very abundant on the top; from which latter place, indeed, they had probably originally reached the ledge. The stunted tree-like character of the only shrub, five to six feet in height, occurring on the summit has already been mentioned. As regards the very scanty vegetation in the crevices of the rocks, this was almost entirely composed of two or three insignificant ferns, resembling in external character the European *Asplenium septentrionale*, and of a most exquisite and large flowered *Utricularia*, one of the three species to which I shall have to refer fully in dealing in another paper with the plants of Roraima.

Only after some time was the perception felt that there was after all some trace of order in this apparent disorder. What this order is, is rather difficult to explain briefly. The top of the mountain seems to be not, as was supposed, quite flat, but to have the form of a basin, very shallow relatively to its extent, its edge being formed by the actual rugged edge of the cliff. The surface of this basin seems to be divided up, in a manner which if it were artificial would be very irregular, but which as the work of nature is singularly regular, into a vast number of much smaller, yet still very shallow basins, these small depressions forming the amphitheatre-like level spaces, of which I have already spoken, the separating walls between them being represented by the curiously terraced ridges of rock, which, it appeared, are really irregularly semilunar, or even in some cases ring-like, in arrangement.

Moreover it is to be remarked that of these ridges each is of by no means one height throughout its extent; each of them, like a miniature mountain chain, rises, at curiously regular intervals, to form rugged pinnacles or pyramids, up the sides of which the rude step-like terracing, just as elsewhere along the ridge, generally runs, as though to offer a means of access to the traveller even up to the highest points.

The greatest depth of the general basin occupying the whole top of Roraima we had no means of ascertaining; nor can I estimate the depth

of the smaller basins in other parts than those seen by us. Elsewhere they may possibly be of considerable depth, forming large receptacles or ponds of water. But where we were I should say that the actual greatest depth of none of them was more than from 10 to 20 feet, and that they varied in diameter, roughly speaking, from 100 to 500 yards. The height of the highest pinnacle we measured, this one being the highest we saw, was about 80 feet.

These basins or depressions hold a considerable quantity of water, some of this being visible in the many small streams and pools described, much more being stored in the super-saturated vegetation of the marshes. Moreover the very rocks which bound these basins are themselves saturated and super-saturated even up to their highest points with water, which, constantly percolating slowly down into the basins, is constantly renewed from atmospheric sources. Even at the time of our visit, after so long a dry season, rock and hollow alike were almost full of water; so that but little was then flowing from them over the cliff-face to fall below, yet each single, not very heavy, shower of rain sufficed to swell the water in them to such an extent that the cascades over the cliff at once became of considerable size. It should be added that the edge of the cliff is not, as it appears from below, an even line, but is cut at right angles by various more or less deep channels, which, shielded from observation from below by the fact that they often pass parallel to the cliff behind false faces to the cliff, allow an outflow of water from the summit of the mountain down the cliff long before the water has reached the actual average level of the edge of the cliff.

These circumstances sufficiently explain most of the phenomena noticed from below by previous travellers. They explain the constant flow of water over the cliff, the rapid increase of this flow at certain intervals, and the rhythmic, intermittent or wave-like nature of the overflow in dry weather—for this latter phenomenon is evidently due to the fact that the water, which is not at those times at a sufficient level to reach the points of overflow, is then blown at short intervals from the surface of the shallow pools by the varying force of the breezes which are almost continually battling over the top of the mountain. They explain also Robert Schomburgk's statement that the water seems to flow not from the top of the cliff but from points some distance below; for the water flows through deep and narrow sloping channels, which it has cut for itself so as to issue at some distance down the face of the cliff, the channels themselves being indiscernible from below, sometimes because they are lost to sight in the general irregularity of the rock surface, sometimes because issuing from behind a false face to some portion of the cliff.

The one observation of previous travellers which I find it somewhat difficult to reconcile with facts, is that in which it has frequently been asserted, that the top is covered with trees. As regards the northern

end of the mountain, as I have not seen this, I cannot positively assert that there are no trees on it. But the remark has chiefly been made with reference to the southern end, at the point at which we ascended. I can only suppose that previous travellers, obtaining only a distant view, have mistaken the many and extraordinarily rugged pinnacles and points of rocks for the tops of trees.

Small fleeting masses of clouds were passing over the top during the whole of our visit, though it was a fine and otherwise a bright day. So many and changing were these clouds that I only managed to secure sketches by seating myself on a high pinnacle of rock from which four or five interesting points were visible at once, and turning to sketch each of these as each in turn became visible. I suppose that there are few days in the year when it is really clear on the top of Roraima. And these constant mists and the frequently prevailing heavy clouds and rain-storms, together with the constant and varying, but ever powerful winds, account for the super-saturation with water of everything on Roraima. Furthermore, the soft sandstone rock, always thus saturated and always exposed to the strong blasts of many winds, owes its fashioning into its very remarkable forms simply to extraordinarily active aerial denudation.

There would be great difficulty, almost amounting under present circumstances to impossibility, and only to be overcome by a very considerable expenditure of time and money, in clearing the path through the forest slope and up the ledge so as at least to be able to carry up hammocks and provisions, so as to be able to remain for a night on Roraima, or even to sleep at any point much nearer the top than "our house." It is also equally impossible to reach the top early enough in the day to explore more than a certain short distance from the point first reached. As far, however, as I could see from the summits of the tallest pinnacles, and this is no inconsiderable distance, the character of the whole of Roraima is that of the part more directly examined. And the summit of the neighbouring mountain of Kukenam, visible from Roraima because considerably lower than that mountain, is also of the same character.

There is no need to describe our climb down the mountain to our house. Once there, it became necessary to consider our further plans—whether to ascend again from this same point; or to proceed round the mountain with a view, not of trying any new point of ascent, but of ascertaining the practicability of such attempts in the future; or whether, satisfying ourselves with the fair measure of success with which we had already met, to turn homeward. The growing scarcity of provisions, the even much more serious exhaustion of our stock of beads, gunpowder, and other articles of barter, and the increasing symptoms of ill-health which I and some others of the party had for some time felt, decided me in favour of a return homeward.

Till the 24th of December we remained at our house on Roraima, occupied in finishing the various sketches, measurements, collections, and other tasks which we had undertaken. Then, on Christmas Eve, we descended to the village of Teruta, where we found that, without any prompting from us, the Arekunas had built a very large new house for us to spend our Christmas in.

Christmas Day at Teruta was wet and gloomy as far as the weather was concerned. By the evening the fall of the Kukenam river and the two falls, of the Kamaiwa and of the nameless river on to the ledge, had swollen to a very great size, so that the sound of their thunder was heard loud and far; and in addition to them eight other cascades, most of them hardly discernible in ordinary weather, now fell in great volume down the face of Roraima alone.

One other feature of that day deserves record. The *Cattleya* before mentioned had been brought to Siedl in enormous quantities and in splendid flower; and to us too it had been similarly brought until, fearing to increase our already too bulky baggage, I declined to take more. It grows abundantly, not far up Roraima, but along the bed of the Kukenam and other rivers, at the foot of that mountain, at an elevation of from 3700 feet to perhaps 4000 feet. Each walk by the side of these streams disclosed abundant specimens. But on Christmas Day I was lucky enough from one tree, overhanging the bathing pool in the Kukenam, close to Teruta, to collect two most glorious clumps of this orchid, the better of the two having five spikes of flower, of which one bore nine, each of the others eight, blossoms, in all forty-one of some of the largest and finest coloured *Cattleya* flowers ever seen, on a single small plant, the roots of which easily lay on my extended hand. Our Christmas decoration then, consisting of an enormous pile of these flowers, was a fitting farewell to the glorious flower forms of Roraima.

The next morning we started homeward, and returning along our old path, after some serious misfortunes, causing much delay, and not a few adventures, which must be told, if ever, on some future occasion, we reached our old starting-place at the junction of the Essequibo and Mazaruni rivers on the 28th of January. Siedl, who left Roraima two days after we did, arrived at this same point two days after us.