Notes on the Plants observed during the Roraima Expedition of 1884.

By the Editor.

AS was expected, the plants collected on the way to Roraima, and especially about the mountain itself, during the recent expedition to, and first ascent of, its summit, now that they have been examined and catalogued at Kew, have proved of great interest. Several specialists have most kindly lent their aid in examining and determining these plants. While Professor OLIVER undertook the bulk of the collection, Mr. J. G. BAKER, besides determining a few of the petalloid monocotyledons, has, aided by Mr. G. S. JENMAN of British Guiana, worked out the ferns; Mr. H. N. RIDLEY of the British Museum the Orchidiaceæ and Cyperaceæ; and Mons. E. MARCHAL the Araliaceæ. Again Dr. ENGLER has described a new Moronobea, Mr. BROWN a new Aroid, and Mr. MITTEN has named the Muscales. Lastly, Dr. MAXWELL MASTERS has supplied a note on two Passifloræ, perhaps new, but imperfectly represented. In all, fifty-three new species and three new genera have been described by these various workers.

The number of species collected would probably have been greater but for the extreme difficulty of drying plants in so excessively damp a climate as that of Roraima, and but for the fact that the other very serious labours inseparable from the ordering, and keeping in order, of such an expedition greatly curtailed the time I was able to devote to the preparation of botanical speci-

mens. As regards the number of new forms collected, generic and specific, this, great as it is, would undoubtedly have been much greater but for the fact, unfortunate in this respect but fortunate in others, that my collection was made at exactly the same period of the year [November and December] at which such collecting as had been done before about Roraima, by Sir ROBERT and Dr. SCHOMBURGK and by KARL APPUN, had been accomplished.*

Probably, never has a district of equally small size,

* The list of visitors to Roraima other than Redmen is as follows. SIR ROBERT SCHOMBURGK, then at the head of a boundary commission, was there in 1838 and again, with his brother DR. RICHARD SCHOMBURGK, the present curator of the Adelaide Botanical Gardens, in 1842. Both made considerable botanical collections, which were distributed, I believe, mainly between the Herbaria at Kew, the British Museum and at Berlin. KARL APPUN was at Roraima in 1864; his collections are chiefly at Kew. C. B. BROWN, then the geological surveyor of British Guiana, was there in 1869; two Englishmen FLINT and EDDINGTON were there in 1877; and two others MCTURK and BODDAM-WETHAM were there in 1878. None of these five last made botanical collections. DAVID BURKE, an English orchid collector, was there in 1881, and brought home certain interesting living plants, among others the South American pitcher-plant (*Heliamphora nutans*), which has, I believe, since been distributed by Messrs. VEITCH & SONS. HENRY WHITELEY, an English collector of birdskins, was there on several occasions between 1879 and 1884, and, I believe, was again there in 1885, but has collected no plants. SEIDEL, a German orchid collector, was there in April 1884 and again, with us, in December of the same year. He brought back only living plants, especially the magnificent Cattleya Laurenceana, which has since been distributed by Mr. A. SANDER. Of these, SEIDEL, the only traveller with an eye for plants who has been at Roraima except in the last months of the year, assures me that the abundance of flowers was much greater there in April than in December. But in the latter months the Indians' cassava fields are in full bearing and provision is therefore much more easily attainable.

after such brief and cursory exploration, yielded greater results, perhaps hardly has any such district yielded equally great botanical results as has Roraima; and still more probable is it that few such small districts are so distinctly marked off from the country immediately surrounding them by such great and remarkable peculiarity in their vegetation. In brief, the district of Roraima is, from a botanical point of view, chiefly interesting as an oasis clothed with a vegetation which is both in most marked degree distinct from that of the country which immediately surrounds it, and is at the same time, also in very marked degree, peculiar either to this special district or to this in common with a few other almost equally isolated, but widely separated, districts.

I cannot, therefore, it seems to me, devote these prefatory remarks, in which I have the privilege of introducing the list and description of my collection so kindly prepared by the authorities above mentioned, to a better purpose than to as emphatic a statement as I can make *of the isolated character, botanically, of the Roraima district, of its probable relation, botanically, to certain other probably similar districts,* and of the *general appearance of the very peculiar and distinct vegetation of these districts.**

The whole district known under the name of Guiana may be likened to a wedge driven into the north eastern shoulder of South America. Politically, it is thus placed between Brazil on the south and Venezuela on

* I use the phrase 'Roraima district' as including not only the mountain of that name but the whole of the small group of similar sandstone mountains of which Roraima is the best known, and at present the only explored member.

the north. For our present purpose it will, however, be better to describe its position somewhat differently. The artificially formed political divisions of the continent corresponding very closely, for obvious reasons, with the tracts naturally differentiated each by its own river system, and it being along the river systems that the migration of animals and plants chiefly occurs, therefore the customary and convenient names of these political divisions really correspond somewhat closely with the natural and important differences in flora, as also in fauna, which distinguish the various river basins. Thus, as Venezuela is essentially the tract drained by the great river Orinoco, and as Brazil is essentially the tract drained by the great river Amazon, and as Guiana, intermediate between these two, consists essentially of the parallel tracts drained by certain comparatively, but only comparatively, small rivers, of which the Essequibo, the Demerara, the Berbice, the Corentyn, the Saramacca and the Maroni may be mentioned, so the political names, to mention them in their order from north to south, of Venezuela, Guiana, and Brazil, represent also natural tracts which are really more or less differentiated, each from the other in its flora and fauna.

Now, as the whole of the tract under consideration—that drained by the Orinoco, the Amazon and the intermediate rivers—rises gradually, or more generally by steplike ascents, from the sea-level on its east, toward the table-land on its west—the table-land of the centre of the continent—it is of course on this table-land that the rivers take their origin. And, as owing to the irregularity of the surface of this table-land, and still more that of its slope toward the eastern sea, it happens that

each of these rivers collects its headwaters from unusually widely separated localities, and it often happens that two or more of these rivers draw some portion of their headwaters from unusually contiguous localities. Thus it is conceivable, and even probable that any peculiar vegetable forms, or animal forms, which may originate at one of these localities which supply water to very divergent river systems, may distribute themselves over very wide areas by passing along the courses of the various rivers arising there.

It happens that the rock-pillars of the Roraima group, rising some 5000 feet over the general level of the sea, pour down from their summit streams which go to swell the Orinoco, the Essequibo and the Amazon, in other words the three rivers respectively of Venezuela, Guiana and Brazil.

Now, as has been already indicated, the flora of Roraima is of a very remarkably peculiar character. A most interesting question, still awaiting solution, therefore arises, as to the relation of this flora of Roraima to the floras of Venezuela, Guiana and Brazil.

No answer, I say, has yet been attempted to this question; nor can I pretend to suggest that answer. I am, however, able to give, as data to be considered in the question, some very general account of the flora of Guiana, and a rather more special account of the flora of Roraima in its relation to that of Guiana.

Guiana, as has been said, rises gradually from the east toward the high table-land of the interior of the continent. But now, instead of thus placing ourselves in imagination on its seacoast and looking westward up its gradual slope, let us imagine ourselves on the

table-land, on Roraima, and that we are looking eastward, down toward the sea. We should find, were such a bird's-eye view really possible, that the table-land, or savannah as it is there called, is an open, generally treeless country, its elevated surface hardly anywhere level, but swelling up in many hills and even in some mountain ranges. We find that only along the courses of the rivers, or in the lower parts where water has accumulated in some form, are there more or less extensive belts of trees; and that, on the savannah itself, even these trees are, considering that we are in the tropics, of no great size. Further eastward, on the lower part of the slope, toward the sea, where the rivers have already grown wider and approached each other more nearly, the trees are more in number and of larger size. Still further eastward, yet lower down the slope, the belts of trees, pertaining each to its own river, have widened with the rivers, till they have approached, and then joined, each other. And here the trees are of yet larger size. At last, at the bottom of the slope between its foot and the still far-distant sea waves, the wide tract of alluvial soil which has been deposited between the slope and the sea, having either been brought down by the rivers or cast up from the sea, is virtually entirely occupied by the omnipresent forest of trees, which have there attained their true gigantic tropical size. If we except certain small patches of very swampy open land, locally called wet savannahs, within this forest of the alluvial tract, all is forest except the very narrow strip of land actually washed by the waves, which has been cleared by men for habitation and cultivation, and not even that toward the north.

Very different and distinct flora characterize the parts of Guiana thus variously conditioned; though, naturally, a certain number of species are common to all three.

Where the narrow sea-washed strip has been artificially disforested, a generally dwarf and weed-like flora, very largely consisting of non-indigenous plants, prevails.

Within the forest, perhaps the most noteworthy features of the vegetation after the generally great height of the trees and, often, the abundance of palms, are, in the first place, the great scarcity of mosses, herbage and low-growing plants, especially of any such with conspicuous flowers, and the consequent bareness of the soil, which is relieved by only a few scattered ferns, ginger-worts, caladiums and other aroids, dieffenbachias, cyperaceæ and other such shade-loving plants, and, in the next place, though this is hardly discernible from below, the abundance of the flowering creepers and epithytes spread over the matted tops of the densely placed, lofty trees. The representatives of the low-growing bright flowering plants of the thinner, lighter, woods of temperate climates have here, in this dense shade of the tropical forest, to send their immensely long flowerless creeping stems up some one or even two hundred feet, to reach above the highest tree-branches, before they can break into bloom. Only as semi-aquatics along the riverside are there a few showy flowered dwarf plants.

Quite different again is it on the savannah, where, among the grasses which, of course, form the chief vegetation, are scattered a considerable number of bright flowered dwarf plants,—though even here the abundance of bloom very rarely reaches the extraordinary develop-

ment which it often does in the meadows of temperate climates. Rather striking, too, is it that, on these savannahs, of the bright-flowered plants many, unlike those of temperate meadows, are here also true climbing plants, legumes chiefly and various species of *Echites*, though their stems, instead of climbing far and high over giant trees, here only ramble weakly and briefly over the short grasses.

In each of these thus distinct floras, of the coast, the forest, and of the savannah, the number of species is, of course, great; but in each separate district the species characteristic of it are as a rule remarkably widely and evenly scattered throughout its extent. For example, within the forest district, probably by far the larger number of species have an unbroken distribution throughout the district from north to south, though they may be limited from east to west, according, that is to the greater or less distance from the sea or to the higher or lower position on the general upward slope of the country. On the savannah, the general level of which probably corresponds more or less closely with the general level of the main table-land of that part of the continent, the distribution of the main species is still more even and monotonous. On almost every part of the savannah certain grasses, certain dwarf shrubs and certain herb-like plants, form the main vegetation. Yet a few remaining parts are marked by the occurrence of certain distinct and, as for the convenience of the name we may call them, localized species, which are scattered more or less widely among the more ordinary forms. And again, a very few other parts are still more distinctly marked, are made very distinct areas, by the more or less com-

plete absence of the more ordinary forms and the substitution within their limits of an entirely new and generally very distinct set of species. These areas with a few localized species, of which several were passed by us on our way to Roraima, and still more these areas of quite distinct vegetation, of which the Kaieteur savannah, across which we passed, and still more Roraima itself, are remarkably fine examples, seem of the utmost botanical interest.

A few notes must first be given of the species here described as localized. It must be remembered that these notes were made during a single walk, long as it was, through a country otherwise almost absolutely unknown; so that though these species were noticed by me because I saw them either only in one spot or at least in very few spots—*i.e.* I passed through either only one distinct group or through very few such groups of them—yet it is of course impossible to assert that many other such distinct groups do not occur wherever the requisite soil and other circumstances permit.

A considerable number of such localized species occur on tracts where the soil is of so peculiar a nature as to have earned a special name for such places from the Indians, who call them *Eppellings*. This name is applied by the Arekoonas to certain tracts in which the underlying substance of very soft sandstone is overlaid by a coating of hard dense and dry mud or, in some other cases, of hard conglomerate. Wherever, as is often the case, this hard mud surface is unbroken it resembles an asphalt pavement, or perhaps rather a floor made of hard-beaten earth. But this curious earth-surface overlies hill and dale alike, and is therefore not often level.

Wherever, then, there has been the slightest crack in its surface, rain water gathers, and having once obtained a lodgment it eats away and enlarges the crack. The result is an eppelling surface which, instead of being like an asphalt pavement, is like a pavement formed of irregularly-shaped and scattered flag-stones. But again, the mud-layer which overlies the eppelling being by no means thick, whenever this has once been indented, as just described, by many cracks enlarged by water, these cracks are soon engraved through the mud-layer down to the soft sandstone below; and, when this has once occurred, the sandstone thus exposed, which yields to the action of the water even more readily than does the hard mud, is rapidly worked out. In this way the eppelling is made to assume the form of a number of blocks, often pillar-like, of sandstone, each of these blocks being capped and protected by a patch of the original hard earth, or, in other cases, of the original conglomerate.

Now, where the original eppelling surface is unbroken, in which state we have compared it to an asphalt pavement, it is as entirely devoid of vegetation as such an artificial pavement would be. But where the surface of the eppelling has reached its furrowed stage, a few plants find lodgment, chiefly certain orchids and other such plants, of which the roots are of such a nature that, in the dry season, when the furrows are water-less, the whole plant shrinks into complete rest, and even in some cases loses its root-hold and is blown about on the surface of the eppelling until, when the next rains come, it again throws out anchor-like roots into some new furrow. One orchid of this wandering tendency is a Catasetum (C. cristatum?) [No. 148]; another is

the new, and very beautiful *Oncidium* named and described by Mr. RIDLEY in the appended list as *O. orthostates* [No. 12]. Sometimes, too, in this same state of the eppelling, especially where such ground occurs on the brows of exposed hills, shrubs of considerable size find anchorage in the furrows and flourish. One such hill-top which we passed was made very beautiful in this way by a large and isolated patch of the large rosy flowered *Bonnetia sessilis*, BENTH, [No. 11]. In another similar place we passed through a distinctly marked patch of the compact *Stifftia condensata*, Baker, [No. 10]. And more than one such place was distinguished by thickets of *Gomphia guianensis* [No. 15].

Lastly, as regards the eppellings, where the furrows of these places have been worked down into the sandstone, and have been much enlarged, the deep ravines and pits of all sizes thus formed, though bare of vegetation wherever the process of water-washing still continues in violent action, are where this action has ceased, owing to the stoppage of the outlet, or has become much moderated, compatively thickly clothed with vegetation.

Another remarkable localized plant, though not occurring on an eppelling, was the beautiful *Aphelandra pulcherrima* [No 14]. It has already been said that even on the otherwise open savannah, more or less extensive belts of forests often clothe the sides of the narrower parts of the valley through which the rivers run. One such place we came to, where, after crossing the Ireng river and the low watershed which there separates that river from its tributary the Karakanang, we were descending toward the level of the last-named river. It was here that, in a somewhat extensive wood

of which most of the trees were common species of *Cassia*, we found the dense, shrubby underwood to consist almost entirely of this beautiful, scarlet flowered *Aphelandra.*

Throughout a small tract on either side of the Ireng river, where the ground was almost entirely covered by a gravelly layer of shattered conglomerate, a very beautiful herb, with flowers of an intense violet blue—a very rare colour in Guiana,—was common and pleasantly reminded me of our English 'vipers bugloss.' It was *Stachytarpheta mutabilis. v.* [No. 1], which seems to me to correspond to my description of a localized species.

Again, between the Ireng and the Cotinga rivers grew in abundance, and evidently as a native, a plant [*Fourcroya gigantea*], which, common enough near the coast of Guiana in cultivation, is nowhere else, as far as I have seen in many wanderings, wild in that colony.

Lastly, as regards localized species, I would mention several dwarf bamboos, none of which unfortunately did I succeed in finding in flower. One of these, a wonderfully graceful species, appears to me peculiar in Guiana, in that it grows in dense thickets, on the open savannah. This was on the Ireng river, and more sparingly onward from there toward the Cotinga. Another of these bamboos (*Chusquea* [sp. ?] No. 18), I think the most graceful plant I ever saw occurred sparingly, and only in one spot, on the Arapoo river close to the village of Tooroiking. A third bamboo, a climbing form [No. 359], occurred to me first on the same river, but is much more common on Roraima itself, and should perhaps be spoken of in connection with the vegetation of that mountain.

Turning next to the areas of distinct vegetation, the

first to be mentioned is that of the Kaieteur savannah.* This is certainly a very remarkable place with a very remarkable vegetation. It is an open space, some two miles long by one across, in the heart of the ordinary dense forest, and some four days' journey on foot from the nearest open country. It has been said that the descent from the table-land of the interior toward the sea is not a gradual slope but occurs chiefly in a series of steplike descents which are generally of no great individual height. But the descent at the Kaieteur takes the form of an almost abrupt cliff—at the Kaieteur fall itself it is an actual cliff—of between seven and eight hundred feet in height. The Potaro river, rising apparently from the neighbourhood of, but not actually on, Roraima, after an unknown upper course of considerable length, here runs along one side of the almost perfectly level Kaieteur savannah and precipitates itself, at the east end of that savannah, down the abrupt descent of 800 feet. The savannah itself is virtually a flat exposed rock, many parts of which are as absolutely bare as a London pavement. This rock is sandstone, which, as in the eppelling—indeed it probably is an eppelling, but of unusually unbroken surface—is capped by a harder material, by a layer of conglomerate. Just as the hard surface of the eppellings cracks and eventually affords roothold in the fissures thus made for plants, so the hard conglomerate covering of the Kaieteur savannah has cracked, and in many of the fissures thus produced has given root-hold to plants.

* A very instructive paper on 'The aspect and flora of the Kaieteur Savannah' by Mr. G. S. JENMAN, F.L.S., is to be found in the firsr volume of *Timehri*, p. 229.

Some of these latter fissures have gradually been filled up by the accumulation of vegetable matter ; others remain still open. On this savannah, however, the fissures are larger than is commonly the case in eppellings, are in fact often very long, though generally narrow. Many of these are now entirely occupied by shrubs and dwarf trees. The lines of these masses of vegetation, necessarily following the lines of the fissures, present, in most remarkable degree, the appearance of the well marked lines designed by a landscape gardener ; and the whole effect is as of an artificial garden, with regular groups of shrubs separated by wide paths and roads of clean bare rock. Moreover it is not only in the fissures that plants grow on this savannah. As on the eppellings so here to, a certain number of plants find sufficient roothold in the vegetable accumulations in the slight depressions in the conglomerate sheet before these have been engraved deeply enough to leave the sandstone exposed and to make regular fissures.

But not only is the arrangement of the vegetation of the savannah thus very remarkable. The plants composing this vegetation are also individually of great interest. As might be expected, very few of them occur in the forest which everywhere, and for a great distance, surrounds this strange open space. Much more remarkable is it that very few of these plants occur on the nearest savannah, nor indeed, on the general savannah land of the interior. And most noteworthy of all is it that a very large number of these peculiar plants of this isolated savannah occur, often with slight but interesting differences, on Roraima.

By far the most striking, as it is also the most abun-

dant, plant on the Kaieteur savannah is a huge aloe-like Brocchinia (*B. cordylinoides*, Baker) which was gathered there by Mr. JENMAN and myself some years ago but which was, until the Roraima expedition, unknown from elsewhere. This gigantic plant, of such striking aspect as to compel notice even from the most unobservant traveller, is ranged in enormous numbers over the Kaieteur savannah, and indeed makes, to a large extent, the strangeness of that strange scene. There the height of a full grown specimen is, under the most favourable circumstances, about 15 feet; and, in the older specimens at least, the crown of leaves is supported on a tall bare stem. It seems also there to flower abundantly. We shall see that the plant occurs, but with slightly different characters, on Roraima. Moreover, at the Kaieteur, in the axils of the leaves of this *Brocchinia*, and only in that position, grows a very remarkable and beautiful Utricularia (*U. Humboldtii.* Schk.), with flower stems 3 or 4 feet long, supporting many splendidly large violet flowers. This plant too we shall find on Roraima, but also with slightly different characters from those which it exhibits at the Kaieteur. Another remarkable and distinct plant on the Kaieteur savannah is a low-growing Brocchinia (*B. reducta*, Baker), also previously known only from there, which may be roughly described as resembling three or four sheets of yellowish grey foolscap paper, rolled loosely one round the other, the whole standing on one end of the roll. This plant I did not observe on Roraima, though I feel convinced that it will one day be found there; but I did see it, in very considerable quantity, in one small district about half way between the Kaieteur and Roraima. Only one other

plant common, but with a difference of form, to the two districts can be mentioned here. Mr. JENMAN found at the Kaieteur a very striking new Moronobea (*M. Jenmanni*) ; and I found on Roraima another very striking new Moronobea (*M. intermedia, N. sp., Engler* No. 337) of which its describer, says that its intermediate between *M. riparia* and *M. Jenmanni.*

In short, the Kaieteur savannah and Roraima may be regarded as two isolated areas marked by the very peculiar vegetation, which vegetation is, however, to a noteworthy extent, common to the two.

Before passing on to the district of Roraima, I may mention that if I may judge from the reports of the Indians, and of the one or two white men who have been there, savannahs curiously like this very remarkable example at the Kaieteur occur (1) above Amailah fall on the Curiebrong river, a tributary of the Potaro, (2) above Orinidouie fall on the Ireng river, and (3) above a certain very large fall which is reported to exist—indeed I have myself heard the roar of its waters—on the Potaro, about two days boat journey above the Kaieteur. In each of these places the large and not easily mistakable *Brocchinia cordylinoides* is credibly said to occur ; and it seems highly probable that, with this, some of the other, but less conspicuous, plants of the Kaieteur occur also on these other savannahs. In short, it may very probably be that each of these reported fall-savannahs is a distinct area, parallel, and similar in vegetation to the Kaieteur savannah and to Roraima. In passing it may also here be noted that apparently a *Brocchinia*, similar to *B. cordylinoides* occurs on the Organ Mountains near Rio

in Brazil, reached by GARDNER in 1837, and that in the axils of its leaves occurs an Utricularia (*U. nelumbifolia*,) which, to judge from GARDNER'S passing descriptions, must be strikingly similar to *U. Humboldtii* as it occurs on the Kaieteur savannah.* Possibly, nay probably, the Organ Mountains, too, resemble in some other of their vegetable features the Kaieteur savannah and Roraima.

Let us now pass to the consideration of Roraima itself as an area of distinct vegetation. And in so doing a few words must just be said to recall the physical features of the mountain.

Roraima is one, certainly the best known, perhaps the most remarkable, of a group of pillar-like sandstone mountains capped with hard conglomerate, which group is, it seems to me, identical in nature and origin with the groups of sandstone pillars, capped with conglomerate or hardened mud, of the eppellings already described. In short, Roraima and its fellow mountains seem to be an eppelling on a gigantic scale. Some notion of how large the scale is may be gathered from the facts that Roraima itself, one pillar of the group, is almost exactly four miles wide along its south-eastern face, and is apparently seven or eight miles long from south to north, and that its height is some 5,000 feet above the general level of the plain from which it rises.†

* Gardner's description of the vegetation of the Organ mountains (see his "Travels in Brazil." London, 1849. Especially pp. 50–52 and 402–403) reads extraordinarily like an account of the vegetation of Roraima. The height of the two elevations is about the same, but the Organ range consists almost exclusively of granite, not, as does Roraima, of sandstone.

† In a recent number of the Proceedings of the Royal Geographical Society (June 1886) is a paper by Mr. James W. Wells, C.E., on a

This 5,000 feet of height, it must be explained, is made up of a sloping base, the pediment of the pillar, of about 3,000 feet, which is surmounted by the more strictly pillar-like portion, 2,000 feet in height. The plateau on top of the pillar is a very slightly, indeed almost imperceptibly, hollowed basin—four miles wide by some seven or eight miles long, it must be remembered—over which are scattered innumerable single rocks and piles of rocks, the largest of which are apparently some eighty or ninety feet in height. The sloping basal part of the mountain is, everywhere but toward the south-east covered by dense, but not lofty, forest; while on the south-east a considerable portion of it, which portion does not however extend up to the foot of the actual cliff, is treeless and grass-covered. The cliff itself is bare, but for a comparatively few mosses, ferns, grasses and trailing plants clinging closely to the rougher parts of its surface, especially where the many water-falls trickle down the rock-face, and for the dwarf shrubs, ever dwarfer and more alpine in character toward the top, which have found a lodgement on the few transverse ledges which break the evenness of the surface. The hollow basin at the top of the pillar is, wherever a little soil has accumulated in the depressions of the bare

group of mountains apparently very similar in physical feature to Roraima, though on a much smaller scale, which he discovered further south on the continent. Mr. Wells was kind enough to show me a series of his sketches of these mountains and the country surrounding them. Not only was the similarity of the mountains to Roraima striking, but I was also much struck by some sketches of places exactly corresponding to what I have described as *Eppellings*. Mr. Wells, while disclaiming all botanical knowledge, assures me that the vegetation of his group does not correspond with that of Roraima.

rock which constitutes the greater part of its surface, clothed with a dwarf herb-like vegetation of most remarkable appearance, consisting largely of various species of *Pœpalanthus*, a *Drosera*, a few terrestrial orchids—these not very conspicuous in flower—, a remarkable low growing aloe-like *Abolboda* of which I shall have more to say hereafter, various ground-clinging shrubs, of Alpine, vaccinium-like, character, and of a very few single shrubs, all of one species [*Bonnetia Roraimæ Sp. N.* OLIVER No. 330], of larger growth, though even this is but some three feet high.

Nor in this brief sketch of the physical features of Roraima in their bearing on the vegetation is it possible to avoid mention of the great moisture of the atmosphere which surrounds the mountain. The shallow basin of the upper plateau ever holds much water, and probably at times is almost full; the sides of the cliff are ever moistened by the innumerable rills and streams poured down from the plateau above to the sloping base; and this basal portion itself is, on the more level, undulating parts of its exposed surface, a mere spongy swamp, while in its forested parts it is traversed by almost innumerable rills hastening down to join the large rivers of the plain below.

As when dealing with the vegetation along our line of march to Roraima I pointed out that I could only pretend to speak of the plants actually along that line, so in now dealing with the vegetation of Roraima itself I can only speak of that of the south-eastern side of this mountain, which alone I was able to examine closely. We spent nearly a month on this side, where it is comparatively treeless, savannah-like and swampy; and we climbed to

the top of the mountain by a ledge running obliquely up this south-eastern face of its cliff.

It was not till we reached the top that we saw the most remarkable features in the wonderful plant-life of this very distinct area of vegetation; but even while only approaching the base of the mountain, which for convenience of description I will take to be marked, on the south-eastern side, by the bed of the Kookenaam river, and while we were still far off we saw for the first time plants which we afterwards found commonly on Roraima—the out-posts, as it were, of the remarkable group of plant-forms centred on Roraima. And from the moment when the first of these distinctive plants of the mountain was met with till the moment, some weeks later, when we reached the top we ever travelled onward into a more and more peculiar flora.

Our discovery on the savannah, a full day's journey from Roraima, of the first out-post of the vegetation of that mountain was a very distinct event. We found a well-marked dense patch, perhaps some 40 yards in diameter, of *Abolboda sceptrum, nov. sp.* OLIVER, [No. 312], a compact and dwarf, yucca-like plant—a rosette, perhaps a foot and half in diameter, of most acutely needle-pointed leaves. This plant appeared again in patches once or twice before we reached Roraima, and formed much of the turf, as it were, both of the savannah slope of the base of that mountain and also on the top. Wherever it appeared, it was a constant source of annoyance and of danger, not only to the naked feet of my Indian companions, but also to our own canvas-clad feet. Luckily, a rumour which in some way

spread among us that these rosettes of vegetable bayonets were poisonous, after causing some rather comic alarm, proved groundless. Where we first found the plant, as also on the sloping base of the mountain, it was out of flower, and though its withered flower-stems were extant, was even already seedless; but on the top we found it in full and striking flower. From the centre of the rosette of leaves rises a single stem, perhaps eighteen inches in height, crowned by a very regularly formed whorl of dependent yellow flowers. The general appearance—the *facies*, to use a term recognized by botanists—was remarkably like that of the yellow form of the Crown Imperial (*Fritillaria imperialis*). For the botanical description of this interesting plant, as indeed of all the other new plants of which I shall attempt to describe the *facies*, I must refer to the list carefully worked out at Kew. *

After passing the first station of *Abolboda sceptrum*, till we reached the actual foot of Roraima, at the bed of the Kookenaam river, we continued through a country over which, though it was still furnished chiefly with the ordinary savannah vegetation, were scattered a few new plants; and indeed as we advanced we met with an ever increasing number of these. Across this tract, about half-way between the station of *Abolboda* and the Kookenaam, flows the Arapoo river, which, falling down from Roraima, has its course marked in a

* It may be here mentioned that three volumes of admirable original sketches of British Guiana plants made under the direction of (Sir Robert?) Schomburgk exist in the Herbarium of the British Museum. Among these sketches are to be found many Roraima plants, and, among others, *Abolboda sceptrum*.

pronounced way by plants characteristic of that mountain, such as *Marcetia taxifolia* Tr. [No. 68], *Cassia Roraimæ*, Bth. [No. 71], *Dimorphandra macrostachya*, Bth. [No. 39], *Meissneria microlicioides* Ndn. [No. 174], *Calea ternifolia*, Oliver, *N. sp.* [No. 27]. To me the most interesting plant on this river was a very beautiful little slipper orchid *(Selenipedium Klotzschianum,)* Reich. fil. [No. 31], which grew in the moist gravel of the river bed, where the plants must frequently be under water. This plant we also found in great abundance on an island in the Cotinga river, another of the Roraima rivers, and on a small creek, called *Aroie*, a tributary of the Cotinga. Naturally the Arapoo river, as are its fellows flowing from Roraima, is an artery allowing of the dissemination of plants from that mountain.

At last we reached the Kookenaam river at the village of Teroota—at the base, that is, of Roraima. But even on, beyond the bed of this river, for some distance up the slope of the mountain, the tract of ordinary savannah vegetation still continues, its characteristic plants, however, ever becoming more and more penetrated by plants belonging to the Roraima flora, till the very distinctly marked zone of strictly Roraima vegetation is reached.

The course of the Kookenaam river, where it here flows through the tract of neutral vegetation—vegetation, that is, not yet deprived of ordinary savannah plants and not yet composed exclusively of Roraima plants—is, as was the course of the Arapoo river already described, —very well defined by the large number of Roraima plants clustering on its banks. Among these may be

mentioned various shrubs *Ilex Macoucoua*, Pers [No. 75], *Dipteryx reticulata*, Beth [No. 73], *Myrcia Roraimæ* Oliv, *N. sp.* [No. 74] and *M*, *Kegelianæ* Berg *aff* [No. 82]), which in places fringe the banks of this stream and are also characteristic of the upper, proper, flora of the mountain. Along the banks of this river, too, after its emergence from the mountain, grows, in the peaty soil at the water's edge, a very beautiful and sweet scented white orchid, *Aganisia alba*, Ridley *N. sp.* [No. 360] and, on the more rocky parts of the bank a very remarkable red passion flower [No. 84] with panicles of many pendent flowers, each panicle having the appearance, the facies, to use that ugly but convenient term again, of a spray of fuchsia blossom. * It was here too, in the deep cuttings made by the river and half filled up with huge blocks of stone which are now overgrown with gnarled trees and shrubs, that one of the most famous of all Roraima plants grows—*Cattleya Lawrenceana* Rch. fil. *N. sp.* [No. 80].

This Cattleya is doubtless the one collected by the SCHOMBURGK brothers, and enumerated by RICHARD SCHOMBURGK, as *C. pumila*; for it appears to be the only representative of this genus occurring on this side, at least of Roraima; and this was the only side visited by the SCHOMBURGKS. It grows, apparently not high up on the mountain, but on the gnarled tree trunks, close to the water, in the clefts through which the Kookenaam and some of its small tributary streams flow, at a height of about 3700 to 4000 feet above the sea. At the time of

* This passion flower is well figured in the Schomburgk drawings of which mention has already been made.

our visit, Mr. SIEDEL, an orchid collector, having set the Indians to work to collect this plant for him, I have seen these people, ten or twelve of them, come into camp, afternoon after afternoon, each laden with a basket, a good load for a man, full of these lovely plants, many of them then in full flower. One day, too, I myself, having gone down to the Kookenaam to bathe, just round the small pool I choose for that purpose, gathered two most glorious clumps of this orchid, the better of the two having five spikes of flower, of which one spike bore nine, and each of the others eight blossoms, in all forty-one of some of the largest and loveliest coloured Cattleya flowers ever seen, on a single small plant, the roots of which easily lay on my extended hand.*

Before now dealing with the plants actually of Roraima, it will be convenient to say a few further words as to the form of this south-eastern face of the montain.

From the bed of the Kookenaam at Teroota [3751 feet above sea level] the mountain slopes, somewhat gradually, though of course not evenly, upward, for a distance of about three miles, till a height of 5000 feet is attained. This last mentioned point is that to which a considerable number of the plants belonging to the ordinary savannah vegetation of Guiana ascend.† From this point the mountain rises, at first somewhat more abruptly and then again more gradually, so as to form,

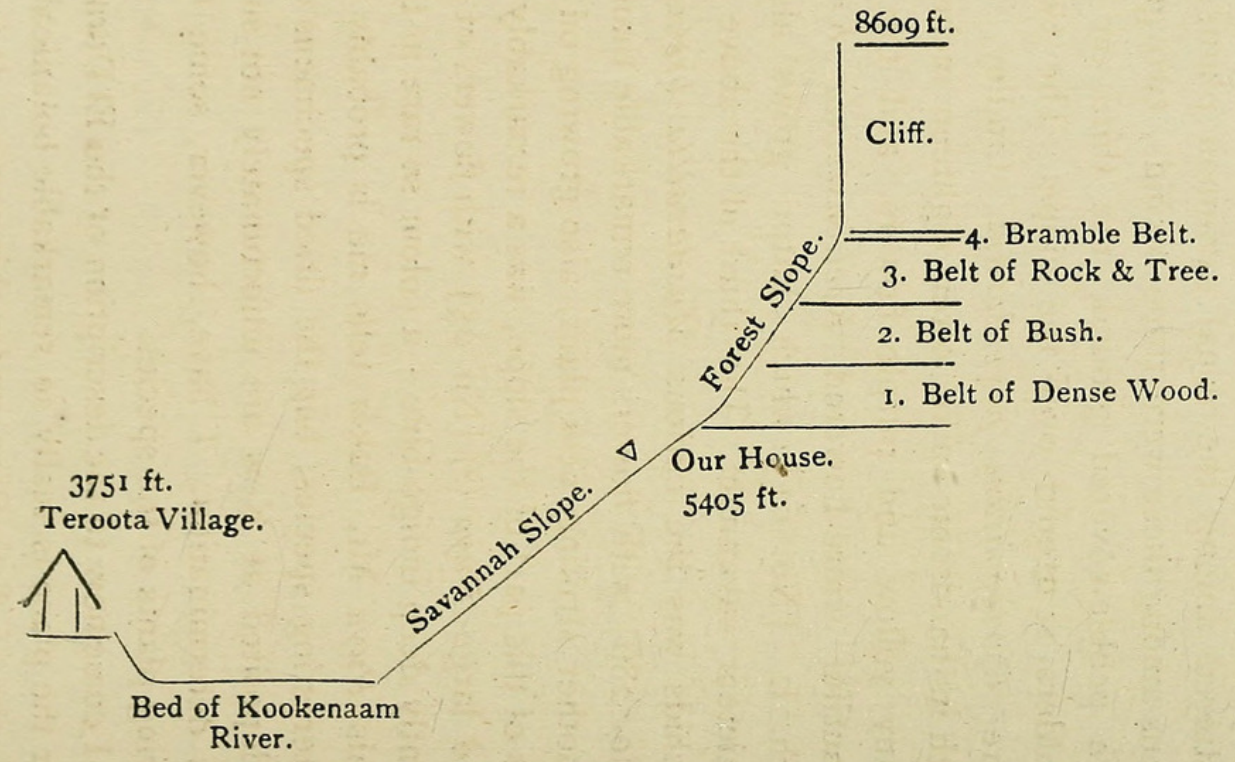
* Full description of the Cattleya have been given in the *Gardener's Chronicle,* Vol. 23, pp. 374-5. See also *Timehri*, Vol. 4 and Vol. 5.

† The most conspicuous of the few plants of the ordinary plain which ascend above this point are Sida linifolia, Polygala hygrophyla, H.B.K., P. longicaulis, H.B.K., P, variabilis, H B.K., Drosera communis, A. St. Hil, Pleroma Tibouchinum, Sr., Sipanea pratensis Aubl., Pectis elongata, H.B.K., Gnaphalium spicatum, Lam.

as it were, a terrace about midway up the slope. The upper level of this terrace, which lies at a height of about 5400 feet, is almost everywhere swampy, though here and there a few rocks crop out. This is the place so enthusiastically described by Dr. SCHOMBURGK, on account of the extraordinary richness of its vegetation, as a 'botanical El Dorado'; and it was here too, just within the forest which edges this swamp that we built our home and made our head-quarters. It is to this point too that the open savannah extends, for above, all is more or less densely forested. Behind this swamp, which caps, as it were, a terrace, half-way up the face of the mountain is a ravine; and again beyond this ravine, in which it must be remembered that the forest begins, the mountain slopes up very abruptly to a height of about 6,500 feet, to the base, that is: of the actual cliff. In the accompanying diagram (p. 170) all up to the ravine is distinguished as the savannah slope; all above, to the base of the cliff, as the forest slope. It should be noted that the forest slope is not uniformly clad with trees. The lower part is densely wooded, covered as it were, by dense jungle; next comes a belt of bush, rather than of jungle; while still higher, just under the cliff, the masses of rock which have fallen from above, lie like a moraine, on which are scattered, however, sparse trees, the low, wide-spreading branches of which interlock in a remarkable way.* The actual face of the cliff is, of course, bare; but wherever ledges run up for any distance these are often tree or bush clad; and

* This moraine-like part of the slope is curiously like the well-knowu 'Wistman's Wood' on Dartmoor.

Section to illustrate the character of the ground occurring on S.W. slope of Roraima.



the one ledge which runs right up to the top, the one by which we ascended, is bush-clad to a point about two-thirds up, then bush-less but plant-covered.

In the ascent from Teroota up to about 5000 feet, nearly up, that is, to the commencement of the El Dorado swamp, we met with many plants new to me scattered among the usual savannah plants. Conspicuous among these were three orchids, two growing on bare pebble-covered ground, the third on the huge boulders scattered over the slope. The two former were *Cyrtopodium parviflorum*, Lindley, [No. 55] with its handsome spike, often eighteen inches high, of many yellow and purple flowers, and the delicately beautiful white-flowered *Koellensteinia Kellneriana*, Rch. f., [No. 61] which latter grows also on the Kaieteur savannah. The third of the above mentioned orchids was the curious *Masdavallia brevis*, Rch. f., [No. 286] with flowers more remarkable than beautiful. Another striking new plant, also growing on the boulders of this part of the slope, was a remarkably handsome and large *Puya* (?) [No. 25] with flowers of a magnificently deep indigo-blue,—a colour so rare in the tropics. This *Puya* Mr. Baker tells me is probably a new and interesting species, but the dried specimens of it which I deposited at Kew are unfortunately not sufficient for its determination. I have, however, some fine young living plants of the species.

I come now to the description of the El Dorado swamp, for the place is really so remarkable botanically as to be worthy of distinction under this name. It is worth also another effort to give some picture of the appearance of the place. The swamp—botanists will understand that

the rather dismal suggestions of this word are often, as certainly in this case, undeserved—lies on a terrace midway up the mountain. Its surface is very uneven, and it is consequently much wetter in some parts than in others, its flatter parts and its hollows so saturated with wet that the foot of one who walks there sinks often up to the ankle, its higher parts islands, rarely of any great size, of dry ground scattered through the swamp. Often, too, from these dry islands considerable groups of rocks crop out and sometimes rise to a considerable height. In the wetter parts, the grass, which of course forms the main vegetation, is every where high, rank and coarse ; on the islands of drier ground the grass is finer and even turf-like; from the actual rocks grass is absent. Each of these two aspects of the swamp, wet ground and dry rocky island, presents a distinct vegetation, of which almost the only common feature is distinction from the vegetation outside this El Dorado.

Mingling and vying in height with the rank grass* of the wet parts, their flowers mingling with the blossoms of the grasses, are plants of wonderful beauty. The ever lovely, violet-flowered *Utricularia Humboldtii*, Schomburgk [No. 43], is there, growing, not as on the Kaieteur savannah as an epiphyte, but with independent roots in the ground; but of this I shall have more to say presently. The *Abolboda* is there too, in a form slightly larger and much less compact than is natural to it when growing on drier ground. The flag-leaved, yellow-

* The grasses chiefly noticed at this place were Paspalum stellatum, Flugge ; Panicum nervosum, Lam. ; Arundinella brasiliensis, Raddi.

flowered *Xyris setigera*, Oliv., *N. sp.*, [No. 62] is there. The small pink-flowered *Begonia tovarensis Kl.* [No. 141] is there. A very few plants of *Brocchinia cordylinoides.* Baker, just two or three single specimens, are there; but of this too, I shall have more to say presently. Various ferns are there, especially the magnificent Cycad-like *Lomaria Boryana.*

And many orchids are there; a 'lady's slipper' *Selenipedium Lindleyanum* Reich. fl. [No. 53] with huge branched flower stems, each bearing many blooms, the whole plant, flower leaf and stem alike, all velvety in texture, and of various shades of one colour, the colour of sunlight as it falls through young green beech-leaves; the beautiful *Zygopetalum Burkei*,* Reich. f. [No. 50], with flowers seeming like gigantic, pale coloured "bee orchises', (*Ophrys apifera*, Huds) but of far sweeter scent; in great abundance the rosy flowered *Pogonia parviflora* Reich. fi. [No. 115], which recalls in habit our English wild tulip (*Tulipa sylvestris*); and, to mention but one more among many, *Epidendrum elongatum*, Jacq. [No. 42], its stems varying in height from one to eight feet, its verbena-like clusters of flowers varying in colour in different plants, some pale yellow, some fawn colour, many pure rich pink, dark purple and even mauve. This last mentioned orchid, it may be noted in passing, is one of a group to which I shall presently refer.

The effect of the whole is of an Alpine meadow, coloured in early summer by innumerable flowers of the brightest and most varied tints.

* This is represented on the Organ mountain by Z. Mackaii.

If this tall vegetation be anywhere parted by the hand of the curious traveller, underneath it is seen a carpet of other, low growing, plants—*Pæpalanthus Schomburgkii*, Kl. [No. 33] and *P. flavescens*, K. [No. 60] *Drosera communis* A St. Hil. [No. 313], a pretty little orchid, *Spiranthes bifida*, Ridley *N. sp.* [No. 342], ferns, lycopodiums and sphagnum-like mosses.

One, perhaps the most remarkable, plant of the swamp has not yet been noticed. It is the South American pitcher-plant *Heliamphora nutans*, Benth [No. 258], which grows in wide-spreading, very dense tufts in the wettest places but where the grass happens not to be long. Its red veined pitcher-leaves, its delicate white flowers raised high on red tinted stems, its sturdy habit of growth, make it a pretty little picture wherever it grows. But it attains its full size and best development, not down here in this swamp, but up on the ledges on the cliff of Roraima and even on the top.

The vegetation of the drier, rocky patches is very different. A few shrubs of from four to eight feet in height and a very few stunted and gnarled trees are there; a few single specimens of the one Roraima palm *(Geonoma Appunniana)* which, as will presently be told, is much more abundant higher up; but more abundant are certain very dwarf shrubs of curiously alpine aspect, such as *Gaultheria cordifolia*, *H.B.K.* [No. 103] and various trailing plants, such as a black berry (*Rubus guyanensis*, Focke, [No. 106]), of which I shall have more to say hereafter, and a passion flower [No. 110] and a few orchids and ferns.

Of these orchids the most noteworthy is *Oncidium nigratum*, Lindley [No. 114], its delicately thin but wiry

and much-branched stems, five feet high or more, seeming to hold suspended in the air a crowd of innumerable, tiny, butterfly-like flowers of cream colour and black; but two others, *Zygopetalum Burkii*, and *Epidendron elongatum*, which we have already seen in rank luxuriance in the wetter parts of the swamp, grow also on these drier parts, and are here much reduced in general habit but with larger and brighter coloured flowers. Of the ferns the most striking are a beautifully delicately cut *Schizæa* (*S. dichotoma*, Sw. [No. 100]), and a very remarkable Gymnogramme (*G. elaphoglossoides*, Baker, *N. sp.* [No. 101 and 215]), of which more hereafter.

Again, the tiny coppices which are in the swamp, and the forest which bounds it—which forest, it must be remembered, covers on the other faces of the Roraima slope what is here swamp—are full of interesting trees. One, with vast numbers of large magnolia-like white flowers is *Moronobea intermedia* Engler *N. sp.* [No. 337], the new species already alluded to as very closely allied to a second new species, *M. Jenmani*, which occurs in corresponding circumstances on the Kaieteur savannah. Another abundant tree represents an entirely new genus *Crepinella gracilis*, Marchal [No. 192]; another is a new species of *Sciadophyllum* (*S. coriaceum*, Marchal, [No. 128]). Another common and strikingly beautiful tree is a variety of *Byrsonima crassifolia*, H.B.K. [No. 130], with leaves the under surfaces of which are tinted with so deep and rich a violet as to impart a very striking violet shade to the whole tree, even when it is seen from a distance. Under the shade of these, and the host of other trees, ground, shrubs and tree trunk alike are swathed in thick green mosses,

There too, but half clinging to the tree-trunks, are various species of *Psammisia* [Nos. 56 and 49], woody stemmed creepers, the innumerable drop-like crimson flowers of which, as they catch the tiny gleams of light striking down between the thick leaves of the forest roof, glow with intense colour. In these shady, moss-covered, quiet places, too, stand erect many tree ferns [Nos. 92, 270, 87, 37] and a very beautiful new aroid (*Anthurium roraimense*, N. E. Brown, *N. sp.* [No. 264]), its huge heart-shaped leaves and large arum-like flowers, of purest white, carried high on a slender but stiff stem. There, too, are innumerable ferns of wonderful interest, and many, but not showy orchids. Especially of the latter family many of those tiniest and most delicate species which if seen under a powerful magnifying glass, would rival the most showy, the most graceful of their kindred of our hot-houses.

We must pass now to the forest slope, which, as has been told, consists of three fairly distinct belts or zones, which I have called respectively, beginning from the lowest, the jungle belt, the bush belt and the belt of rock and tree.

The jungle is most densely interwoven of many tall shrubs or dwarf trees, which are yet more closely knit together by vast quantities of a climbing straggling bamboo (*Guadua* [No. 359]), of a Cyperaceous plant, *Cryptangium stellatum*, Boeckler [No. 357],) with rough, knife-edged leaves and tall weak stems; which support themselves on, and at the same time densely clothe, the shrubs among which the plant grows,* and of

* This is Schomburgk's Leiothamnus Elizabethæ.

gigantic (that is, gigantic in the size of the thickets, which from the communal habit of the species it forms) and handsome climbing fern (*Gleichenia pubescens H.B.K.* [No. 343]). Among the shrubs also are two palms; one, in vast quantities, a very stout and erect stemmed, large leaved *Geonoma,* before mentioned, (*G. Appuniana* [No. 382]); the other occurring only in a few scattered examples, a *Euterpe,* possibly *E. edulis* Martius [358] but, if so, in a most remarkably stunted and dwarfed form. It is worth noting here that, despite the reported specific abundance, by SCHOMBURGK and APPUN, of palms about Roraima, these are literally the only two plants of that family which I saw on the mountain. Under the shrubs forming this jungle the ground was everywhere swathed with mosses closely intermingled with innumerable ferns, especially filmy ferns; and this mossy covering reached up over the tree stems and branches everywhere but where the sunlight fell. Under the shade of these shrubs, too, in the darkness and damp, grew various high-drawn terrestrial orchids, pallid plants with inconspicuous and pale flowers, such as *Stenoptera viscosa* Reich. f. [No. 131].

Undoubtedly the most striking feature of the vegetation of this jungle belt was the marvellous abundance and variety of the ferns. Of these, two seem to require special mention here. One is the Gymnogramme [No. 181] already mentioned as occurring also on the rocks in the swamp, and which indeed was abundantly distributed from the swamp nearly to the top of the mountain. It will be further mentioned in connection with a closely allied species occurring on the top. The second fern to be distinguished represents a very remarkable new

genus, on which Mr. BAKER has dealt at some length in his report on the plants of the expedition. The genus he has called *Enterosora* [No. 184]; the species he has been good enough to gratify me by naming after my friend the late WILLIAM HUNTER CAMPBELL, LL.D. —a man who for very many reasons but especially for his constant endeavour to forward the scientific interests of the colony, deserved so well of the people of Guiana. It is perhaps worthy of mention that this plant so closely resembles in outward appearance a fern of entirely different genus (*Polypodium trifurcatum* L. [No 184]) that I collected and dried it in mistake for that plant. Were it possible to conceive that this resemblance could be of any benefit to the genus *Entosora*, it might be supposed that its very close resemblance to *Polypodium trifurcatum* was an instance of 'mimicry.'

Above the jungle belt comes the bush belt. Here the shrubs, much fewer in number, and so scattered over the ground as to leave wide intervening spaces, appeared to me generally of much the same species as in the lower belt. Here, however, as is not the case below, they are sufficiently distributed to be individually distinguishable. Among them the most prominent are a great number of species of *Psychotria* [Nos. 83, 145, 232, 185], and a very remarkable yellow-flowered Melasma [No. 210] *M. spathaceum*, Oliv. *N. sp.*, of which Professor OLIVER writes that the specimens supplied him are too imperfect to afford means of final determination whether this should not rather be regarded as the type of a new genus outside Melasma; and, in great abundance, a *Croton* (*C. surinamense* Muell. Arg. *aff.* [No. 235]). Here too, as below, but as is not the case in the jungle belt, occur a

large number of plants of *Brocchinia cordylinoides*, still in its small Roraima, not in its larger Kaieteur form, as well as great quantities of the huge *Stegolepis guyanensis*, Kl. [No. 338] the Iris-like plants of which being provided with a great abundance of slimy matter, made walking in parts where they grew densely most difficult. The *Brocchinia* too, grew in parts so densely that we had to walk, not on the ground but on the crowns of these plants, which, as we crushed them with our feet, poured from the axils of their leaves the remarkably abundant water which they retain—and very cold water it was—over our already cold feet. Nor must I omit to mention, though I purpose afterward to sum up my observations on the *Brocchinia* and on the various species of *Utricularia*, that in this bush belt a very few plants—I saw not more than three or four—of *Utricularia Humboldtii*, Schk. [No. 43], of the dark, Roraima form, were growing in the axils of the Brocchinia leaves, as at the Kaieteur.

Two other very interesting plants appeared to us first in this bush-belt, though we afterward found that they extended almost, if not quite up to the top of the mountain. One, Lisianthus (*L. macranthus aff.* [No 188]) was a large succulent-leaved herb, almost shrub-like, with very large, rich purple-crimson flowers centred with white—which would probably be a most valuable and gorgeous addition to our cultivated stove plants. The other was the most delicately beautiful, the most fairy-like, and at the same time for its size the most showy plant I ever saw. It was a new *Utricularia* which Professor OLIVER has kindly named also after WILLIAM HUNTER CAMPBELL. *U. Campbellianum*, Oliver, *N. sp.* [No. 187] grew among the very dwarfest mosses which

clung to the tree trunks and boughs. The plant—that is the root and leaves—is so tiny that it was almost impossible to detect it when not in flower. The erect stem, an inch or more high, is hair-like ; and on this is borne one, sometimes two, large and brilliant red flowers somewhat of the colour and size of the flowers of *Sophronitis grandiflora*.

One more feature of the bush-belt claims notice. It is that here the tree-ferns, occurring indeed in the lower jungle-belt but there crushed out of all form and lost in the too densely-packed, struggle of plants, are here, in the greater and freer space, able to develop their true form and beauty, and so rise with stout erect stems to bear far overhead their regularly-shaped, majestic crowns of thickly growing fronds.

Next, of the rock and tree-belt all that need be said is that the same species as in the lower belt seem to occur, but that these are here for some rather obscure reason, represented by larger and more developed individuals ; that the ferns, both the tree-ferns and the more dwarf species, and one of the palms *Genoma* [No. 382], become yet more abundant ; and that the mossy universal covering which I have already dwelt on, as occurring below, here becomes so immensely dense and all-pervading—the mosses are so deep on rock and ground, hang in such dense long masses from all trees and branches—as to produce on the mind of one who penetrates into that remarkable spot a wonderful and extraordinary effect of perfect and entire stillness, as though, all things being wrapped in so dense and soft a covering, all sound, and all possibility of sound, was stilled, deadened, and annihilated.

Just where the rock and tree belt meets the base of the cliff is a very narrow strip of quite distinct vegetation,—so distinct indeed that we might almost regard it as a distinct belt, which we might call the bramble belt.

The ground there is covered by a dense thicket of bramble bushes *Rubus guyanensis*, Focke, [No. 106], in general appearance altogether like our English blackberry bushes. Among this were large masses of the South American form, appearing very similar to our English form, of the common bracken (*Pteris aquilina*). There, too, were many little bushes of *Marcetia taxifolia* very strongly suggestive of English heath. There, too, was a flowering Laurestinus (*Viburnum glabratum*, H.B.K. No. 220) curiously like the familiar plant of our gardens. To me, after my long stay in the tropics, the whole scene suddenly seemed very home-like and pleasant. But the next minute as I turned in another direction, the illusion was dispelled by the sight of great thickets of palms (*Geonoma Appuniana*) and a few singly standing and very stately tree ferns.

Up from the bramble-belt, passing obliquely up the cliff face, ran the ledge by which we ascended to the top of Roraima. The lower part of the ledge, for perhaps two-thirds of its length, is wide, much broken and very uneven of surface. This part is somewhat irregularly bush-covered. Then the continuity of the ledge is suddenly almost broken by a deep ravine, a part of the rock having been worn away by a stream which falls on to it from the cliff above. The ravine thus made is almost bare of vegetation. Above, the ledge slopes somewhat steeply but evenly from the point where it re-commences to the top; and this part of it is cov-

ered by a dwarf vegetation never more than two or three feet high.

The shrubs on the part of the ledge below the ravine seem to be generally much the same as on the forest slope ; but among these a few new ones appear. Among the latter were the very beautiful *Drimys granatensis* Mutis [No. 242] with its very beautiful white flowers, like pendent wood-anemones ; a new and beautiful Microlicia (*Microlicia bryanthoides*, Oliver, *N. sp.* [No. 239]) and several more species of *Psychotria* [Nos. 191, 291]. There, too, was an abundance of the Lisianthus [No. 188], already mentioned, and of *Utricularia Campbellianum*.

At the bottom of the ravine into which the stream falls the rocks are bare and leafless but for a large number of a pretty white flowered *Myrtus* (*M. stenophylla*, Oliver, *N. sp.* [No. 324]) which, met with no where else, were growing abundantly in the spray of the falling water.

But beyond this ravine, on the upper part of the ledge, the true botanical paradise begins. The main vegetation is formed of *Brocchinia cordylinoides*, BAKER, (in the axils of the leaves of which here grows *Utricularia Humboldtii*), *Abolboda sceptrum*, Oliver, and *Stegolepis guyanensis*, Kl. [No. 338]. But among these were wonderful numbers of plants entirely new to me and of most striking beauty. Many of these were shrubby, but of so diminutive a character as to be strictly Alpine. Of these by far the most beautiful was a wonderful heath-like plant, with dark green-leaved stems, stout and sturdy but yet seeming almost over-weighted by their great load of

intensely vivid crimson star-like flowers. This plant [No. 308.] Professor OLIVER has identified as a *Ledothamnus* [No. 308], possibly *L. guyanensis*, Meissner, var. *minor*; but of much more slender form than is attributed to that plant in Martius Fl. Bras. VII. 172.

Another shrublet, in character recalling the "Alpine Rose" (*Rhododendron ferrugineum*) bore even more disproportionately large flowers, of an exquisite pink colour. It was a *Befaria*, approaching *B. resinosæ*, Mutis [No. 310]. Other tiny shrubs there were a white, feather-flowered Weinmannia (*W. glabra*, L. f. var ?) [No. 244], a myrtle (*M.* n. sp. aff. *M. myricoidi*, H.B.K. [No. 189]) yet another species of *Psychotria*, (*P. im Thurniana*, Oliver, n. sp. [No. 163]); a *Baccharis* (*B. Vitis-Idæa*, Oliver, n. sp. [No. 241]); and a *Vaccinium* (*V. floribundum ?* H.B.K. [No. 329]). On most of these tiny shrubs was growing an appropriately tiny mistletoe, (*Phoradendron Roraimæ*, Oliver, *N. sp.* [No. 323],) a miniature of our English plant. Among all these, many other interesting plants occurred. There grew, in far greater luxuriance and size than below, the pitcher plant, *Heliamphora nutans*, Benth. [No. 257]. There grew great masses of two species of Xyris (*X. Fontanisiana*, Kth. and *X. witsenoides*, Oliver, *N. sp.* [No. 240],) the latter very striking and curious by reason of the Witsenia-like habit of their dark green-leaved stems, with pretty star-like yellow flowers. There grew a plant with a flower which, because of its form and colour, I at first sight mistook for a Frittilaria, like a 'snake's head,' (*F. meleagris*); but it was a new *Lisianthus*, which Professor OLIVER has named *L. im Thurnianus*, Oliver, *N. sp.* [No. 306]. There grew many small, but

pretty and bright-coloured orchids—a remarkable number of them new species of *Epidendrum* (*E. montigenum,* Ridley, *N. sp.* [No. 322] and another [No. 304]). And there grew a Scirpus of a new genus, named by Mr RIDLEY *Everardia* (*E. montana,* Ridley [No. 335]).

So the vegetation of the ledge continued to the top, and indeed actually over, on to the top.

The general effect of the vegetation of Roraima, fitly rivalling in this respect the marvellously strange geological aspect of the place, is so strange as to be very difficult of sufficiently emphatic description. It occupies more or less wide tracts, generally almost level, between the bare flat rocks and the groups of piled rocks which occupy the greater part of the plateau. In such places it forms a dense carpet of vegetation, which is generally but a few inches in height, except where from its general level rise a few scattered individuals of the one shrub of any conspicuous height (*Bonnetia roraimæ*, Oliver *N. sp.* [330],) —and that was never more than from 30 to 40 inches in height—or by the many and very remarkable flower-stems of *Abolboda sceptrum*, Oliver, [312], which, to my great delight, at that height bore its beautiful blooms, the appearance of which I have already described. Through this carpet of vegetation ran many small streams ; and even elsewhere much water everywhere saturated the turf. A very few plants also grew in the crevices of the piled rocks, which otherwise were bare of vegetation.

The chief constituents of this turf-like vegetation were vast quantities of a new species of *Pæpalanthus (P. Roraimæ*, Oliver, *N. sp.* [No. 294]), and great masses of sphagnum-like mosses. In the latter grew,—in such

abundance as to redden the ground—the pretty little sundew, (*Drosera communis* [313]). Groups of very luxuriant pitcher-plants (*Heliamphora*) were there also. Great quantities of tiny shrubs of Alpine character, interwove their branches with each other and with the mosses. Among these were *Weinmannia guyanensis*, Kl. [327], *Marcetia juniperina*, D.C. [No. 319], *Psychotria concinna*, Oliver *N. sp. Baccharis* [No. 241], *Ledothamnus* [No. 308], *Befaria* [No. 310], *Vaccinium* [Nos. 329, 326], *Pernettya* [No. 333 ex parte], and *Gaultheria* [No. 332]. The small *Epidendrums*, as on the ledge, were here too, as was the tiny mistletoe (*Phoradendron* [No. 323], and the fritillary-like Lisianthus [No. 306].

A beautiful *Tofieldia* (*T. Schomburgkiana*, Oliver, *N. sp.* [297]) and, somewhat similar, *Nietneria corymbosa*, [298], with large yellow flowers were conspicuous.

In the crevices of the rocks the vegetation was different. There was a very beautiful *Utricularia* (*U. montana*, Jacq. *aff.* [No. 293],) larger and deeper in colour, but slightly less graceful than *U. Campbellianum*. And there were three species of ferns. One of these latter was a very stunted form of *Lindsaya stricta*, Dry., [No. 301], which in its ordinary form is common in many parts of Guiana. The other two were absolutely new—one a *Hymenophyllum* which Mr. Baker has named *H. dejectum*, Baker, *N. sp.* [No. 318], the other a Gymnogramme, *G. cyclophylla*, Baker, *N. sp.* [No. 295] a second species of the same group of this genus to which belongs *G. elaphoglossoides*, Baker, *N. sp.* [No. 101,215], found on the lower slopes of Roraima. Only one other species of this very distinct group is known, and has been found in the Amazon valley.

I have now briefly noticed the most striking plants with which we met on Roraima; but before closing this paper, there are one or two points which I wish finally to set down in order.

First as to *Brocchinia cordylinoides*, Baker. This is only known to occur on the Kaieteur savannah and on Roraima, but in the latter place apparently only above a height of 5500 feet. There is, too, a remarkable difference of vigour in the habit of the plant at these two places respectively. After seeing a large number of individuals of the plant at both places it is obvious that at the Kaieteur it attains a much greater size and forms a much taller stem; and, if I may judge from the comparative abundance or scarcity of flower stalks it seems to flower much more freely at the Kaieteur than on Roraima. A possible explanation of some of these facts seems to be that the plant belongs to the kind of position and the circumstances that it finds on Roraima; that the most important of these circumstances of its existence is an atmosphere like that of Roraima or the Kaieteur, so supersaturated with damp as to effect the constant replenishment of the large quantity of water retained in the leaf-axils of the plant; and that the plant, having found its way to the Kaieteur, which though much below the proper sea-level is atmospherically so peculiarly suited for it that it has taken root there, and in its new surroundings of higher temperature has developed a new vigour. Lastly, as regards this plant, I cannot refrain from once more alluding to its possible, even probable, distribution in the other widely scattered distinct areas already enumerated.

Closely connected with the *Brocchinia* is *Utricularia*

Humboldtii. Like the *Brocchinia* this plant grows both at the Kaieteur and on Roraima ; but at the former station it apparently *always* grows floating in the water retained in the leaf-axils of the Brocchinia, while on Roraima it grows abundantly with its roots in the ground and only very rarely in the close association with the *Brocchinia*. The Roraima plant is, moreover, far more beautiful—its flowers are of a far more intense colour—than is the Kaieteur plant. This latter circumstance is possibly greatly due to the greater vigour which the plant obtains when its roots are in the ground. I have already alluded to the occurrence of a very similar *Utricularia* on the Organ Mountains associated with a huge bromeliad just as it is at the Kaieteur with the *Brocchinia*.

Next, the two other large-flowered species of *Utricularia* from Roraima claim notice. *U. Campbellianum* has already been described. It occurs abundantly, but apparently only on the forest slope and for some distance from this up the cliff. It is new to science. The other species *U. montanæ* Jacq. *aff.* [No. 293] appears to occur only in crevices in the rocks on the summit. It is not new to science, having been previously recorded from Guiana, several of the West India islands, and other parts of Tropical America. The two species though somewhat alike in general character, are, at a second glance, evidently very distinct. *U. Campbellianum* is altogether a more delicate plant, its leaves are much smaller, rounder, and its stems are shorter ; its bladders are disc-shaped. The other species *U. montanæ* Jacq. *aff.* is altogether a stouter plant with longer-stalked, strap-shaped leaves, and with spindle-shaped bladders.

To one other set of plants I should here like to call

attention. These are represented from among the plants collected during the Roraima expedition by two species of Epidendrum (*E. Schomburgkii,* Lindley [No. 13] and *E. elongatum,* Jacq. [No. 427]). These seem to me to be forms, from the bare, rocky ground of the interior of the country, which correspond more or less closely with three, (in a fresh state evidently very distinct,) forms, dried herbarium specimens of which have all been classed under the one name of *E. imatophyllum,* and all of which occur on trees near the coast. Of these coast forms, the most distinct is a small almost *constantly* bifloral form which occurs on trees overhanging the brackish water at the estuaries of the rivers; another, occurring on trees slightly higher up the rivers, is in general facies and colour very similar to the typical E. Schomburgkii; and the third, occurring in similar positions, but more sparingly, more nearly approaches in facies E. elongatum, but is constantly of a peculiar scarlet colour. The two last mentioned forms, unlike any of the other, are invariably associated with ants, either because these creatures prefer to make their nests in the roots of the plants, or because the seeds of the plants find their most suitable nidus, and germinate, in the ants' nest.

List and Description of Plants.

242. Drimys granatensis, Mutis. Ledge.

40. Guatteria. In the absence of fruit may be referred to G. Ouregou, Dun. Arapoo R.

258. Heliamphora nutans, Benth. 5,400 ft. and Top.

96, 151. Sauvagesia erecta, L. forma. 5,400 ft.

309. **Leitgebia im Thurniana**, Oliv. sp. nov.—Floribus distincte pedicellatis, coronæ squamulis oblongo-spathulatis antheris æquilongis v. longioribus, Roraima: ledge and summit. *E. F. im Thurn.* Caulis plus minus ramosus pennæ corvinæ crassitie. Folia imbricata coriacea oblanceolata acutiuscula, apicem versus utrinque 2-3 crenato-denticulata, glabra, oblique nervosa $\frac{1}{3}$ poll. longa: stipulæ scariosæ fimbriatæ. Flores ad apices ramulorum, $\frac{1}{2}$-$\frac{2}{3}$ poll. diam., pedicello $\frac{1}{3}$ poll. longo 2-3 bracteolato, bracteolis anguste linearibus stipulatis, stipulis lineari-subulatis longe ciliatis. Sepala lineari-lanceolata acuta rigidiuscula $\frac{1}{4}$ poll. longa. Petala obovata integra $\frac{1}{3}$ poll. longa. Corona basi filamentis coalita, squamulis 5 obtusis coloratis. Ovarium glabrum in stylum attenuatum.

Allied to L. guianensis, Eichl., but much more slender, with the flowers distinctly pedicellate, and the coronal squamæ equal to or overtopping the anthers.

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26. Polygala hygrophila, H. B. K. Arapoo R.

97. „ longicaulis, H. B. K. 5,400 ft.

252. „ an P. variabilis, H. B. K. var? „

79. Qualea Schomburgkiana, Warm? By Teroota.

337. **Moronobea intermedia**, Engl. sp. nov.—Ramulorum internodiis brevibus foliis crassis valde coriaceis concoloribus obovato-oblongis, in petiolum brevem canaliculatum angustatis, nervis lateralibus numerosis patentibus subtus paullum prominulis; floribus breviter pedicellatis sepalis 5 suborbicularibus cinerascentibus; petalis quam sepala arcsexico longioribus, staminum phalangibus 5-andris, superne tantum leviter spiraliter tortis petala fere æquantibus; ovario oblongo ovoideo in stylum duplo breviorem stigmate 5-fido coronatum attenuato. Roraima: *E. F. im Thurn.*

Omnino intermedia inter Moronobeam ripariam et Moronobeam Jenmani, a priori non nisi foliis paullo majoribus et nervis minus prominulis, ab altera floribus duplos minoribus, ab utraque phalangibus androecii minus torti diversa. Engler.

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72. Marcgravia coriacea, V. ? vel umbellata L. (imperfect) Near House 5,400 ft.

11. Bonnetia sessilis Bth. Between Ireng and Cotinga R. label misplaced or missing B. paniculata, Spr. ?

330. **Bonnetia Roraimæ**, Oliv. sp. nov.—Foliis coriaceis parvis oblanceolatis v. obovato-oblongis obtusiusculis apicem versus obscure denticulatis eveniis brevissime crassiuscule petiolatis, floribus ad apices ramulorum sessilibus bracteatis, sepalis late ellipticis obtusis breviter apiculatis ciliolatis, petalis calyce longioribus cuneato-obovatis truncatis v. leviter emarginatis, filamentis apetalis liberis brevibus, basi in phalangibus 5 coalitis, antheris obovata-turbinatis emarginatis, ovario in stylum crassiusculum apice 3-fidum angustato. Summit of Roraima (*E. F. im Thurn*. Folia conferta imbricata 4-7 lin. longa. Flores $\frac{1}{3}$-$\frac{1}{2}$ poll. diam.

A very distinct species of which our material is rather imperfect.

8. Mahurea exstipulata, Bth — Aroie Creek.

288. Ternstrœmiacea ? (Inadequate) — Path to upper Savannah.

22. Sida linifolia. Cav. — Arapoo R.

130. Byrsonima crassifolia, H.B.K. var. ? — nr. House.

136. Tetrapterys ? (no fruit) — nr. House.

255. **Tetrapterys rhodopteron**, Oliv. sp. nov.—Ramulis appresse sericeis, foliis petiolatis obovata-v. oblanceolato-ellipticis breviter apiculatis basi cuneatis utrinque tomentello-pubescentibus supra glabrescentibus, racemis folio brevioribus sericeis, bracteis brevissimis ovatis bracteolatis medio pedicelli insertis obovatis v. late ellipticis bractea majoribus, calyce 10-glanduloso sericeo, samaræ alis lateralibus a basi divaricatis coriaceis nervosis glabris rubescentibus obtusis integris v. interdum inæqualiter dentatis. Roraima: *E. F. im Thurn*.

Folia 2½-3 poll. longa, 1$\frac{1}{6}$-1½ poll. lata; petiolus ¼-½ poll.

longus. Bracteolæ geminatæ $\frac{1}{10}$-$\frac{1}{8}$ poll. longæ. Samara *alis longioribus* $\frac{1}{2}$ poll. longis.

211. **Revenia ruellioides**, Oliv. sp. nov.—Ramulis appresse pubescentibus foliis unifoliolatis petiolatis ovalibus utrinque attenuatis v. basi obtusis apice obtusiusculis nervo medio utrinque cum petiolo appresse pubescente, pedunculis in axillis superioribus 2 vel 1 floribus, sepalis 2 exterioribus majoribus ovatis v. oblongo-ovatis, petalis longe coalitis, tubo corollæ calyce 4-5 plo longiore leviter curvato, lobis ovatis lanceolatisve, antheris 2 fertilibus basi appendiculatis. Roraima, Upper Slope: *E. F. im Thurn.*

Folia $1\frac{1}{4}$-$2\frac{1}{2}$ poll. longa, 5-12 lin. lata; nervis subtus obliquis prominulis: petiolo 2-3 lin longo. Flores 1-$1\frac{1}{4}$ poll. longi; corolla sericea. Calyx sepalis exterioribus $\frac{1}{5}$-$\frac{1}{4}$ poll. longis. Antheræ appendicibus brevibus reflexis obtusis obovatis v. truncatis.

Closely simulating some Acanthacea, with its opposite simple (unifoliolate) leaves and long curved corolla-tube sheathed at the base by the unequal sepals. The reflexed somewhat fleshy appendage at the base of the perfect anthers, has not I believe been observed in the two other described species of the genus.

15. Fruiting specimen leafless of a Pœcilandra? and flowering specimen of Gomphia guyanensis (Ouratea, Aubl)? Arapoo R.

75. Ilex Macoucoua, Pers, forma? 3,500 ft.

107, 331. Ilex retusa, Kl. 5,400 ft. and Ledge.

35, Cyrilla antillana, Michx. Arapoo R.

334. „ „ var. brevifolia. Top.

21. Rhynchosia Schomburgkii, Bth. Arapoo R.

67. **Swartzia**, sp. nov. 5,000 ft.

73. Dipteryx reticulata, Bth. ? (Type is too imperfect to be quite sure). Kookenaam R.

71. Cassia Roraimæ, Bth. Arapoo R.

39. Dimorphandra macrostachya Bth. Arapoo Valley.

106. Rubus guyanensis, Focke (ex descr.) "R. Schomburgkü, Kl." base of cliff.

244, 321. Weinmannia glabra, L.f. var.? near W. humilis, Engl, but with larger pedicels. Ledge and Top.

327. Weinmannia guianensis, Kl. Top.

313. Drosera communis, A. St. Hil. var? Top.

324. **Myrtus stenophylla**, Oliv. sp. nov.—Ramosissima, ramulis ultimis gracilibus papilloso-scabridis, foliis patenti-recurvis anguste ovalibus v. lineari-oblongis acutiusculis basi in petiolum angustatis glabris, pedunculis folio brevioribus unifloris axillaribus recurvis apice bibracteolatis, bracteolis linearibus calycis tubo obovoideo obsolete puberulo longioribus, lobis calycis oblongo-lanceolatis obtusiusculis tubo subæqualibus petalis dimidio brevioribus, ovario 3-loculare, ovula in loculis plurima, bacca subglobosa, seminibus reniformibus. Fall on ledge of Roraima, 7,500 ft. *E. F. im Thurn.* Folia circ. $\frac{1}{3}$ poll. longa, $\frac{2}{3}$-$\frac{3}{4}$ lin lata; petiolus, lin. longus.

189. **Myrtus**, sp. nov. aff. M. myricoidi, H.B.K. Top and upper slope.

74. **Myrcia** (Aulomyrcia) **Roraimæ**, Oliv. sp. nov.—Ramulis teretibus pilosulo-puberulis glabrescentibus cineraceis, foliis pallidis obovato-ellipticis v. late oblanceolatis obtusis basi cuneatis subtus in nervo obsolete pilosulo, suprademum nitentibus, paniculis pedunculatis axillaribus et subterminalibus, pedunculis pauce pilosulis folio brevioribus v. subæquilongis, floribus breviter pedicellatis, pedicellis pubescentibus calycis tubo turbinate glabro sæpius brevioribus, lobis calycinis brevibus late rotundatis. Roraima 3,500 ft. *E. F. im Thurn.*

Folia 1-1$\frac{1}{2}$ poll. longa, $\frac{1}{2}$-$\frac{3}{4}$ poll. longa, vernatione supra parce pilosula; petiolus 1$\frac{1}{2}$-2 lin. longus. Paniculæ cymosæ 1$\frac{1}{2}$-2 poll. longæ.

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82. Myrcia aff. M. Kegelianæ, Berg. 3500 ft.

68. Marcetia taxifolia, D. C. (Tr.) an M. cordigera, D. C.? folia ovato basi cordata marginibus late recurvis.—5,400 ft.

174. Meissneria microlicioides, Ndn. M. cordifolia, Bth. Siphanthera (Cogn)—5,400 ft.

239. **Microlicia bryanthoides**, Oliv. sp. nov.—Fruticulosa, ut videtur fastigiatim ramosa glabra, ramulis ultimis foliiferis acuto tetragonis internodiis folio 3-6 plo. brevioribus, foliis paucis lineari-vel oblongoovalibus obtusiusculis brevissime

petiolatis, floribus solitariis breviter pedicellatis ad apices ramulorum 5-meris, lobis calycinis ovato-lanceolatis tubo fere æquilongis persistentibus, antheris majoribus connectivo producto subæquilongis. Roraima; Ledge 6,500 feet *E. F. im Thurn.* Folia $\frac{1}{5}$-$\frac{1}{4}$ poll. longa, $\frac{1}{15}$ poll lata. Flores $\frac{1}{2}$-$\frac{2}{3}$ poll diam. Capsula calyce persistente vestita $\frac{1}{8}$ poll longa, lobis calycis (temp. fruct.) erectis deltoideo-subulatis rigidis.

59. Pterolepis lasiophylla, Tr. (but scarcely Pterolepis ?)

20. Pleroma Tibouchinum. Tr. (Tibouchina aspera, Aubl.) Arapoo R.

319. Marcetia juniperina, D. C. Top.

89. Centronia crassiramis, Tr. 5,750 feet.

305, 216. Monochætum Bonplandii? Ndn. Upper slope and top.

277. (Facies Miconiæ pauperulæ, Ndn. ?) Oxymeris ? aff. Oglanduliferæ, Tr. Path to Upper Savannah. Closely resembles the above Miconia; but our specimen is not good.

256. Miconia Fothergilla, Ndn. House.

223. „ sp. (inadequate) Path.

30, 70. „ decussata, Don. Arapoo R.

222. Meriania ? aff. M. sclerophyllæ Tr (imperfect). Forest slope 6,000 feet.

2. Cuphea gracilis, H. B. K. var. media.

4. Passiflora fœtida, L. var Konkarmo.

84. **Passiflora**, sp. E. sect. Murucuja (ut videtur). Kookenaam. R.

Folia petiolata, petiolis pollicaribus apice utroque latere glandula majuscula circulari præditis, laminis $4\frac{1}{2}$-5 poll. long. $2\frac{1}{2}$ poll. lat. glabris subtus glaucescentibus subcoriaceis late ovato-oblongis acutis basi rotundatis, raro arcuatim nervosis. Pedunculi . . . foliis subæquilongi apice racemosi . . . . Alabastra cylindrato-oblonga acutiuscula. Floris tubus elongatus obconicus, sepala petalaque ut videtur brevia oblonga obtusa vel rotundata. Corona faucialis e ligulis petaloideis brevibus constans, gynandrophorum gracile . . . . . .

110. **Passiflora** sp. E. sectione Astrophea ? Fruticosa cirrosa. Folia breve-petiolata petiolis sub $\frac{1}{2}$ poll. long, laminis $2\frac{1}{4}$ poll. long, $1\frac{1}{2}$ poll. lat. coriaceis glabris raro arcuatim

venosis oblongis basi apiceque rotundatis . . . . Cirri simplices . . . Bracteæ . . . . Alabastra oblongai obtusa. Floris tubus brevis tubulato-campanulatus bas haud intrusus, Sepala 5-6 lin. long. oblonga obtusa navicularia extus tomentosa intus maculis linearibus purpureis, verrucisque albidis notatis. Petala sepalis conforma parum breviora tenuiora membranacea, albida maculis purpureis minimis crebris obsita. Corona faucialis biserialis; series extima e ligulis petalis æquilongis petaloideis, purpureo-maculatis dolabri-formibus, apice obliquis et in acumen longiusculum tortum prolatis; series intima e folis numerosis procedentibus dimideo brevibus, capitatellis. Corona mediana e tubo versus medium assurgens basi membranacea, apice in fila brevia divisa. Corona infra mediana e tubo versus basin emergens annularis, sub carnosa margine deflexa. Tubi facies interna, inter coronas, processibus parvis membranaceis ut videtur dense obsessa. . . . . Gynandrophorum basi ut videtur quinquangulum, angulis anguste alatis, supra medium tumidum ibique puberulum. Antheræ oblongæ obtusæ flavidæ. Ovarium ut videtur oblongum angulatum longitudinaliter costatum puberulum. Stigmata majiuscula reniformia. Our House.

141. Begonia tovarensis, Kl. var ? fructibus breviter alatis. House.

128. 5,750 feet.

162. Upper slope.

Crepinella, E. Marchal, nov. gen.—Flores hermaphroditi. Calycis margo brevis obsolete 4-dentatus. Petala 4-valvata. Stamina tot quot petala, subdico epigyno explanato superne in stylum suicatum abeunte inserta, filamentis brevibus et antheris ovatis. Ovarium 1-loculare, 1-ovulatum, ovulo pendulo. Fructus ignotus. Frutex (?) glaber. Folia digitata. Flores in umbellas compositas terminales digesti. Bracteæ parvæ squamiformes. Pedicelli sub flore continui.

Notwithstanding the absence of fruit the genus Crepinella is very different from other Araliaceæ with 1-celled, 1-ovuled ovary differing from Eremopanax, Baillon, Cuphocarpus, Dene & Naud, and Mastixia, Blume, in its digitate leaves and umbellate tetramerous flowers. Dedicated to Mons. Crepin, Director of the Botanic Gardens, Brussels.

162. **Crepinella gracilis**, E. Marchal. nov. sp. Foliis 5-natis petioli sulcato basi abrupte dilatato, foliolis breviter petiolulatis, ovato-elliptices, apice obtusis vel marginatis, basi acutiusculis, margine integerrimis sinu revolutis, pergamaceis, costa infra prominente, umbellulis longiuscule pedunculatis, 8-12 floris, pedunculo gracili profunde sulcato superne incrassato; floribus minutis pedicello basi bracteolato 4-poll brevioribus, calycis tubo obconico, 8 sulcato, corolla hemisphærica acutiuscula sulcata, petalis ellipticis, apice leviter incrassatis incurvis, nervia tenui extus impressa notatis• stylo gracili, latitudinem disci vix æquante fructu.—Roraima: *E. F. im Thurn.*

Rami supremi graciles. Petiolus communis circ. 5 cm. longus. Petioluli 6-10 mill longi. Foliola 4-5 cm. longa atque 3 cm. lata. Pedicelli 5-7 mill. longi.

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128. **Sciadophyllum coriaceum**, E. Marchal. nov. sp. —Inflorescentiis foliisque subtus tomento adpresso subferrugineo demum hinc inde deterso vestitis, foliis digitatis, 5-7-natis, foliolis ellipticis, apice rotundatis v. sæpius leviter emarginatis, basi acutiusculis margine integerrimis anguste revolutis crassiusculis, coriaceis, supra denudatis, reticulo nervorum densiusculo infra valde prominente, floribus in umbellas duas compositas superpositasque digestis, umbellulis numerosis, 9-12 floris, pedunculo compresso elongato superne dilatato, radiis filiformibus basi bracteolatis, calycis limbo minute 5 dentato, corolla hemisphærica acutiuscula, petalis apice cohærentibus demum a basi secedentibus staminum filamentis brevibus, stylis in unum sulcatum 5 fidum latitudinem disci epigyni vix æquantem concretis fructum. Roraima: *E. F. im Thurn.*

Allied to Sciadophyllum japurense Mart. et Zuce, but differing in leaves inflorescence and style. Arbor. Rami supremi 2 cm. crassi, petiolus communis 20 cm. longi. Petioli 24 cm. longi. Foliola 11-13 cm. longa atque 4-5 cm. lata. Pedicelli 5-8 mill. longi.

220. Viburnum glabratum, H.B.K. base of cliff.

134. Coccocypselum canescens W. var House.

6. Kotchubæa (Synisvon Schomburgkianum Baill) Aroie Creek.

69. Declieuxia chiococcoides, H.B.K. House.
29. Sipanea pratensis, Aubl Arapoo R.
135. Cephaëlis axillaris, ? Sw. House: Upper slope.
83. Peychotria inundata, Bth. ? 3,500 feet.
145. „ crassa, Bth. ? House.
232. „ „ Upper slope.
185. Psychotria sp. (=Schomburgk 1018 B, and Appun, 1103). Upper slope.

163, 320. **Psychotria im Thurniana**, Oliv. sp. nov.—Glaberrima; ramulis gracilibus internodiis rectis subteretibus foliis sub-sessilibus anguste vel lineari-lanceolatis acuminatis basi obtusissimis subcordatisve, costa prominula, nervis secundariis utrinque circ. 10-15 incurvis prominulis nervo marginali attingentibus cum venulis intermediis, stipulis basi connatis deltoideo-subulatis brevibus, cymis terminalibus pedunculatis 9-15 floris laxiusculis bracteis obsoletis, calycis limbo 4-dentato, dentibus deltoideis corollæ tubo cylindrico limbo 2-plo longiore. Roraima. Upper Slope and Ledge, 7,000 feet. *E. F. im Thurn.* Folia tenuiter coriacea flavescentia $1\frac{3}{4}$-$2\frac{1}{4}$ poll. longa, $\frac{1}{2}$-$\frac{2}{3}$ poll. lata. Flores 2-$2\frac{1}{2}$ lin. longa; corollæ limbus 2-$2\frac{1}{2}$ lim. diam., lobis ovatis obtusis tubo intus piloso. Ovarium biloculare.

191, 214. Psychotria sp. (Imperfect). Upper Slope and Our Path.
291. „ ? sp. Path to Upper Savannah.

Psychotria concinna, Oliv. sp. nov.—Glaberrima, ramulis gracilibus atropurpureis, foliis petiolatis parvis coriaceis ovalibus acutis v. acutiusculis supra costa subprominula nervis lateralibus obsoletis, subtus costa prominente nervis secundariis utroque latere 7-10 prominulis patentim curvatis nervo marginali attingentibus, stipulis liberis (utrinque geminatis) e basi crassiuscula erectis subulatis rigidiusculis, floribus in cymis pauci-floris parvis breviter pedunculatis terminalibus dispositis, pedicellis brevissimis, calycis lobis minutis ovatis, corollæ tubo recto gracili glabro intus medium versus pilosulo superne leviter dilatato, lobis brevibus ovatis. Roraima: Ledge 6,500 feet and summit. *E. F. im Thurn.* No. missing. Folia 7-12 lin longa, $\frac{1}{4}$-$\frac{1}{3}$ poll lata: petiolus 1-$1\frac{1}{2}$ lin. longa Cymæ 5-8 floræ. Corolla 6-7 lin. longa (lobi 1 lin.)

66. Palicourea riparia? Bth. forma angustifolia.
85. ,, rigida, Kth.
90. Relbunium (Schombk 646/984 B.) 5,400 ft.
23. Eupatorium amygdalinum, D. C. Arapoo R.
Eupatorium sp.? not identified. No label.
95. Eupatorium conyzoides, V. var. 5,400 ft.
91. Mikania pannosa, Baker 5,400 ft.
16. Pectis elongata, H. B. K. Wai-ireng R.

241, 325. **Baccharis Vitis-Ideæa,** Oliv. sp. nov.—Ramulis ultimis puberulis foliis crebris tenuiter coriaceis oblanceolatis obtusis apice 1-3-5-mucronatis, in petiolum basi cuneatim angustatis glabris, capitulis companulato-hemisphæricis 15-20-floris in corymbis terminalibus sæpius sessilibus dispositis, involucri bracteis pauciseriatis, interioribus (in cap ♀) scariosis anguste lineari-oblongis deciduis, pappo albido. Roraima, Ledge, 7,300 ft. and summit. *E. F. im Thurn.*

Folia ½-1 poll. longa, 3-4½ lin. lata, capitula ⅓-¼ poll. diam.; bracteis exterioribus ovatis v. ovato-lanceolatis plusminus scariosis margine apicem versus sæpe denticulatis v. minuto-fimbriatis (in invol ♂ ut videtur obtusioribus) achænia lineam longa angulata glabrata; pappus achænio longior, setis circ. 30 minute barbellatis.

328. Baccharis aff. B. cassiniæfoliæ, D. C. an var?
63. Achyrocline flaccida D. C. 4,000 ft.
250. Gnaphalium spicatum Lam. 5,400 ft.
86. Verbesina guianensis, Baker 5,400 ft.

27. **Calea ternifolia,** Oliv. sp. nov.—Suffrutex scaber, foliis ternatis ellipticis v. ovato- v. obovato-lanceolatis breviter petiolatis late acutatis utrinque apicem versus 1-3-dentatis supra scabris subtus præcipue in costa nervisque setulosis, capitulis circ. 20-floris homogamis pedunculatis ad apices ramulorum umbellatim dispositis, involucri squamis exterioribus herbaceis ovatis v. ovato-oblongis capitula brevioribus, squamis interioribus rigidiusculis late oblongis obtusis striatis, paleis concavis obtusis superne leviter dilatatis, ovariis parce setulosis paleis pappi acuminato-subulatis brevioribus. Arapoo River. *E. F. im Thurn.* Folia rigida ¾-1⅓ poll. longa, 5-8 lin. lata; petiolus ad 1 lin. longus. Umbellæ 3-5 cephalæ, pedunculis hispidulis capitulis sæpe

paullo longioribus. Capitula late campanulata ⅓ poll longa atque lata.

247. Erechthites hieraciifolia, Raf. 5,400 ft.

10. Stifftia condensata, Baker. Nr. Waetipoo M.

314, 346. Centropogon lævigatus, A.D.C. var ? Ledge 5,400 ft.

77. ,, surinamensis. Presl. ? 3,500 ft.

56. Psammisia ? sp. (inadequate) 5,400 ft.

49. Psammisia, with glabrous smooth purple brown stem, ovate-oblong shortly apiculate quintuplinerved leaves of 4 to 6 ins. and contracted umbelliform racemes of flowers 1 in. in length on pedicels of ½-¾ in. This is probably Schomburgk's No. 670/974 of which corollas are wanting in our example. Whether it be Klotzsch's *P. guyanensis* I cannot say. Roraima upper slope. *E. F. im Thurn.* Under the same numoer is apparently another Psammisia, in early bud, with more broadly elliptical leaves and acute calyx segments.

109. Notopora Schomburgkii Hook. f. 5,400 ft.

243. Sophoclesia aff. S. subscandenti (ovario glabro) Ledge 7,300 ft.

329, 333. Vaccinium an V. floribundum, H.B.K. ? (V. polystachyum ? Bth.) Top and Ledge.

326, 365. Vaccinium an V. floribundum, H.B.K. var. ? Top.

308. **Ledothamnus guyanensis,** Meissner in Mart. Fl. Bras vii, 172 var minor; foliis minoribus imbricatis acutis ciliolatis, floribus sessilibus v. subsessilibus, filamentis anthera 3-5 poll longioribus. Roraima: Upper part of ledge and summit. *E. F. im Thurn.*

Possibly a distinct species, but as our Schomburgk specimens are more advanced and scarcely in a comparable state, better left as above for the present. The leaves are only about 2½ lines long (in the type 4 lines). minutely setulose ciliolate, Flowers 1 to 1¼ in. in diameter, of vivid crimson. In our type the flowers are on pedicels, of ¼ to 1 in., but these may perhaps elongate after flowering.

Befaria guianensis, Kl. Label missing.

310. Befaria aff. B. resinosæ, Mutis (sepalis obtusioribus) 2 forms Top.

With No. 333 Pernettya nr. P. parvifolia Bth. and allies (in fruit.)

103. Gaultheria cordifolia, H.B.K. 5,400 ft.

332. ,, aff. G. vestitæ. Bth. pedicellis longioribus. Top.

137. Lucuma rigida, Mart. and Eichl. (nr. House.) 5,400 ft.

108. Grammadenia lineata Bth. 5,400 ft.

36. Ditassa taxifolia, Dene. Arapoo R.

155. **Vincetoxicum** (Orthosia) **hirtellum**, Oliv. sp. nov.—Volubile, caule gracili pilis brevibus subpatentibus hirto, foliis ovali-oblongis rigidiuscule apiculatis, marginibus revolutis, supra hirtellis in sicco rugulosis, subtus præcipue in costa pilis patentibus hirtis, cymis sessilibus v. brevissime pedunculatis pauci v. plurifloris folio brevioribus, floribus subsessilibus v. pedicello calyce vix longiore, corollæ lobus angustus intus hirsutus, coronæ segmentis 5 basi in annulo brevissimo continuo insertis lineari-lanceolatis gynostegium fere æquantibus, stigmate obtuso. Roraima: *E. F. im Thurn.*

Folia $\frac{2}{3}$-$\frac{3}{4}$ poll longa; petiolis $\frac{1}{12}$ poll longus v. brevior Flores $\frac{1}{8}$ poll. longi. Very much resembles in general facies *Ditassa pauciflora.*

147. Nephradenia linearis, Bth??

113. Curtia (Schuebleria tenuifolia Don) 5,400 ft.

47. Lisianthus amænus Miq. 5,400 ft.

306. **Lisianthus im Thurnianus**, Oliv. sp. nov.—Gracilis glaberrimus, caule inferne folioso teretiusculo internodiis folio brevioribus utrinque lineis elevatis duabus notatis, foliis coriaceis obovatis ellipticisve obtusis v. obtusciusculis margine anguste revolutis triplinervus, pedunculo elongato cymis 3-2-floris, floribus longe pedunculatis calyce ($\frac{1}{4}$-$\frac{1}{3}$ poll. longo) 5-fido lobis ovato lanceolatis acutiusculis, corollæ (2-poll.) tubo leviter dilatato limbi lobis oblongeovatis acutis, filamentis elongatis gracilibus glabris inclusis, antheris oblongo, ellipsoideis inappendiculatis. Roraima: Ledge and Summit, *E. F. im Thurn.* Caulis 1-pedalis erectus v. basi decumbens. Folia $\frac{2}{3}$-$\frac{3}{4}$ poll. longa basi in petiolum angustata, $\frac{1}{3}$-$\frac{1}{2}$ poll. lata. Pedunculus communis 3-6 poll. longus; bracteæ superiores lineares v. ovales: Discus hypogynus o.

In our specimens the limb of the corolla looks as though it might remain straight or even slightly incurved in flower.

188. Lissianthus aff. L. macrantho sed calycis lobis acuminatis corollæ tubum æquantibus. Upper Slope.

3, Heliotropium aff. H. fruticoso conf. H. strictissimum = Schombk 185 & 283/576 Konkarmo.

24. Solanum an S. Convolvulus ? Sendn. (Inadequate). Arapoo R.

210. **Melasma ? spathaceum,** Oliv. sp. nov.—Scabrum foliis suboppositis v. inferioribus alternis brevissime petiolatis ovato ellipticis basi rotundatis v. leviter cordatis dentatis supra scabris, floribus pedunculatis in axillis superioribus pedunculis folio subæquilongis apice bibracteolatis, bracteolis linearibus, v. oblanceolatis basi angustatis, calyce alabastro acuminato florifero antice fisso spathaceo, corolla exserta leviter incurva tubo, superne leviter dilatato limbi brevis lobis subæqualibus lobo, postico truncato emarginato, lateralibus obtusissimis, antico obovato rotundato bifido. Roraima : Upper Slope, *E. F. im Thurn.* Ramula retrorsum hispiduli. Folia (exsicc. nigrescentia) ¾-1¼ poll. longa, 4-7 lin. lata. Calyx 5 nervius, alabastro, oblongo-ellipsoideus apice acuminatus, parce præcipue in nervis, scabridus, 10-12 lin. longus. Corolla 1¼ poll. longa, Stamina inclusa didynama; filamenta glabra; antheræ sagittatæ glabræ dorsifixæ loculis æqualibus basi apiculatis. Ovarium glabrum.

I have had too imperfect material to determine finally if this plant should be left in Melasma or regarded as the type of a new genus. There are no ripe fruits and I should like to be more confident about the form of the corolla lobes and their æstivation.

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129. Beyrichia ocymoides, Cham. circ 5,400 ft.

43. Utricularia Humboldtii, Schombk. 5,400 ft.

187. **Utricularia** (S. Orchidioides) **Campbellianum,** Oliv. sp. nov. scapo gracili (1½-2½ pollicari) uniflora sæpius squamis linearibus v. lineari-lanceolatis remotis bracteiformibus instructo foliis tenuibus obovatis obtusis basi in petiolum angustatis, bracteis ternis ovatis v, oblongo, ellipticis pedicello brevioribus v. æquilongis, calycis lobis ovato-cordatis obtusis, corollæ labio superiore brevi calycem vix superante, labio inferiore amplo rotundato integro, calcari gracili

cylindrico acutato incurvo labium corollæ æquante. Roraima: *Schomburgk;* Upper slope, *E. F. im Thurn.*

Folia cum petiola ½ poll. longa, lamina $\frac{1}{6}$-¼ poll. lata. Calyx lobis 4-5 lin. longis latisque. Corolla labio inferiore 1 poll. lato.

293. Utricularia aff. montanæ, Jacq. (U. unifloræ R. & P.) Top.
78. „ an tenuifolia, Benj. 3,500 ft.
287. Gesneracea? In fruit only. Path to upper Savannah.
64. **Tabebuia Roraimæ**, Oliv. sp. nov.—Ramulis ultimis puberulo vel scabrido-lepidotis, foliis trifoliolatis foliolis oblongo-ellipticis obtusis sæpe mucronulatis lateralibus breviter petiolulatis, supra glabrata sutbus cano-lepidotis nervis conspicuis depresso areolatis, racemis terminalibus pauci v. plurifloris, bracteis lineari-spathulatis scaebrulis pedicellis erectis bibracteolatis; calyce infundibuliforme lepidoto-puberulo lobis breviter ovato rotundatis, corrollæ tubo calyce triplo longiore infundibuliformi limbi lobis patulis late rotundatis. Roraima: 5,000 ft. *E. F. im Thurn.*

Folia petiolata; petiolus (in ramulis floriferis) 1-1½ poll. longus; foliola 2-3¼ poll. longa, 10-16 lin. lata; petiolulus centr. ¼-½ poll. longus. Flores 3½-4 poll. longi, limbo 2½-3 poll. lato.

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14. Aphelandra pulcherrima? Kth. v. Artetragona Nees. Ireng R.
81. Justicia sp. = Appun No. 1,387 (in part); Kookenaam Valley.
52. Lippia Schomburgkiana, Schr.
1. Stachytarpheta mutabilis V. Konkarmo.
38. Hyptis arborea, Bth. Arapoo R.
249, 98. Hyptis lantanæfolia Poit. 5,400 ft.
111. Coccoloba Schomburgkii, Meiss 5,400 ft.
139. Peperomia not identified; material scarcely adequate. 5,400 ft.
140. „ an P. tenella Dietr.? 5,400 ft.
196. „ „ „ ? Upper Slope.
224. „ reflexa, Dietr. „ „
219, 236. Hedyosmum brasiliense, Mt.? „ „
323. **Phoradendron Roraimæ**, Oliv., sp. nov.—Flavescens, ramulis teretibus infra nodos interdum compressis crassitie pennæ corvinæ parce hirtellis foliis lineari-oblongis v. anguste ovalibus acutiusculis, floribus monoecis, spicis

1-articulatis 5-7 floris, baccis ellipsoideis lævibus? carnosis. Roraima: Ledge and summit, *E. F. im Thurn*,

Folia carnosula moderate coriacea parce pilosula v. glabrata basi in petiolum brevem angustata, 5-9 lin. longa, 1-2 lin. lata: internodia ½-1 poll. longa. Spicæ axillares solitarieæ apiculatæ 1-2 lin. longæ; vagina bracteoli leviter bidentata v. subtruncata, lateraliter compressa.

Mr. im Thurn's No. 276 (Roraima, path to upper Savannah) may be a glabrate form of this plant with rather broader obtuse obscurely mucronulate leaves.

142. Phyllanthus pycnophyllus, Muell. Arg. 5,400 ft.
235. Croton aff. C. surinamensi, Muell Arg. Forest belt.
76. Sponia micrantha, Sw. 3,500 ft.
58. Burmannia bicolor, Mart. 4,000 ft.
121. Dictyostegia orobanchoides, Miers. Upper slope.
280. Pleurothallis stenopetala, Lindley, Upper slope Roraima,
183. Stelis grandiflora, Lindley, „ „ „
285. Stelis tristyla, Lindley. „ „ „
127. Lepanthes (inadequate) 5,400 ft. (Our House)
275. Octomeria ? sp. Upper slope
289. Microstylis umbellalata ? Sw.
279. Masdevallea picturata, Reichenbach fil. Upper slope
286. „ brevis, Reichenbach fil. „ „
57. Bulbophyllum Geraense, Reichenbach fil. 5,400 ft. (Our House)
290. Elleanthus furfuraceus, Reich. fil. Upper slope
274. Epidendrum tigrinum, Lindley. Upper slope
13. „ Schomburgkii, Lindley. Ireng River
42. „ elongatum, Jacquin, 5,400 ft. (Our House)

296. **Epidendrum alsum**, Ridley, n. sp. (§ Euepidendra paniculata.)– Caulis validus, ¼ uncia crassus ramosus; folia coriacea brevia ovata obtusa, 1¼ ad ¾ uncia longa ¾ lata. Vaginæ rugosæ vix uncia longæ. Panicula abrupte deflexa, ramis duobus flexuosis 1 ad 2½ uncia longis. Flores parvi carinosi, 8 in ramo, dissiti. Bracteae ovatæ cucullatae subobtusæ, Sepala lanceolata carinata petala angusta lanceolata quam sepala dimidio breviora, et paullo tenuiora, Labellum cymbiforme ovatum cordatum carnosum. Columna brevis. Top of Roraima. The affinity of this plant is with E. frigidum, Lind.

299. **Epidendrum im Thurnii**, Ridley, n. sp.—Caulis gracilis teres parum ramosus ultra runcialis. Folia angusta linearilanceolata coriacea carinata, uncia longa, $\frac{7}{8}$ lata, vaginis rugosis. Racemi, 2 vel 3, deflexi vix uncia longi sex flori. Flores parvi tenues. Bracteæ ovatæ, pedicelli $\frac{3}{4}$ æquantes. Pedicelli $\frac{1}{2}$ unciales. Sepala lanceolata oblonga obtusa curva, circiter $\frac{1}{8}$ uncia longa. Petala linearia angusta uninervia. Labellum ovatum cordatum cymbiforme, basi angustatum. Columna gracilis paullo recurva. Anthera pileata subcornica obtusa capsula fusiformis. Top of Roraima.

322. **Epidendrum montigena**, Ridley, n. sp.—Caulis teres gracilis, ultra semipedalis. Folia elliptica lanceolata mucroniata carinata, uncia longa $\frac{3}{8}$ lata; vaginae $\frac{3}{4}$ uncialis rugosae. Racemi deflexi multiflori, haud ramosi circiter 3 uncias longi. Flores parvi tenues. Bracteæ ovatæ subacutæ patentes, Sepala lanceolata ovata falcata $\frac{1}{4}$ uncia longa. Petala angustiora lanceolata. Labellum cymbiforme lata cordatum, carnosum. Ledge and top,

51. Epidendrum durum Lindley. Our House

300. **Epidendrum violascens**, Ridley, n. sp.—Caulis semipedalis gracilis foliis distichis lectus, Folia brevia brevia lanceolata crassiuscula recurva, $\frac{1}{4}$ uncia longa; vaginis superiorum violaceis. Panicula erecta gracilis 5 uncialis, ramis paucis tenuibus. Flores pauci perparvi. Bracteae lanceolatae breves recurvæ. Sepalum posticum lanceolatum obtusum trinervium, lateralia basi connata et ad basin labellum adnata lanceolata obliqua apicibus excurvis, trinervia. Petala linearia angusta uninervia, Labellum rotundatum subreniforme, marginibus serrulatiss costae tres elevatae versus apices attenuatæ, columna crassiniscula. Top of Roraima.

304. Epidendrum, sp. 7,500 Ledge.

80. Cattleya Lawrenceana. Reichenbach fil. C. pumila, Schomburgk, "Reise Brit. Guian." p. 1,068 non. Hooker. Roraima.

55. Cyrtopodium parviflorum, Lindley. Roraima 4,000 ft.

50. Zygopetalum Burkei, Reichenbach fil. Our House

61. Koellensteinia Kellneriana, Reichenbach fil. Roraima 4,000 ft.

360. **Aganisia alba**, Ridley, n. sp.—Pseudobulbus nullus. Folia 2-volata lanceolata acuta, basi attenuata sub-coriacea, costis tribus elevatis in dorso, 7 uncias longa, $\frac{5}{8}$ lata, scapus lateralis erectus, 13 uncias longus, vaginis 2-3 apice obtusis amplexis, remotis paullo ampliatis. Racemus laxus, 10-florus. Flores, mediocres, uncia longa et lata. Bracteae Pedicellis multo breviores ovatæ acutæ inferiores vaginantes. Pedicelli $\frac{1}{2}$ uncia longi. Sepala ovata lanceolata subacuta. Petala subsimilia obtusiora et angustiora. Labellum integrum, mentum plicatum, lamina rhomboides obtusa lata. Columna brevis crassiuscula, alis magnis obtusis falcatulis apicibus curvis. Anthera subconica. Stigma semilunare. Kookenaam River 3,000 ft.

This plant is most nearly allied to A. cyanea, Benth (Warrea cyanea, Lindl.). There is a figure of what seems to be the same species in the drawings made by Schomburgk preserved in the British Museum. It was obtained at Takootoo, and is represented with white flowers, with the base of the lip and the mentum yellow, a few faint purple stains towards the apex of the lip and purple streaks on the face of the column. The fruit deflexed, oblong in shape. It is found also in the region of the Kaieteur Fall.

114. Oncidium nigratum, Lindley 5,400 ft. Our House.

12. **Oncidium orthostates**, Ridley, n. sp.—(Pluritubercula Homœantha expansa). Pseudo bulbus oblongus 2 uncias longus. Folium lanceolatum oblongum 3 uncias longum uncia latum. Scapus elatus validulus rigidus ultra bipedalis. Bracteæ lanceolatæ deflexæ breves $\frac{1}{8}$ uncia. Flores mediocres, iis O. coesii æquantes. Pedicelli $\frac{1}{2}$ uncia longi. Sepala lanceolata subacuta, petala subsimilia viridia brunneo-m aculata (ex sicco). Labelli lobi laterales spathulati obtusi, medius basi angustatus rotundatus reniformis emarginatus, cuspide minuta. Calli carina lamellas duas breves gerens. Columna brevis lobis obtusis magnis dolabriformibus tenuibus. Pedicellus pollincorum elongatus ligulatus discus oblongus quadratus margine exteriore croceus. Ireng River No. 12, im Thurn; 23 Savannah, W. H. Campbell. sp. indeterminanda, Upper Slope Roraima.

148. Catasetum cristatum? Monachanthus form. Our House.
115. Pogonia parviflora, Reichenbach fil. 5,400 ft. Our House.
19. Sobralia stenophylla, Lindley. Spelinicola. Arapoo River.
273. Sobralia, sp. indeterminable. Upper Slope, Roraima.
342. **Spiranthes bifida**, Ridley, n. sp. Tubera elongata clavata.

Folia ovata petiolata acuta tenuia parva, lamina semiuncia longa ¼ uncia lata, petiolus vix semiuncialis. Caulis debilis parce pubescens, ferme 10 uncialis, vaginis circiter 9 laxis lanceolatis acuminatis dissitis, ⅜ uncia longis. Racemus densus spiralis, uncia longus. Bracteæ flores superantes, lanceolatæ acuminatæ. Sepala, petala et labellum subsimilia, lanceolata angusta obtusa, marginibus involutis apice bifida, minute papillosa. Petala quam sepala angustiora. Columna brevis, anthera erecta obtuse acuta, ovarium minute pubescens. Our House, Roraima.

131. Stenoptera viscosa Reichenbach fil. Our House, 5,400 ft.
173. **Stenoptera adnata**, Ridley, n. sp.—Tubera plura lanata elongata. Folia tenuia membranacea lanceolata acuta 3 uncias longa. ½ lata. Caulis validulus 17 uncialis supra pubescens. Vaginis pluribus dissitis lanceolatis acuminatis usque ad basin fissis, longissima 1½ uncialis. Racemus multiflorus densus pubescens. Flores parvi reversi. Bracteæ lanceolatæ acutæ ⅜ unciales floribus æquantes. Ovarium breve crassiusculum pubescens; Galea (sepalum posticum petala adnata) ovata cucullata obtusa, marginibus fimbriatis. Sepala lateralia oblonga ovata acuta. Labellum ovatum lanceolatum, lobis lateralibus tenuibus erectis vixdistinctis, medio lingui-formi, carnoso, obtuso, supra canaliculato, basi subtus pubescente. Columna elongata gracilis apice clavata, parte inferiore pubescente. Upper slope.

9. **Pelexia aphylla**, Ridley, n. sp.—Tubera desunt, folia radicalia nulla, caulina lanceolata acuminata 6 dissita, superiora latiora, Caulis 8 uncialis pubescens proesertim versus basin. Flores pauci mediocres, albi, sepalum posticum ad petala adnatum, galeam efformans, lanceolatam acuminatam cucullatam, petala quam sepalum breviora. Sepala lateralia lanceola linearia porrecta marginibus involutis,

Labellum cuneatum spathulatum obtusum minute pubescens, subemarginatum labulo obscuro in medio; calcar ad ovarium arcte adnatum. Columna brevissima, rostellum prolongatum. oblongum obtusum canaliculatum porrectum. Anthera lanceolata obtusa vix biloculata. Pollinia pyriformia bicrura discus ovalis rotundatus. Waitipoo Mountain.

251. Habenaria parviflora. Lindley. (Our House, 5,400 ft.)

367. **Habenaria Moritzii**, Ridley, n. sp. Caulis semipedalis ad pedalis foliatus. Folia erecta lanceolata acuta dissita, maxima 2 uncias longa ¼ longa ¼ lata, Racemus laxus circiter 15-florus Bracteæ lanceolatæ acuminatæ. Flores parvi. Sepalum posticum erectum, lateralia deflexa, ovata lanceolata mucronata. Petala bifida, lacinia postica erecta anguste linearia-lanceolata quam sepalum posticum paullo brevior anguste linearis obtusa recurva. Labellum trilobum lobi laterales filiformes quam medius longiores et angustiores. Calcar lineari clavatum ¼ uncia longum. Columna majuscula. Anthera obtusa, apices breves, recti, lobi stigmatici crassiusculi obtusi breves.

At 4,000 feet Roraima. No. 630b. Moritz. Venezula

53. Selenipedium Lindleyanum Reichenbach fil. (Our House 5,400 feet) Roraima and S. Klotscheanum Reichenbach fil. Cotinga River.

315 or 311 (2 labels) Tillandsia stricta, var. ?

316. Tillandsia, sp. ? (Inadequate).

45. Puya (probably new). (Inadequate).

366. Cipura paludosa, Aubl.

28. Sisyrinchium alatum, HK.

298. Nietneria corymbosa, Kl. and Schk. Top.

297. **Tofieldia Schomburgkiana**, Oliv sp. nov. Foliis elongato-linearibus longe acuminatis minutissime ciliolatis longitudinaliter striatis basi distiche vaginantibus, scapo erecto tereti glabro foliis longioribus, floribus strictis racemosis pedicello erecto subæquilongis, calyculi bracteolis ovatis acutis perianthio 6-plo brevioribus, segmentis perianthii erectis oblongis acutis valide 5-7-striatis Roraima, 6,000 ft., *Schomburgk;* Summit. *E. F. im Thurn.*

Folia 3-12 poll. longa, ⅛-¼ poll. lata. Scapus ⅓-2 ped. longus, 5-9- (3-x) florus Flores flavido-virentes semi

pollicares; perianthii segmenta temp. florif. acutata persistentia rigida. Bracteæ ovato lanceolatæ appressæ.

Nearly allied to T. falcata, W. (T. frigida H.B.K.) from which it differs in its strict inflorescence of longer pedicels flowers.

Schomburgk describes the leaves as margined with red.

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257. Xyris Fontanesiana, Kth. 5,400 feet.

62. **Xyris setigera,** Oliv. sp. nov. Subacaulis foliis linearibus setoso acuminatis marginibus minutissime setuloso scabridis scapo foliis 4-5 plo longiore stricto gracillimo subtereti glabro capitulo ovoideo paucifloro bracteis coriaceis obtusis ovatis v. ovato ellipticis staminodiis ad faucem corollæ insertis bipartitis pencillatis, antheris filamento libero longioribus. Roraima, 4,000 feet. *E. F. im Thurn.*

Folia 1-2 poll. longa, $\frac{1}{24}$-$\frac{1}{20}$ poll. lata. Scapi 5-7 poll. longi 1 v. 2 ex una radice; vagina carinata angusta foliis pusillo longior. Bracteæ interiores cymbiformes oblongo elliptica obtusæ v. marginatæ $\frac{1}{4}$ poll. longæ. Sepalia lateralia linearia complicata anguste carinata, carina obsolete denticulata.

240. **Xyris witsenioides,** Oliv., n. sp. Caulescens caule decumbenti subscapo sæpius dichotomo, foliis rigidis distiche arcte inbricatis linearibus longitudinaliter striatis glabris ad apicem acutissimum gradatim angustatis, basi vaginante scariosa spadicea, scapo gracili foliis 3-5 plo longiore capitulis paucifloris bracteis glabris obtusis v. interioribus majoribus emarginatis, sepalis lateralibus incurvis rigidis carinatis carina scabriuscula, staminodiis flabellatim dilatatis longe penicellata-plumosis, ovario apice rostrato rostro persistente. Roraima: Ledge, 7,300 feet. *E. F. im Thurn.*

Folia $2\frac{1}{2}$ poll. longa 1 lin. lata leviter falcatim incurva. Scapus in dichotomiis solitarius compressiusculus v. subangulatus, 6-9 poll. longus; vagina foliis brevior. Capitula $\frac{1}{2}$ poll. longa bracteis haud arcte imbricatis.

Singular in the Witsenia-like habit of its stout stems, in our specimens 3-4 ins (ranging to 6-8 ins. *E. F. im Thurn.*) in length, lateral branches being given off immediately under the solitary scapes.

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312. **Abolboda sceptrum**, Oliv., n. sp. Foliis lineari-lanceolatis acutis rigidis læte viridibus leviter glaucescentibus, scapo crassitie pennæ anserinæ, floribus capitalis, capitulis floriferis 4-5 poll. diam. bracteis ovatis acutis rigidis sepalis $\frac{1}{2}$-$\frac{2}{3}$ brevioribus, sepalis ovato-lanceolatis subæquilongis lateralibus carinatis, petalis limbo ovato flabellatim venoso ovario ovoideo stylo longo basi appendicibus 3 crassiniusculis arcte uncinatis ovario æquilongis circumdato, ovula plurima. Roraima, Summit. *E. F. im Thurn.*

Folia 6-7 poll. longa. Bracteæ ovatæ v. interiores ovato-lanceolatæ $\frac{3}{4}$-$1\frac{1}{2}$ poll. longæ. Sepala $1\frac{1}{3}$-$1\frac{3}{4}$ poll. longa. Petala 2-$2\frac{1}{2}$ poll. longæ, inferne in tubum leviter curvatum ovalita. Stamina petalis breviora; filamenta anguste linearia; antheræ lineares. Ovarium cartilagineum $\frac{1}{4}$ poll. longam; stylus $1\frac{3}{4}$ poll. longus.

The leaves I have not seen, Mr. im Thurn having kindly supplied me with a note of their size and form. He describes the foliage as "Yucca-like". Our specimen consists of a well-developed capitulum and 8-9 ins of its scape. The flowers hardly admit of being satisfactorily analysed. They are very much larger than in other species seen by me, and the tube of the united petals much wider. The singular uncinate appendages are inserted with the style upon the ovary, not as in some species at a distinct interval above it.

338. Stegolepis guianensis, Kl. 6,000 ft.

34. Eriocaulon Humboldtii, Kth. ? (= specimen from Roraima, Schomburgk) Arapoo River

33. Pæpalanthus, Schomburgkii, Kl. Arapoo River

60. ,, flavescens, Kth. (eriocephalus Kl.) 4,000 feet.

294. **Pæpalanthus Roraimæ**, Oliv. sp. nov. Acaulis foliis dense rosulatis brevibus rigidis linearibus obtusiusculis basi latioribus leviter falcatis rectisve, basi arcte imbricata lanuginosa excepta glabra longitudinaliter striata, scapo solitario vaginato, vagina foliis subduplo longiore spathacea v. bifida glabra involucri bracteis linearia lanceolatis glabratis v. parce pilosis fuliginosus, bracteis disci flores stipantibus oblanceolatis v. obovato-cuneatis cymbiformibus. Roraima summit: *E. F. im Thurn.*

Folia ¾-1 poll. longa. Scapus glabrescens v apicem versus obsolete puberulus 3½-4½ poll. longus. Capitula hemisphærica ½ poll. diam. Flores breviter pedicellati. Perianthium segmentis exterioribus liberis obovatis concavis apicem versus coloratis interioribus staminigeris subæquilongis. Ovarium triquetrum.

269. **Anthurium roraimense**, N. E. Brown, sp. nov. Cataphyllis magnis lanceolatis, petiolis teretibus elongatis, lamina cordata subacuminata lobis posticis semioblongis quam antico subtriplo brevioribus sinu parabolico sejunctis, nervis primariis 13, venis primariis costa utrinque 6-7, omnibus supra subtus prominentibus; pedunculo valido tereti; spatha oblongo-lanceolata, filiformi-acuminata; spadice stipitato, spatha subæquante valido.

Hab. Roraima British Guiana, *E. F. im Thurn.*

Cataphylla minora 3 poll. longa, majora 7-8 poll. longa, 1-1¼ poll. lata, pergamentacea reticulato, venosa, nervi, intramarginali margine valde approximato Spatha 5½ poll. longa, 1¾ poll. lata. Spadix, cum stipite ½ poll. longa, 5 poll. longus ½ poll. crassus. Flores, 1 lin. diam. stylo conico brevissime exserto.

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382. Geonoma Appuniana, Spr.

358. Euterpe 5,400 ft.

259. Fimbristylis hispidata Kunth (Our House 5,400 ft.) Roraima.

245. Rhynchospora glauca Vahl. (Our House) 5,400 ft.

253. „ capillacea Torrey (Our House).

„ leptostachya Boeckla 5,400 ft.

248. Scleria hirtella Swartz.

209. „ bracteata.

357. Cryptangium stellatum Boeck. Upper Slope Roraima. The male plant of this species does not seem to have been hitherto met with or described, I therefore add a description of it.

Panicula longissima, rami graciles. Spiculae plures, binæ castaneæ, ¼ uncia longæ. Bractea lanceolata longe mucronata trinervia, mucro ciliata. Glumæ vacuæ 8 floriferæ 2. Stamina tria apiculis longis acuminatis, dimidio antheræ aequantibus.

Everardia, Ridley, nov. gen. (Cryptangiearum.) Herbea perennis. Caulevalido descendente lignoso. Folia conferta rigida recurva. Culmus paniculatus validus lateralis, escanilla folii inferioris oriens? Panicula laxa, rami plurimi inferiores masculi, supremi feminei, Spiculæ masculæ pluriflorae, glumis 3 vacuis 6 floriferis. Stamina tria, femineæ parvæ, glumis 4 vacuis. 1 florifera. Stylus brevis, stigma bifidum lobis brevis planis lanceolatis. Ovarium tri-angulatum breviter pedicellatum, cupula nulla. Sætæ hypogynæ copiosæ tortæ.

335. **E. montana**, Ridley, n. sp. Caulis brevis. vaginis latis decompositis superne tectus. Folia lineari-lanceolata acuta acuminata carinata recurva marginibus albociliatis, longissima 1 uncia longa, $\frac{1}{2}$ uncia lata. Culmus 14 uncias longus validus, compressus, anceps pro maxima parte paniculata, efoliata, vaginis paucis brunneis fissis, compressis sæpius lamina parva lanceolata obtusa rigida. Spiculæ masculæ singulæ, $\frac{3}{8}$ uncias longæ copiosæ castaneæ, inferiores pedunculatæ, Glumæ 3 vacuæ staminiferæ 6 lanceolatæ aristatæ. Marginibus parce ciliatis, arista brevis crassiuscula. Stamina in flore 3. Anthera acuminata filamento æqualis, $\frac{1}{4}$ uncia longa. Apiculus brevis simus processuum fasciculo terminali brevi. Spiculæ femineæ parvæ angustae. Glumæ vacuæ 4, una fertilis, exteriores cartilagineæ lanceolatæ brevi aristætæ, castaneæ interiores scariosæ, carina violacea. Stylus stigmate æqualis, teres crassiusculus brevis. Stigma breviter bifidum, lobis lanceolatis obtusis planis, violaceis, ovarium ellipticum oblongum obtuse triquetrum breviter pedicellatum, pedicello subtereti. Setæ hypogynæ cæpiosæ totæ. Pistillum $\frac{1}{4}$ unciale; caryopsis ferme $\frac{1}{8}$ uncia longa.

Ledge, Roraima. This genus is most nearly allied to Lagenocarpus but differs entirely from that genus and from the rest of the Cryptangieæ in the lateral inflorescence, the bifid stigma with short flat lobes, the absence of any cupule and the presence of a long number of hypogynous bristles.

262. Paspalum stellatum. Flugge. var.? 5,400 ft.

261. Panicum nervosum Lam.? ,,

254.	Arundinella brasiliensis, Raddi	5,400 ft
154.	Echinolæna scabra. H.B.K.	,,
246.	Saccharum (Eriochrysis) cayennensis P. de B.	,,
260.	Ischæmum latifolium, Kth.	,,
359.	? Guadua (barren)	,,
18.	? Chusquea (,,)	Arapook.
302.	Gram. dub (,,)	Top.

The following is a complete list of the ferns collected. The numbers are Mr. im Thurn's collecting numbers. Those enclosed within brackets indicate the position of the species in the sequence followed in our Synopsis Filicum. In determining the species I have had the kind help of Mr. Jenman, the Government Botanist of the colony, who is now in England, and who has paid special attention to ferns ever since he has lived in Demerara.

The summit of the mountain is 8,600 feet and the encampment of the party was pitched at 5,700 feet above sea-level. J. G. Baker.

343. Gleichenia pubescens, H.B.K. var. G. longipinnata, Hook. Upper slopes of the mountain.

92. Cyathea vestita, Mart. In the neighbourhood of the encampment.

270. Alsophila bipinnatifida, Baker, with a slender caudex six or seven feet in length. In the neighbourhood of the encampment.

87. (16*) **Alsophila macrosora**, Baker, n. sp. Stipitibus basi paleis linearibus brunneis imbricatis dense vestitis, frondibus amplis deltoideis bipinnatifidis crassiusculis proeter venas primarias faciei superioris glabris, pinnis oblongo-lanceolatis, pinnulis lanceolatis inferioribus distincte petiolatis basi truncatis ad costam alatam pinnatifidis segmentis tertiariis oblongis crenulatis venis simplicibus erecto-patentibus 5-6—jugis, soris magnis globosis superficialibus intramarginalibus, receptaculis dense paraphysatis.

Basal paleæ extending 4-5 inches up the stipe, glossy moderately firm in texture, the largest ½ Inch long. Stipe a foot long, brownish, deeply grooved down the face. Lower pinnæ 15-18 inches long, 8-9 inches broad. Lower pinnules 4 inches long, ¾ inch broad, with a petiole ⅛ inch long,

which is articulated at the base. Tertiary segments $\frac{1}{6}$ inch broad. Allied to the Bahian A. præcincta, from which it differs by its more coriaceous texture, crowded sori and densely paraphysate receptacle.

37. Alsophila villosa, Presl.

318. (16*) **Hymenophyllum dejectum,** Baker, n. sp. Stipitibus productis paleis pallidis ascendentibus lanceolatis præditis, frondibus oblongo-lanceolatis bipinnatifidis erectis glabris, pinnis lanceolatis confertis decurvatis pinnulis superioribus simplicibus inferioribus profunde pinnatifidis, segmentis ultimis linearibus integris uninervatis, soris breviter pedicellatis ad basin segmentorum ultimorum impositis, involucro campanulato valvis argute serratis.

Rootstock not seen, Stipes 2-3 in. long, clothed with minute inconspicuous pale membranous paleæ, as is also the rachis. Lamina 4-5 in. long, $\frac{3}{4}$ in. broad. Pinnæ decurved, not more than $\frac{1}{2}$-$\frac{3}{4}$ in. long. Final segments $\frac{1}{12}$-$\frac{1}{8}$ in. long, not more than $\frac{1}{6}$ line broad. Involucre $\frac{1}{3}$ line broad. A very distinct novelty, allied to H. demissum and H. javinicum.

118, 199, 374, Hymenophyllum polyanthos, Sw., upper slope of the mountain.

207, 302, 370, 372, 373, Hymenophyllum microcarpum Hook. Upper slope of the mountain. This is evidently not more than a variety of H. polyanthos.

205. Hymenophyllum crispum, H.B.K. Upper slope of the mountain.

203, 375. Hymenophyllum lineare, Sw. Upper slope of the mountain : (200) var. antillense, Jenman.

292. Hymenophyllum fucoides, Sw. Upper slope of the mountain.

271. Trichomanes macilentum, V.D.B. Upper slopes of the mountain. Will have, I think, to be regarded as not more than a variety of T. Bancroftii, Hooker.

198, 201, 349, Trichomanes pyxidiferum, L. Upper slope of the mountain. 349 represents the variety T. cavifolium, C. M.

99, 347. Trichomanes crispum, Sw. The higher number from the upper slopes of the mountain, the lower from the neighbourhood of the encampment.

119. Trichomanes rigidum, Sw. Neighbourhood of the encampment.

120. Davallia Imrayana, Hook. Upper slopes of the mountain.

344. Lindsaya guianensis, Dryand. Upper slopes of the mountain.

149, 150, 30. Lindsaya stricta, Dryand. The two lower numbers gathered near the encampment, the other on the mountain top.

161, 303. Hypolepis repens, Presl. Base of the cliff, 194, 195 are young forms of Hypolepis most likely the same species.

144. Pteris lomariacea, Kunze. Neighbourhood of the encampment.

160. Pteris incisa, Thunb. Base of the cliff.

156. Lomaria Plumierii. Desv. Upper slope of the mountain.

88, 167. Lomaria procera. Spreng. Upper slope of the mountain and in the neighbourhood of the encampment.

48. Lomaria Boryana, Willd. Neighbourhood of the encampment.

157, 369. Asplenium lunulatum, Sw. var, A. erectum, Bory. Base of the cliff.

171. Asplenium rhizophorum, L. var. A. flabellatum Kunze. Upper slope of the mounatin.

143. Asplenium furcatum. Thumb. Neighbourhood of the encampment.

272. Aspidium capense, Willd. Path to the upper savannah.

275. (4*) **Nephrodium (Lastrea) brachypodum,** Baker, n. sp. Caudice erecto, stipitibus brevissimis cæspitosis pilosis, frondibus parvis lanceolatis firmulis subglabris simpliciter pinnatis e medio ad basin et apicem sensim attenuatis, rachi piloso paleis paucis patulis lanceolatis prædito, pinnis sessilibus lanceolatis basi utrinque auriculatis centralibus profunde serratis reliquis integris infimis deltoideis, venis superioribus pinnarum simplicibus erecto-patentibus, inferioribus furcatis vel parce pinnatis, soris superficialibus medialibus, involucro membranaceo, subpersistente.

Frond 5-6 in. long, an inch broad, narrowed very gradually from the middle to both ends. Lower pinnæ not more than $\frac{1}{8}$ in. long. Stipes not above half an inch long. Central pinnæ $\frac{1}{8}$ in broad above the dilated base. Upper slope of the mountain. May be an involucrate form of the well-known West Indian Polypodium hastæfolium Sw., which it resembles very closely in size, shape, texture and venation.

94, 380. Nephrodium conterminum, Desv. Upper slopes of the mountain and neighbourhood of the encampment.

269. Nephrodium Leprieurii, Hook. Neighbourhood of the encampment.

126, 169, 225. Nephrodium denticulatum, Hook. Upper slopes of the mountain and neighbourhood of the encampment.

354. Nephrodium amplissimum, Hook. Upper slopes of the mountain.

102, 339. Nephrolepis cordifolia, Presl. Neighbourhood of the encampment.

356 (13*). **Polypodium (Phegopteris) demeraranum**, Baker, n. sp. Caudice erecto, stipite producto pubescente basi paleis paucis lanceolatis brunneis membranaceis prædito, frondibus oblongo-lanceolatis bipinnatifidis præsertim ad venas pilosis pinnis sessilibus lanceolatis ad costam alatam pinnatifidis inferioribus reductis infimis remotis perparvis, pinnulis oblongo-lanceolatis integris obtusis, venulis simplicibus 8-9-jugis pilosis, soris superficialibus parvis supramedialibus.

Stipites 6-8 in long below the much dwarfed lowest pair of pinnæ, grey and pubescent, as is the rachis. Largest basal paleæ half an inch long. Lamina 1½-2 ft. long, 7-8 in. broad at the middle. Largest pinnæ 4-4½ in. long, about an inch broad. Pinnules above ⅛ in. broad. Closely allied to the Himalayan B. auriculatum, Wall., in size, texture, and cutting, but quite different in the position of the sori. Found on the upper slopes of the mountain. Gathered previously by Appun, 1138.

168 (15*). **Polypodium (Phegopteris), roraimense**, Bakeri n. sp., Caudice erecto, stipite producto glabro stamineo, frondibus oblongo-lanceolatis bipinnatis praeter costas facie, superioris glabris, pinnis sessilibus lanceolatis simpliciter pinnatis inferioribus reductis infimis remotis perparvis, pinnulis oblongo-lanceolatis subintegris obtusis, venulis 7-8 jugis ascendentibus simplicibus, soris globosis superficialibus supramedialibus.

Stipes 3-4 in. long below the dwarfed lowest pinnæ. Lamina 1½ ft. long, 8-9 in. broad at the middle. Largest pinnæ 4-4½ in. long, about an inch broad. Pinnules ⅛ in. broad. Closely allied to the preceding and to the West Indian P. germanianum and ctenoides. Gathered upon the upper slopes of the mountain.

177, 182, 282, 307, 345, 352, 376. Polypodium marginellum, Sw., Upper slopes of the mountain in the crevices of the rocks.

184. (ex parte) Polypodium trifurcatum, L. Upper slope of the mountain, mixed with Enterosora Campbellii.

166, 350, 368, 377. Polypodium furcatum, Mett, Summit and upper slope of the mountain.

133. Polypodium serrulatum, Mett The type in the neighbourhood of the encampment and No. 351 var Xiphopteris Jamesoni, Hook, on the upper slopes of the mountain.

178. Polypodium trichomanoides, Sw. Upper slope of the mountain.

348. Polypodium truncicola, Klotzsch. Upper slope of the mountain. New to Guiana.

181. Polypodium moniliforme, Lag. Upper slope of the mountain var. P. saxicolum, Baker.

179. Polypodium tovarense, Klotzsch. Upper slopes of the mountain.

186. (159*) **Polypodium (Eupolypodium) Kalbreyeri,** Baker, n. sp., Rhizomate breviter repente paleis parvis patulis linearibus brunneis, frondibus deltoideis simpliciter pinnatis coriaceis glabris rachi nudo castaneo, pinnis linearibus adnatis contiguis integris superioribus sensim minoribus, venis immersis occultis furcatis, soris globosis superficialibus latitudinem totam pinnarum inter costam et marginem occupantibus.

Stipes 8-10 in. long, naked or furnished towards the base with minute squarrose soft hair-like paleæ. Rachis castaneous, like the stipe. Lamina 5-6 in. long, 3-3½ in. broad at the base. Pinnæ about 20 on a side below the caudate apex of the frond, ⅛ in. broad at the base, narrowed gradually to an acute, point. Sori a line in diameter, 12-16 jugate on the lower pinnæ. Nearest the Andine P. melanopus, Hook and Grev, from which it differs by its stiffly erect stipes, frond broadest at the base, and obscure immersed veins. Found on the upper slopes of the mountain and gathered previously by Kalbreyer on the mountains of the province of Ocana in New Granada at an elevation of 6,500 ft. above sea-level.

186 (ex parte) **Polypodium (Eupolypodium) kookenamæ,** Jenman, sp. nov., Caudice crasso, breviter repente v. suberecto, paleis castaneis subulatis ciliatis dense vestito. Stipitibus paucis, contiguis, suberectis rigidiusculis, subferrugineis,

obscure ciliatis. Frondibus arcuatim procumbentibus, oblongo-lanceolatis, basi truncatis, subcoriaceis, glabris, supra atrovirescentibus, subtus pallescentibus, incise pinnatifidis. Segmentis utrinque 16-20-jugis superioribus in apicem subintegrum acuminatum gradatim decrescentibus, integerrimis acutis, ad basin brevissime decurrentem paululum connexis sinu acuto. Costis mediis in parenchymate celatis. Rachi haud immerso, utrinque subfusco, furfuraceo. Venis 1-furcatis. Soris medianis, copiosis, rotundis, leviter depressis, ad apices anteriorum venlarum impositis. Upper slope of Roraima.

Stipites 7-9 in. l. erect, wiry. Fronds 6-8 in. l. 2 in. w. Segments $\frac{3}{4}$-1 in. l, linear-oblong, barely $\frac{1}{4}$ in. w. at the base, and not much narrowed outwards till the acute point is reached. Dark green above, pale metallic-green beneath. Intermediate between, P. melanopus, Hook and Grev. and P. bruneo-veride, Baker. Resembling the latter exactly in colour, but the fronds relatively broader and shorter. Occurred in set C. of the collection by mistake for P. Kalbreyeri, Baker.

180, 379. Polypodium taxifolium, Linn. Upper slope of the mountain.

104. Polypodium pectinatum, Linn. In the neighbourhood of the encampment.

124. Polypodium cultratum, Willd. In the neighbourhood of the encampment.

217. Polypodium zanthotrichium, Klotzsch (P. elliptico-sorum, Fee) Upper slopes of the mountain. Appears to be distinct specifically from P. cultratum by its uniformly elliptical sori.

281. Polypodium rigescens, Bory. Upper slope of the mountain.

176. Polypodium firmum. Klotzsch. Upper slope of the mountain.

378. Polypodium subsessile, Baker. Upper slope of the mountain.

190. Polypodium capillare, Desv., Upper slope of the mountain.

125 (212*) **Polypodium (Eupolypodium) melanotrichium** n. sp. Caudice erecto paleis subulatis crispatis vestito, stipite brevissimo gracillimo, frondibus oblongo-lanceolatis parvis flaccidis membranaceis glabris bipinnatifidis, pinnis lanceolatis adnatis, profunde pectinato-pinnatifidis inferioribus sensim minoribus, segmentis deltoideis acutis venis brevibus

simplicibus erecto-patentibus, soris globosis superficialibus cortularibus ad apicem venarum impositis.

Stipes and rachis black, thread-like, glabrous, Lamina 3-4 in. long, an inch broad at the middle, Central pinnæ half an inch long, $\frac{1}{8}$ in. broad, with 6-8 pairs of deltoid segments with a single sorus in the centre of each, Allied to the Brasilian P. achilleæfolium Kaulf, but quite different in texture, in the shape of the segments and by its very short simple veins. Found in the neighbourhood of the encampment.

172. Polypodium (Goniophlepium) loriceum, Linn. Base of the great cliff.

340. Polypodium (Phlebodium) aureum, Linn, var, P. areolatum, H.B.K. In the neighbourhood of the encampment.

208. Polypodium (Camyploneuron) angustifolium, Sw. var. P. amphostemon, Kunze. In the neighbourhood of the encampment.

295. (14*) **Gymnogramme (Pterozonium) cyclophylla**, n. sp. Caudice erecto, stipitibus cœspitosis elongatis erectis basi primum paleis minutis linearisubulatis patulis præditis, frondibus parvis nitidis rigide coriaceis apice rotundatis margine recurvato basi cuneatis margine plano, venis flabellatis immersis, soris oblongis ad venarum apicem solum productis cite confluentibus zonam angustam intramarginalem formantibus.

Stipes wiry 5-6 in. long. Lamina only about an inch long and broad. Found on the summit of the mountain.

101, 215 (14*) **Gymnogramme (Pterozonium) elaphoglossoides**, n. sp. Caudice valido lignoso paleis parvis subulatis nigro-castaneis dense vestito, stipitibus elongatis erectis nudis castaneis frondibus simplicibus integris rigide coriaceis nudis elliptico-lanceolatis acutis vel obtusis conspicue costatis basi cordatis, venis confertis, patulis parallelis simplicibus vel furcatis intra marginem evanescentibus, soris linearibus cite confluentibus frondis faciem totam inferiorem præter zonam angustam marginalem occupantibus.

Stipes wiry sometimes above half a foot long. Fronds 6-8 in. long ; fertile 1-2 inches, sterile sometimes 3 inches broad. Sori occupying the whole under surface except a

marginal border not more than $\frac{1}{8}$-$\frac{1}{12}$ in. broad. Found both upon the upper slopes of the mountain and in the neighbourhood of the encampment.

These two interesting novelties both fall under the genus. Pterozonium of Feé, figured at tab. 16 of his Genera Filicum. The only species known previously is the very rare Gymnogramme reniformis, Mart., figured Icon Crypt. Bras. tab. 26 and also in Hooker's 2nd Century of Ferns tab. 9 and on tab 49 of the Fern volume of Flora Brasiliensis. The two new species are very distinct both from one another and G. reniformis. In G. cyclophylla the sori form a narrow band just within the margin ; in G. reniformis a broad semicircle a distinct space within the margin ; whilst in G. elaphoglossoides they cover the whole surface except a narrow border.

194. Gymnogramme Schomburgkiana, Kunze, Upper slopes of the mountain.

197. Gymnogramme hirta, Desv. Upper slope of the mountain New to Guiana.

150. Gymnogramme flexuosa, Desv., Upper slope of Roraima, also new to Guiana.

Enterosora, Baker, genus novum. Sori oblongi vel oblongo-cylindrici exindusiati ad venas decurrentes intra frondis laminam orti, demum ad frondis faciem inferiorem rimis angustis obliquis imperfecte obvii, venæ pinnatæ, venulis paucis ascendentibus prope frondis marginem anastomosantibus et areolas steriles hexagonas sori unico centrali includentes formantibus.

Most resembles Gymnogramme, from which it differs mainly by having the sori immersed within the tissue of the frond and only appearing very partially on the lower surface even in a mature stage.

184 (ex parte) **Enterosora Campbellii**, Baker, n. sp. The only species. Upper slopes of the mountains, with Polypodium trifurcatum. Rootstock cylindrical, suberect, densely clothed with small brown membranous lanceolate paleæ. Stipes slender, brown, erect, wiry, 4-5 in. long, with a few very inconspicuous spreading fibrillose paleæ downwards. Lamina oblanceolate simple, subcoriaceous, glabrous, 6-8 in. long,

under an inch broad, obtuse, narrowed gradually to the base, conspicuously repand on the margin with broad rounded lobes, veins very distinct when the frond is held up to the light, arranged in pinnate groups, one opposite each lobe, the sterile veinlets forming unequal hexagonal areolæ, with a single vein bearing a sorus in the centre of each. Sori $\frac{1}{8}$-$\frac{1}{6}$ in. long, 4-6 to each of the central pinnated groups, erecto-patent as regards the whole lamina, seen partially at last on the lower surface by slits that seem as if they were made with a knife through the epidermis.

Frond in shape and texture much resembling that of Polypodium trifurcatum, from which it differs by its long stipes and totally different veining in addition to the entirely dissimilar shape and position of its sori. In naming it after the late W. H. Campbell Esq., I am carrying out the wish of Mr. im Thurn.

170. Vittaria lineata, Sw. Upper slopes of the mountain.

212, 218. Vittaria stipitata, Kunze. Upper slope of the mountain. New to Guiana.

229, 231. Acrostichum latifolium, Sw. Upper slopes of the mountain. Two different varieties, both rigid in texture, narrowed very gradually from the middle to the base, and 229 dotted over the under side with minute subpeltate brown paleæ.

233, 238. Acrostichum Lingua, Raddi.

267. Acrostichum stenopteris, Klotzch. In the neighbourhood of the encampment. New to Guiana.

266. Acrostichum decoratum, Kunze. In the neighbourhood of the encampment.

278. Acrostichum Aubertii, Desv. var. **crinitum**, nov. var. Recedes from the Brazilian and Columbian type of the species towards A. villosum by its much more crinite lamina both in the sterile and fertile frond, and by the stipes being clothed with squarrose subulate brown paleæ, as in the Venezuelan A Reichenbachii, Moritz. Path to the upper slope. The species is new to Guiana.

237 (45*) **Acrostichum (Elaphoglossum) leptophlebium**, Baker, n. sp. Rhizomate repente cylindrico lignoso paleis parvis membranaceis lanceolatis brunneis crispatis dense vestito, stipite

elongato stramineo subnudo, fronde sterili lanceolato membranaceo glabro paleis paucis lanceolatis ad marginem et faciem inferiorem prædito, venis laxis perspicuis erecto-patentibus simplicibus vel furcatis intra marginem terminantibus, fronde sterili multo minori stipite longiori.

Sterile lamina a foot or more long, 18-20 lines broad, cuneate at the base, with a slender fragile stipe, 4-5 inches long. Fertile lamina 4-5 inches long, an inch broad, with a stipe about a foot long. Found upon the upper slope of the mountain.

93. Acrostichum muscosum, Sw., var. A Engelii, Karst. In the neighbourhood of the encampment.

213. Acrostichum squamosum, Sw. Upper slope of the mountain.

41. Acrostichum (Rhipidopteris) peltatum. Sw. In the neighbourhood of the encampment.

100. Schizæa dichotoma, Sw. In the neighbourhood of the encampment, new to Guiana.

85. Schizæa elegans Sw. In the neighbourhood of the encampment.

263. Anemia tomentosa, Sw. In the neighbourhood of the encampment.

146. Lycopodium alopecuroides, L. In the neighbourhood of the encampment.

192. Lycopodium linifolum L var. sarmentosum rubescens, Spring. Upper slopes of the mountain.

230. Lycopodium subulatum, Desv. Base of the cliff.

226. (159*) **Selaginella (Stachygynandrum) vernicosa,** Baker, n. sp. Caule basi decumbente superne recto laxe pinnato, ramulis paucis brevibus ascendentibus, foliis heteromorphis distichis crassis firmis nitide viridibus, planæ inferioris confertis erecto-patentibus ovatis obtusis margine ubique denticulatis, planæ superioris duplo brevioribus ascendentibus ovatis obtusis valde imbricatis, spicis tetragonis brevissimis bracteis conformibus magnis ovatis acutis.

This belongs to the Atrovirides group in the neighbourhood of S. Martensii. The main stems are about half a foot long, the leafy branches an eighth of an inch broad and the leaves of the lower plane a line long. The type as described was found at the base of the cliff, and a variety (No. 381)

with much fewer, more elongated branches, near the encampment.

122. (186*) **Selaginella (Stachygynandrum) roraimensis,** Baker, n. sp., Caule erecto 3-4 pinnato, ramis laxe dispositis ascendentibus ramulis brevibus, foliis heteromorphis distichis membranaceis planæ inferioris laxis oblongo-lanceolatis acutis valde inæquilateralibus basi superiori producto late rotundato, planæ superioris ovatis ascendentibus cuspidatis. spicis tetragonis, bracteis conformibus ovatis acutis valde imbricatis acute carinatis sporangiis duplo longioribus,

Belongs to the Radiatæ group in the neighbourhood of S. radiata and confusa. The main stems are 4 or 5 inches long: the leafy branches $\frac{1}{6}$ in. broad and the leaves of the lower plane a line long. Found in the neighbourhood of the encampment.

(271*). **Selanginella (Heterostachys) rhodostachya,** Baker, n. sp., Caule decumbente ramis alternis deltoideis flabellato-pipinnatis, foliis heteromorphis distichis membranaceis, planæ inferioris laxe dispositis, erecto-patentibus ovatis obtusis paulo inæquilateralibus superioris consimilibus duplo minoribus valde ascendentibus, spicis brevissimis platystachyoideis, bracteis dimorphis ovatis acutis membranaceis.

Belongs to the group Prontiflore in the neighbourhood of S. consimilis and ottonis. The stems are half a foot in length and the leafy branches $\frac{1}{8}$ in. broad. This was contained in the collection without any number.

768. Hookeria (Omaliadelphus) crispa, G. Mull. Bot. Zeit 1855.

123. Imperfectly fruited. Near encampment.

51. Hypopterygium tamariscei, Sw. (Hypnum). Hew. Musci.

265. Frond without fruit, near encampment.

620. Polytrichum aristiflorum Mitt. Zl. Linn. soc. xii.

116. A few barren stems, near encampment. Creeping over the roots of this are a few stems of Gungermannia perfoliata, Swartz, or of one of the closely allied S. American species of the little group to which Mr. Spruce has applied the name Syzygiella in the Journal of Botany 1876, intending it to include Jungermannia perfoliata J. contigua and J. concreta, Grtesche J. plagiochiloides and J. pectniformis, Spruce, also J. macrocalyx Mont. To these must be added

J. geminifolia Mitt. Zl Linn. Soc. vii. 164 from tropical Africa and the J. subintegerrima, Reinev. Bb. et Nees Hep. Jav. in the Synopsis Hepaticarum, placed in Plagiochila (p.55) to this belong P. variegata Lind. P. variabilis Lacoste and also P. securifolia, Lind. Sp. Hep. t x. all which have the leaf angles united on both sides of the stem even when they are not opposite, a characteristic which is not mentioned in their original descriptions or depicted in their figures nor in that of the J. macrocalyx as found in the Synopsis. The perianth in J. subintegerrima agrees with that found in the species allied to J. colorata and as in their case is subtended by shortened and dentate involucral leaves.

Exactly similar instances of the conjugation of the leaf-angles are found in Plagichila, some of which do not otherwise resemble each other.

283. Plagiochila adiantoides, Sw. Lind. Male stems only Upper Slope.

204, 284. Aneura bipinnata Sw. (Jungermannia) Specimens taken from large tufts. Upper Slopes.

In these specimens the stems are 4-5 c.m tall including the side branches, 1 c.m wide, the ultimate ramuli with a limb of about two rows of more pellucid cells. In A. fucoides Hook. Musi Exot, t. 85, this limb is very much wider ; in A. Poepgregiana it is nearly or quite obsolete. Besides these. there are several other remarkable S. American species. A. balata, Gotts., from Chili, a very large species. A. prehensilis Hook, f. et Tayl. Fl. Ant. originally from Hermite Island, since collected by Cunningham with stems nearly six inches tall and always with its pruinose look when dry, A. polyclada Mitt, gathered in Otway Harbour, Patagonia, during the visit of the Challenger expedition, a small species about one and a half inches tall.

A. polyptera Mitt. from Magellan, collected in Cockle Cove by Dr. Coppinger H.M.S. Alert, fronds 10 c.m. alt, 2 c.m. lat, ramis approximatis tripinnatis ubique lamina 5-6 cell lata limbulus dorso planus, laevis ventre precipue in ramis ramulisque lamellis angustis longitudinalibus vestitus, and A. denticulata Mitt, from the Andes of Bogota gathered

amongst mosses by Weir-frons 5-6 c.m altus cum ramulis 1 c.m. latus ramis remotiusculis bipinnatis ubique limbo pellucidiore cell. 4 lato margine denticulatis divaricatis angustis subciliatis. All these species shew that in S. America there is a development of larger forms than are yet known elsewhere.

Blipharozia Roraimae, Mitt. n. sp. folia erecto-patentia imbricata cochleariformi concava integerrima lobulata obtusa; involucralia conformia, prianthera (abortiva) cylindracea abrupte obtusissima ore parvo rotundo. From the top of Roraima; one stem only.

Entire plant of a dark red brown colour, about 4 c m. tall; it is divided below into two, one being again forked, the leaves are imbricated in bifarious order and are repeatedly in interrupted series, each innovation arises from towards one side of the dorsal base of the perianth with small leaves which increase rapidly in size upwards, the largest being the involucral; here the greatest diameter is about 4 m.m. long, and of these as many as four are observable on the undivided stem; and as each innovation arises from the same position they stand at the side of the stem rather towards the neutral ride. In all particulars they closely resemble the abortive perianths seen on B. sphagnoides and other species; the young innovation also is in close similarity to that of the male amenta of that species, but there is no trace of the lobule, which is not, as has been supposed, distinct from the leaf in B. cochleariformis, but is seen from being an almost closed one in some species to be opened out in B. evoluta.