

Journeys in the Northern Andes

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JOURNEYS IN THE NORTHERN ANDES

J. HANBURY-TRACY

Meeting of the Society, 22 January 1940

THE Cordillera de Merida is a north-eastern branch of the main chain of the Andes, from which it diverges in the neighbourhood of Cúcuta, near the Venezuelan-Colombian border. It is some 250 miles long and 40 miles wide, and reaches its greatest altitude in the Pico Bolívar, 5007 metres, the highest summit in Venezuela and the culminating point of the snow massif near the centre of the range. To the north-east the range gradually peters out in the plains of Barquisimeto, and is unconnected with the coastal sierra in the region of Caracas. This cordillera, a mere outrider of the mighty Andes, possesses many distinguishing features, including a highly specialized flora. Of particular interest is the genus *Espeletia* (Compositae) the Andean counterpart of the African tree-senecios. These remarkable plants are peculiar to the *paramos* of the northern Andes, and are found in Venezuela, Colombia, and Ecuador. There are thirty known species of the genus, eighteen of which are found in Venezuela alone. The growth and distribution of the genus present many unusual botanical features. The term *paramo* needs some explanation: it is a local term, and, like most local terms, rather vague in its scope; at altitudes between 3000 metres and 4000 metres lie regions of open moorland of alpine character with a scanty vegetation of coarse grass, mosses, heaths, ferns, and shrubs. The term *paramo* sometimes includes the lower peaks, but it does not include the snow ranges. The *paramos* are not continuous, but frequently isolated one from another by deep valleys filled with tropical evergreen forest, thus leaving alpine islands on which some interesting differentiation of species has occurred.

Early in 1938, with the assistance of the authorities at the Royal Botanic Gardens, Kew, I made preparations for a botanical expedition to the Cordillera de Merida, accompanied by my wife, with the main object of making as representative a collection as possible of the *paramo* flora. There had been few previous collections from the *paramos* and the Kew Herbarium was

scantly represented in this section. Drs. Pittier and Jahn had made considerable collections in recent years, but little of their material had reached Kew. The earlier collections of Funck, Moritz,¹ and Schlim had gone mostly either to American or to continental herbaria. A number of paramos were still botanically unexplored, and there was a good prospect of obtaining some new species.

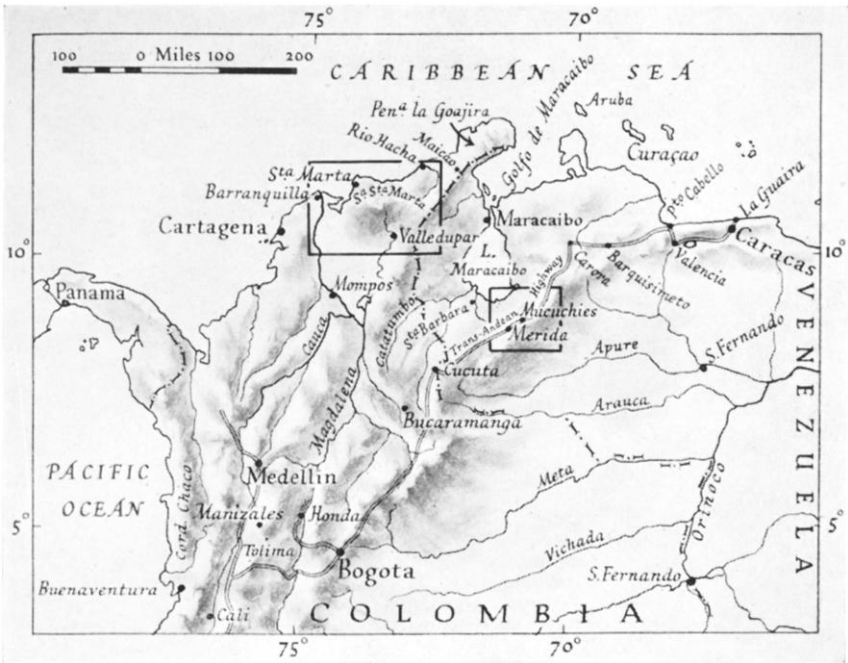
We planned to spend some six or seven months in the Cordillera, and, in order to include as many paramos as possible, we decided to make our base at Merida, making excursions from there by pack-mule and camping at the higher levels for three or four weeks at a time. On reading the accounts of previous collectors it became clear that the constant damp and lack of fuel were going to be our main difficulties, and so it proved. We had intended to continue collecting through the paramos of Colombia and Ecuador, but this plan was later changed to include the Sierra Nevada de Santa Marta, in the extreme north of Colombia. The expedition was curtailed by the outbreak of war after fifteen months in the field.

The main features of the Cordillera de Merida had already been mapped, although some detail still remains to be filled in, and we did not plan to include surveying in our operations until the latter part of the journey.

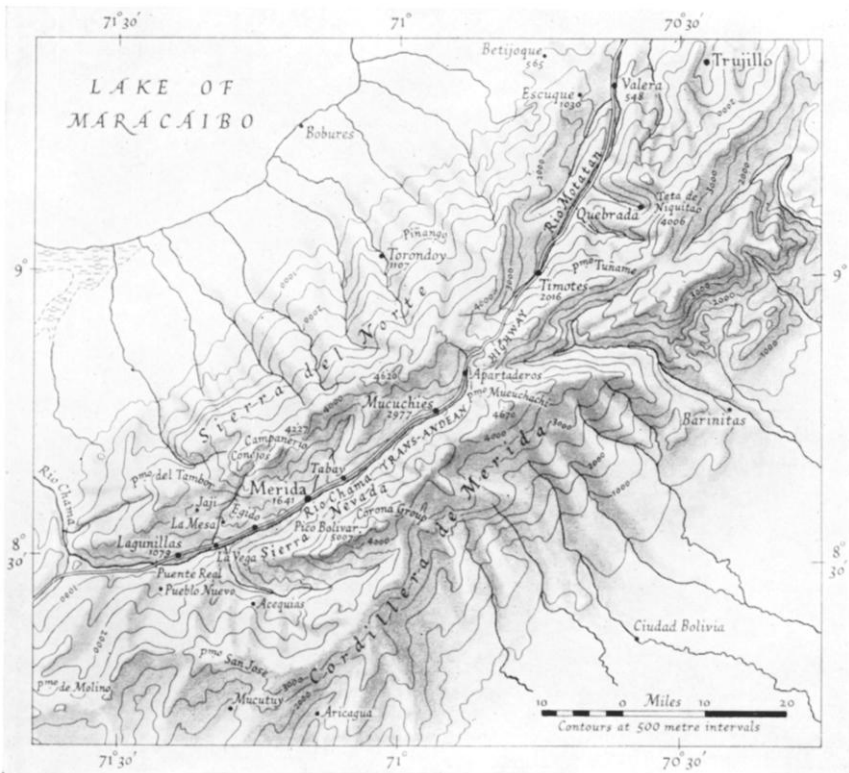
We arrived at La Guaira on 24 July 1938, and spent a few days in Caracas. Every assistance was kindly afforded us by the British Minister and by officials of the Shell Oil Company. We had been well advised to obtain the bulk of our equipment in England, as prices of all imported goods in Venezuela are extremely high, owing to heavy tariffs. Some local foodstuffs, such as bananas, beans, and coffee, are almost the only articles that can be bought cheaply. Camp servants for an extended mountain expedition in Venezuela are difficult to find. Muleteers are available for short journeys, but, on the whole, the natives are apathetic and unreliable, and definitely non-cooperative when it comes to camping out for more than a few days. We were warned not to rely on finding an Andino cook: "You will get nothing but rice and beans," said one authority; and it is useless to take natives from the steaming coast up to the mountains. In the end we engaged a Chinese cook who had previously worked in the oil camps. He proved disastrously inefficient.

A motor-road, opened in the '20's, leads from Caracas via Barquisimeto up to Merida in the heart of the Andes, 500 miles inland, and on to Bogotá in Colombia. It is for the most part very rough and often suffers severely from floods and landslides, but in spite of its short-comings it has effectively opened up communication with the mountain provinces, which until recently could only be reached by mule-tracks. Our heavy baggage was sent on by lorry to Merida, while we travelled by the weekly bus from Caracas. That journey was a tropical ordeal. Twelve passengers, with miscellaneous baggage, were tightly wedged into a box-body Ford, forming a suffering huddle of humanity for two and a half days. The heat was intense. Refreshments available *en route* consisted mainly of maize bread, black beans, and rather hostile-looking meat, the peak of ingenuity being reached by a dubious concoction of tapioca and tomatoes. The first day's journey led over rolling green hills, with plantations of maize, sugar-cane, and bananas. Turning off the metalled road which

¹ The herbarium of Moritz is at the British Museum (Natural History).—*Ed. G. J.*



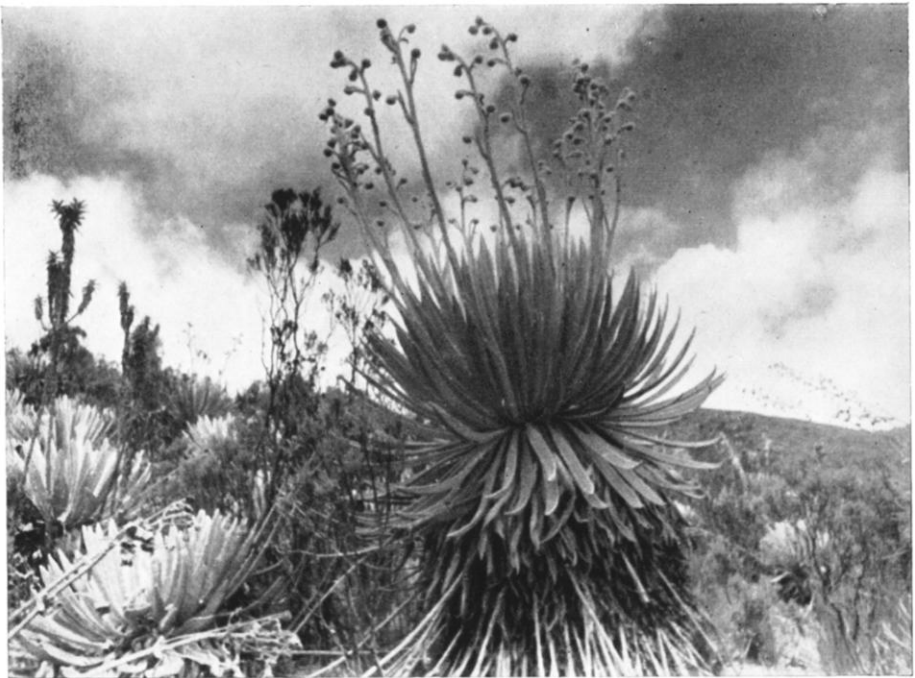
The Northern Andes



The Cordillera de Merida



Camp in the valley of the Rio Albaregas, Cordillera de Merida



"Espeletia spicata" with "Culcitium rex" in the background, Paramo de Campanerio

connects Caracas with Puerto Cabello, our route ran for several hours through dense forest with a heavy tangle of creepers and lianas. Late at night we reached Barquisimeto. The following day we passed through arid cactus desert under a burning sun, the Carora plains, and towards evening drove up the valley of the Rio Motatán, cold with mist, to the high Andes. As darkness fell we crossed the pass of Mucuchies, at 4200 metres, and had our first glimpse of the paramos, dotted with the silvery rosettes and yellow flower-heads of *Espeletia*.

On August 5 we reached Merida, a small Spanish-type town situated in the Chama valley at 1641 metres, on an extensive *mesa* or plateau. These mesas are noticeable features of the Chama valley and are relics of a glacial period. Their flat tops, often a mile or two in length, form natural sites for towns and villages in the otherwise steeply sloping valley. The district of Merida is extremely fertile, with intensive cultivation of coffee, bananas, sugar, and maize. The coffee is of excellent quality and forms the chief item of export. Above the cultivation thick forest commences at about 2000 metres, rising abruptly to the paramo regions. The snowy crest-line of the Sierra Nevada dominates the town to the south-east, culminating in the Pico Bolívar. The permanent snow-line has been observed to be receding rapidly in recent years and now lies at about 4250 metres. The climate of Merida is sub-tropical, with an intermittent rainy season from March to November, which reaches its height in August and September. Some inhabitants claimed there was an intervening dry season in July and August, but this was not borne out by our experience. However 1938 was an exceptional year, and the heaviest rains, with consequent floods, occurred actually in December, nominally the dry season. The driest months of the year are undoubtedly January and February.

We made our base in a small German-owned hotel, and set about obtaining mules through the good offices of Señor Avelino Briceño. Five pack-mules and two riding mules were purchased after some strenuous bargaining. The price of mules in these regions is between £15 and £20, but they can be bought more cheaply near the border of Colombia, whence they are imported. Scarcely any are bred in Venezuela. Hiring mules is advisable only for short trips of a few days. For an extended tour the expense would be excessive, whereas a string of mules can always be re-sold at the end of a trip with only slight loss.

As the rains were particularly heavy in 1938 we decided to wait till later in the year before making a tour to the Sierra Nevada, and meanwhile to devote our efforts to the Sierra del Norte, which bounds the Chama valley on the north-west. The first tour of three weeks was made to the Paramo del Tambor, which had not been visited by previous collectors. It can be reached in three days from Merida, but we planned to make two camps on the way up in order to collect specimens from the lower levels.

The starting-point of the mule track was Egido, a small town 8 miles down the Chama valley lying in a pocket of rich soil, which is the centre of the local sugar industry. The sugar, known as *panela*, is unrefined and made into brownish-yellow bricks. It forms a staple part of the diet of both peasants and mules; our muleteer impressed on us that we must take a load of it up to the paramos, the mules' normal ration being half a brick every other day. A large

sack of maize was also taken, the paramo grass being in most parts unsuitable for grazing.

Venezuela is the home of uncertain travel; a journey, by whatever means, is invariably accompanied by delay, confusion, and recrimination. The start of our small expedition was no exception. Three full hours were spent in loading. Serviceable pack-saddles are unknown in these parts: a mattress of sacking stuffed with straw is strapped to the mule and the rest is accomplished with yards of rope and much faith.

For the first 3 miles the route followed an open valley with cacti and xerophytic scrub. This dry belt is a striking feature of the lower Chama valley; the region appears to have been de-forested and considerable erosion has taken place; it is in marked contrast to the thickly forested upper slopes which verge on the paramos. Passing through the village of La Mesa we camped at Bocono, at 1800 metres, for three days. A common under-shrub, of nearly prostrate growth, with small mauve flowers, was *Centrosema virginianum*. Other shrubs found were *Cassia indecora*, *Aeschynomene fascicularis*, and *Stylosanthes guianensis*. A noticeable tree, not yet fully in bloom, was *Erythrina Poeppigiana*, known locally as the "Ceibo." Towards the end of the year it bears a brilliant mass of orange-coloured flowers. These foothills below the paramos are rich in colour: a country of abrupt green hills, with brown-tiled farmhouses standing among plantations of sugar-cane and maize, alive with brilliantly-coloured butterflies, dragon-flies, humming-birds (*colibri*), and parakeets. It is a rather overpowering scene of tropical luxuriance, with occasional glimpses of the snows on the far side of the Chama valley. There are said to be snakes in this foothill region, but they are comparatively rare. The worst pests are flies, sand-flies, and ticks, which abound in the long grass.

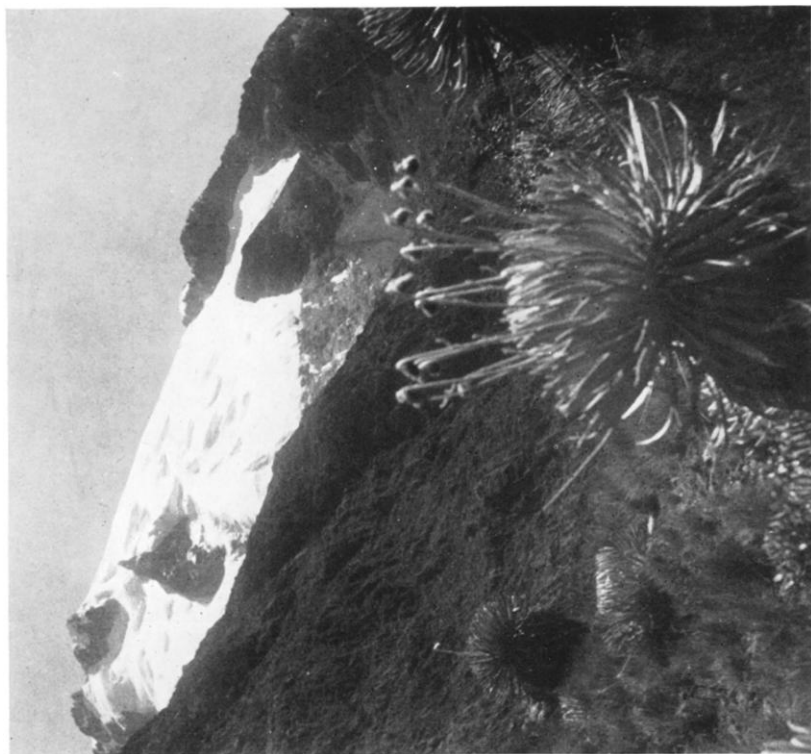
On August 15 we moved camp up to La Playa, at 2100 metres, an area of open park-like country above the village of Jaji. Plants collected here included *Monochaetum Bonplandii*, a low shrub with small magenta flowers, and *Lupinus meridanus*, the common blue lupin of these parts.

On August 20 we made the final climb to the Paramo del Tambor. At first the going was easy, but when we entered the hill jungle our difficulties began. The steep path was a morass of mud and often overgrown by bamboos and blocked by falling timber. The mules made heavy weather of it. Loads frequently came adrift, and much time was spent in readjusting them and in clearing the path. In three hours we had only climbed 300 metres. At length we emerged on to the crest of the Sierra del Norte among the strange, rather freakish vegetation of the lower paramos: large tussocks of coarse grass, grey-green bush, and low trees with broad leathery leaves draped in hanging moss. There was no sign of animal or bird life. The mist hung in wreathing folds.

I had thought the remainder of the route along the crest of the ridge would prove easy going, but we struck an unexpected difficulty: parts of the trail had been worn down into deep narrow trenches, and in these the loaded mules were frequently stuck fast. Two exhausting hours were spent in extricating the mules and carrying the bulk of the loads by hand. In the late evening we made camp at 3000 metres on the northern flank of the Paramo del



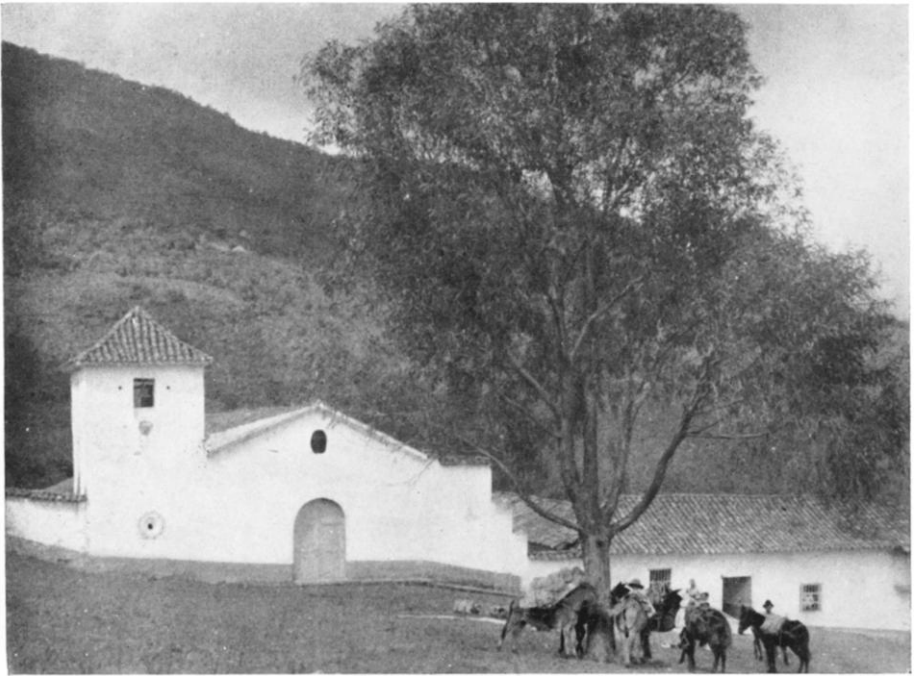
Laguna Negra and south-west arête of La Concha, Cordillera de Merida



Pico Humboldt from a pass above the Paramo de Molina, "Espeletia Moritziana" in foreground



“Espeletia Moritziana” in valley near Laguna Negra, Cordillera de Merida



Small church, Sierra Nevada de Santa Marta

Tambor, overlooking the Maracaibo lake basin, which was covered in a great sea of cloud.

At this camp we experienced typical paramo weather: intense damp, rain, and mist. In general the higher one climbs in the Cordillera de Merida the wetter it becomes. It is only in the dry months of January and February, and perhaps part of March, that one can expect clear weather. In the early mornings the sky was usually clear, and we could see right away to the Maracaibo lake, but by 8.30 or 9 a.m. the mist came rolling up from the tropical valleys below, and by 10 a.m. we were enveloped, with intermittent rain for the rest of the day. Winds are rarely strong, they are in fact the most windless and silent mountains I have ever seen. Such winds as there are blow either from the north-east or south-west, heavily laden with moisture from the Maracaibo area or from the Orinoco plains. The Paramo del Tambor, "Paramo of the Drum," derives its name from a peculiar booming sound caused by the light north-east wind, which appears to form an eddy in a crescent of the hills. Every night from this camp we could see the curious phenomenon of the "Catatumbo lights," brilliant yellow flashes flickering across the sky, like sheet lightning without thunder. They are said to be caused by some form of gas emanating from the Catatumbo river, in the country of the Motilones Indians.

The only species of *Espeletia* collected on Tambor was *E. neriifolia*, the type species of the genus, of shrub habit with broad leathery leaves. But the common *E. Schultzii* appears to flower here earlier in the year. In other respects Tambor proved an interesting collecting ground: some fine material was obtained of the rare *Centronia pulchra*, known locally as the "Mortino," a new addition to the Kew Herbarium. This beautiful tree, with silvery-grey bark and brilliant electric blue and petunia-red flowers grows to a height of some 30 feet in sheltered ravines among thick bush. It is extremely localized. A new species discovered here was *Geranium Tracyi*,¹ of prostrate growth, with delicate pink and white flowers. *Gnaphalium pararmorum* was also an addition to the Herbarium. Other specimens were *Arcytophyllum caracasenum*, *Eupatorium theifolium*, and *Liabum megacephalum*.

We returned to Merida on August 31. Our Chinese cook, who had proved utterly useless on the paramos, now returned thankfully to Caracas. In his place we engaged an Andino who, although he laid no claims to being a good cook, was more suited to mountain conditions. Our muleteer, a *Mestizo* with the same dour character as the mules themselves, had worked well and we re-engaged him for a further tour. Several days were spent in drying and making notes on the plant collection. The humid climate proved a trial, as mildew spread rapidly, and we resorted to the stove method of drying specimens.

On September 6 we left for the Paramo de Conejos, due north of Merida, starting from Egado as before. The first day we followed a steep trail up through the foothills, passing among groves of bananas and coffee bush, with patches of woodland thick with ferns and creepers. Upwards of 600 species of fern are found in the Merida district alone. Here and there we came on a tiny farmhouse, with conical high-pitched roof of thatch. The people of these

¹ Described in *Kew Bulletin*, 1941, p. 219.

parts, of mixed Spanish and Indian descent, are extremely poor and subsist on the barest minimum; 80 per cent. are illiterate and 75 per cent. diseased or suffering from under-nourishment. And this in a country which is the third greatest oil-producing area in the world, and which, until the present war, had no foreign debt. Oil is master, agriculture and other industries are neglected, and the peasants remain backward. The cost of living is extremely high, so that a peon on a wage of £2 per week can be near starvation. Rice, a basic item of diet, is all imported, with heavy duties.

Leaving the cultivated area we climbed steeply through open bush and woodlands, and in late evening pitched camp on the edge of the forest belt or *monte*. September 7 was a wearisome day. We had hoped to get through the monte and reach open paramo, but the trail was narrow and deeply trenched, and throughout the entire day we worked with machetes and stakes, having no other digging tools, to cut a way through. Camp was made in the monte with some difficulty. The following morning we emerged on to the paramo and climbed the flank of the Sierra del Norte. Merida could be seen shimmering in a heat haze 1500 metres below. The Paramo de Conejos consists of two main lateral ridges along the crest of the Sierra del Norte. There are signs of former glaciation, with rounded outcrops of rock, broad U-shaped valleys, and morainal ridges. We camped at 4000 metres and were fortunate in finding pasture for the mules. Camping on the paramos for any length of time has its own problems. Mules must often be sent down to lower levels owing to lack of grazing. Fuel must be brought up from below, for the scrub in the ravines is rarely dry. Suitable camp sites are few, because the rare patches of flat ground form catchment basins and are generally waterlogged. The worst enemy is the constant damp, and double or even treble ground sheets of heavy material are a necessity. The paramos are for the most part uninhabited, and one cannot rely on obtaining any supplies, though potatoes and milk can occasionally be obtained from an isolated cattle farm.

The *Espeletiae* on Conejos were abundant and in full bloom. September and October proved in fact to be the best collecting months, although scattered plants can be seen in flower nearly throughout the year. It was evident that the plants need some protection for maximum growth, and only reached their full height of 6–8 feet, with characteristic woody stems, in ravines or sheltered gullies. They grow in an acid soil containing no limestone. The stems of *Espeletiae* are resinous, and in that respect form the counterpart of the conifers of more northern latitudes; we had hoped to use these stems for fuel, but they need a long period of seasoning before they are of any use. The resin is used as incense in the churches of the Merida district, and by some of the Indians for stopping their teeth. The Venezuelan Government has recently experimented with the manufacture of paper from the long floccose leaves of *Espeletiae*, but as far as I could learn without much success. If any economic use could be found for these plants there is certainly an unlimited supply of material. The vernacular name for the *Espeletiae* is "Frailejón," due to the similarity of the plant, with its dense tomentum of leaves, to a hooded monk. Specimens collected on Conejos included *E. elongata* and *E. atropurpurea*, the two latter both new for Kew. While on Conejos and the surrounding paramos we heard frequent accounts of a

“Frailejón morado,” or purple *Espeletia*, and made vain efforts to track it down. It was no doubt confused with *Senecio tabacon*, a common reddish-purple Composite, not unlike a large Michaelmas daisy. Prominent in sheltered places was *Chaetolepis Lindeniana* (Melastomaceae), a beautiful shrub reaching a height of 10 feet, which with its rose-red flowers resembled Scottish heather grown to a gigantic size. We had received a request from the Director of Kew to collect all species of wild potato that we could find in this part of South America, which is their native habitat, for purposes of investigation into potato diseases and for possible crossing with home-grown species. We tried to enlist the aid of the local population in this search, but with marked lack of success. They regarded the enterprise as singularly futile, and pointed out that they had large stocks of their own for sale, considerably more succulent than the miserable wild tubers.

I wished to make one camp high up on the northern flank of the Sierra del Norte, and on September 14 we moved to the Paramo de Campanerio. *En route* we crossed the Rio Gonzalez, a tributary of the Chama. It was greatly swollen by the rains and treacherous bogs had formed at the water's edge. We had some anxious moments with the mules, who sank almost to their bellies. A long steep climb followed to the crest of the Sierra. One of the mules, the oldest of the string, had already shown signs of sickening, and on this climb he collapsed, evidently affected by the altitude. The loads were shifted to my riding mule. Near the summit ridge we came on a lupin which subsequently proved to be a new species, *L. verbasciformis*; it was 18 inches high, of a beautiful deep blue, with remarkably long and woolly raceme. It was the only specimen we found of this plant during the whole seven months in the Cordillera. The woolly characteristic, a means of preventing too sudden transpiration, is a noticeable feature of many paramo plants, especially in the case of the *Espeletiae* and some of the ferns.

Camp was made at 4100 metres on Campanerio. We were lucky in finding a comparatively sheltered spot, but it was a most uncomfortable camp. Bitter cold and rain prevailed, and at one time or another the whole party was doubled up with *Mal de paramo*, or paramo sickness, an acute form of mountain sickness aggravated by the damp and sudden changes of climate, the symptoms being lassitude, sleeplessness, and loss of appetite, often accompanied by vomiting, back and stomach pains, and feverish cold. It is recognized as a distinct illness by most Venezuelans, and is a great deterrent to visiting the paramos. After this one bout of sickness my wife and I never suffered again. In common with others it has been my experience that the effects of altitude are felt at much lower levels in the Andes than in the Himalaya, a height of 4250 metres in the Andes being equivalent to about 5350 metres in the Himalaya from the point of view of general comfort and well-being. Our muleteer was so ill that he decided it would have to be his last tour with us. He subsequently joined the Merida Police Force and on one occasion was detailed to arrest us for taking a photograph of the police station, a situation which amused him as much as it did us. To complete our discomfort the camp was flooded by a sudden run-off, in spite of the deep drains which were dug round the tents at every camp.

Collecting was continued under difficulties. An interesting umbelliferous

species was *Niphogeton ciliatum*. Apart from the *Espeletiae* the Melastomaceae formed the best material in our collection from the range as a whole. *Espeletia spicata*, an addition to the Kew Herbarium, was found on bare sandy soil. A species of *Echeveria* was found growing on rocky outcrops; a striking little plant with thick fleshy leaves and tiny bell-shaped orange-red flowers, known locally as "Repollo de Montana," the mountain cabbage. Other species found included *Senecio longe penicillatus*, *Podocoma bartsiiifolia*, and *Hinterhubera columbica*, a common white-flowered undershrub used locally as a cure for rheumatism. Also in the neighbourhood we found a splendid plant which proved to be a new species, *Culcitium rex*, with long stems 5-7 feet in height, culminating in tufts of brittle glossy leaves with small pale yellow flowers. This plant is closely allied to the senecios.

Two further camps were made at lower altitudes on the southern slope of the Sierra, where conditions were much better, and, on October 1, we returned to Merida by a good mule track down the valley of the Rio Albarregas, passing through thick forest. The garbled accounts of the Munich crisis which had by now reached Merida almost paled into insignificance beside the more immediate excitement of a shooting affray which had just occurred in the Plaza between the local Chief of Police and the retired Governor. Nobody was hurt, but the police station was slightly chipped, twenty-four shots having been fired in and about the entrance. The Chief of Police had been arrested and was languishing in his own cells.

The rains were still heavy, so we again postponed the visit to the Sierra Nevada and planned a tour to include a number of paramos to the west and south-west of Merida. Supplies were laid in, and on October 12 we left by lorry for La Vega, a small village 12 miles down the Chama valley, where the mules were loaded up. La Vega is in the arid belt, and the heat was stifling. Regiments of cacti dotted the grey-brown slopes; the countryside had a tortured look, withered and dry under a fierce sun. Crossing the Chama by a narrow bridge, we climbed steeply up the southern slope of the valley, which was almost devoid of vegetation and deeply eroded. The belt of thick forest, marking the fringe of the mean cloud level, so noticeable a feature of the slopes above Merida, was here entirely absent, but across the Chama valley we could see the lush green foothills of the Sierra del Norte, thick in vegetation.

Our first objective was Mucutuy, on the southern side of the watershed. Camp was made for a few days in the neighbourhood of Acequias, and on October 18 we crossed the Paramo de Acequias in dense mist and descended by a steep trail to Mucutuy at 1500 metres. Now that we were out of the Chama valley and on the southern flank of the Cordillera, we hoped to find a somewhat different flora, and were not disappointed. The first find was *Espeletia Lindenii*, on the Paramo de Acequias, not previously observed on the Sierra del Norte. The drop to Mucutuy from the paramos was abrupt, and we found ourselves in a network of narrow valleys filled with scrub and interspersed with coarse pasture; the forest was thinner than in the Merida district and considerable clearing had been done by burning. Specimens collected near Mucutuy included *Begonia rubicaulis*, *Begonia meridensis* (new for Kew), *Jaegeria hirta*, *Polygala paniculata*, and a new species of *Clusia*, a fine tree 20 feet high with fragrant white flowers.

I had planned to visit at least one of the small outlying paramos which stand out like islands among the forested hills to the south of Mucutuy. On October 24 we moved camp some 8 miles along the trail leading to Aricagua, climbing the next day to the Paramo de Las Lajas. Either no path existed or our guide for the day did not know of one. The last 1000 feet of the ascent consisted of a violent scramble up a 40° slope thick with bamboos. In the woods below the Paramos we found a most lovely plant, a creeper with fiery scarlet flowers and deep green leaves. It proved to be a new species, *Begonia formosissima*. Also in these woods we found a grove of the white-flowered *Espeletia banksiifolia*, of tree habit, growing to a height of 20 feet; this was the second collection made of the species. The Paramo itself yielded nothing of great interest.

While on this tour we had acquired a certain reputation as doctors, chiefly through a lucky cure of a badly scalded infant. On our return to Mucutuy our reputation had so far advanced that we were waited on by a deputation who implored us to lay a ghost, which apparently inhabited a derelict house and disturbed the village by its moans at night. Much disappointment was registered when we referred the matter to the local priest.

We recrossed the Cordillera by the Paramo de San José, the most interesting finds here being *Espeletia marcescens*, another white-flowered species of tree habit, and *Erigeron blepharophyllus*, both new for Kew. We then took a trail which led in a south-westerly direction along the flank of the range, crossing ridge after ridge running down to the Chama valley and passing through the villages of Pueblo Nuevo, Cambure, and Quirora. We continued as far as the Paramo de Molino. This was a much drier district than that surrounding Merida, the vegetation being coarse and scanty, the valleys for the most part bare and deeply eroded. Few fresh finds were made. Returning by the same route to Pueblo Nuevo we descended to the Chama valley at Puente Real and reached Merida again on November 14.

By the middle of November the dry weather should have set in, but the rains were if anything heavier. There were serious floods in the Valera district and landslides had occurred at several points on the trans-Andean highway. For some days all communication with the province of Merida was dislocated. The Sierra Nevada was enveloped in cloud and conditions there were obviously hopeless for the time being. On November 23 we moved to Timotes, on the eastern side of the Mucuchies pass, whence several paramos could be reached. On this tour we travelled light, taking only two pack-mules, and doing all camp chores ourselves. This was not from choice but necessity, for the servant problem had become acute. We had found the Andinos were loath to do more than one short tour on the paramos, after which they returned firmly to their villages. There is here no reliable supply of willing coolies as in the Himalaya and other mountain regions. The people are 90 per cent. agriculturists, mostly of poor physique, and tend to leave the mountains alone.

Short tours of four or five days were made to the Paramos of Niquitao, Tuñame, and Piñango, with Timotes as a base. *Espeletia spicata* was found on Piñango and also two senecios: *S. Funckii* and *S. nevadensis*, *Funckii* being conspicuous in patches of boggy ground. While in Timotes the bridge over

the Rio Motatán was swept away and we were immobilized there for some days. At the end of December we recrossed the Mucuchies pass to the village of Apartaderos, from which we visited the Paramos of Canoa and Mucubachi.

The inhabitants of the Mucuchies district are of a more purely Indian type than those of Merida, who are largely of Spanish extraction. Some of the outlying villages near Mucuchies, above 2500 metres, are inhabited by pure Indians. They are a light-skinned race, silent and reserved by nature, with straight black hair, of medium height and good physique. They are agriculturists, growing chiefly wheat and potatoes, which they trade with the lower valleys for coffee, sugar, bananas, and other tropical products. Their distinctive dress is the *Chamarra*, a woollen cape similar to the Peruvian *Poncho*, usually brown or blue with a scarlet lining. Such knowledge as we have of the ancestors of these Indians has been obtained from buried ruins and sepulchre caves, usually situated high up in the paramos. Some religious significance appears to have been attached to these remote, uninhabited regions. Stone totems have been found in the sepulchre caves, in the shape of eagles' wings, also skeletons, usually placed in a sitting position, together with various utensils and food to last for several days. Much of the investigation has been carried out by the late Febres Cordero, of Merida. There is undoubtedly a great deal still to be learned about these people. It appears that they had not reached a very advanced stage of civilization at the time of the Spanish Conquest, in no way comparable with that reached by the Incas or Aztecs, with whom they do not seem to have had any communication. They were agriculturists, planting crops of maize, yucca, beans, and potatoes. They made baskets, spun and wove cotton, made vases of baked clay, and there are traces of carpentry. They worshipped the Sun and Moon and were governed by their priests; their idols were crude, made of clay, and contained a stone which caused them to ring when shaken, the sounds being interpreted by the priests to reveal the wishes of the deities. We made a small collection of these idols on behalf of the Cambridge Ethnological Museum. The modern Indians have long been converted to Roman Catholicism, although, as the priest of Mucuchies told us, religious observance has to be leavened with a number of fêtes and festivities, in which fireworks play a prominent part, in order to make it acceptable to them. There were formerly about fourteen separate tribes, but the distinctions have now been lost. The language had certain affinities with that of the Chibcha Indians; traces of it can be observed to-day in many place-names throughout the Cordillera de Merida, more particularly in the common radical *Mucu* (Place) in such names as Mucuchies, Mucubachi, Mucutuy, etc. The modern Indians speak Spanish only. One custom that has been inherited from these Indians is the chewing of *Chimo*, a concoction of tobacco juice and *Troma* (Salts of Urao), a sticky black substance which to the uninitiated both looks and smells nauseating. It is said to have a beneficial effect on the teeth. The salts are found in a lake near Lagunillas, in the Chama valley, the only other known source being Fezzan, in N.W. Africa; these salts are antiseptic and anti-spasmodic, and have a slightly narcotic effect.

By the beginning of January 1939 the weather showed signs of becoming more settled, and on the 10th we left for the Sierra Nevada, intending on this

tour to make an ascent of one of the high peaks if time and conditions permitted. Mountaineering as such did not figure in our programme, but this was an opportunity not to be missed. We had heard of a good route leading from Mucuchies up to the eastern end of the Corona group. After two days on the road from Merida to Mucuchies, with all seven mules, we struck off southwards, crossed the Paramo del Oro, and on the second day dropped down a steep wooded valley to the little village of Los Arangures. Here a guide was obtained who knew of a good camp site within reach of the snows. On the morning of January 14 we ascended a narrow ice-worn valley running up to the north-west. The towering mass of the Pico Humboldt blocked the head of the valley. After 5 miles we branched N.N.W. up a side valley and reached the Paramo de Molina in the early afternoon. This paramo, botanically unexplored, is not to be confused with the Paramo de Molino to the south-west of the Sierra Nevada. Conditions here were excellent, a perfect camp site on a small plateau close to a stream, ample supplies of fuel, and dry weather. At night the thermometer dropped on an average 3° below freezing-point. We dismissed the guide, set the mules loose to graze (the pasture being of good quality) and settled down for a fortnight's stay. A new species of senecio *S. venezuelensis*, was discovered, 3-5 feet in height. Several species of *Espeletia* were also found, the most conspicuous being *E. Moritziana*, which grew in dense groves in a sheltered ravine, some magnificent specimens reaching a height of 10 feet.

Two abrupt ridges separated our camp from the snow massif to the west. On January 21 we prospected for a line of approach and crossed the ridges by two easy passes, from the second we looked down on the expanse of the Laguna Negra, with a superb view of a great amphitheatre of peaks beyond, including the snow-capped Corona group which consists of the Pico Humboldt (4945 metres) and Pico Bonpland (4894 metres); while La Concha (4922 metres), with its jagged arêtes, rose steeply from across the lake to the south-west.¹ The Pico Humboldt was the nearest summit, but direct approach to it from our position was cut off by an impassable cliff on the east side of the Laguna Negra. From the farther west shore of the lake a valley led up to the south-west, swinging abruptly south. We could not see the snout of the Humboldt glacier, but the valley seemed to provide a possible route. Returning to camp we waited a day for fine weather and made the attempt on the 23rd. The descent to the Laguna Negra and the scramble round the north shore proved to be a stiff obstacle race among dense bush and boulders, and took an undue amount of time. All this area bore signs of former glaciation, and the depression of the Laguna Negra was evidently at one time a huge corrie or cirque. An easy march over open ground up the valley from the west shore of Laguna Negra brought us to the small Laguna Verde, at the foot of a 100-metre wall of smooth terraced rock from which the Humboldt glacier had evidently been in rapid retreat. Threading a way up through the narrow gullies in this rock wall, with one short pitch where it was necessary to rope up, we reached the glacier snout. The surface here was only slightly crevassed, and almost level. In its higher reaches the glacier was heavily crevassed, but a route could be clearly traced, and Pico Humboldt seemed within our grasp.

¹ See map, *G. J.* 97 (1941) 74.

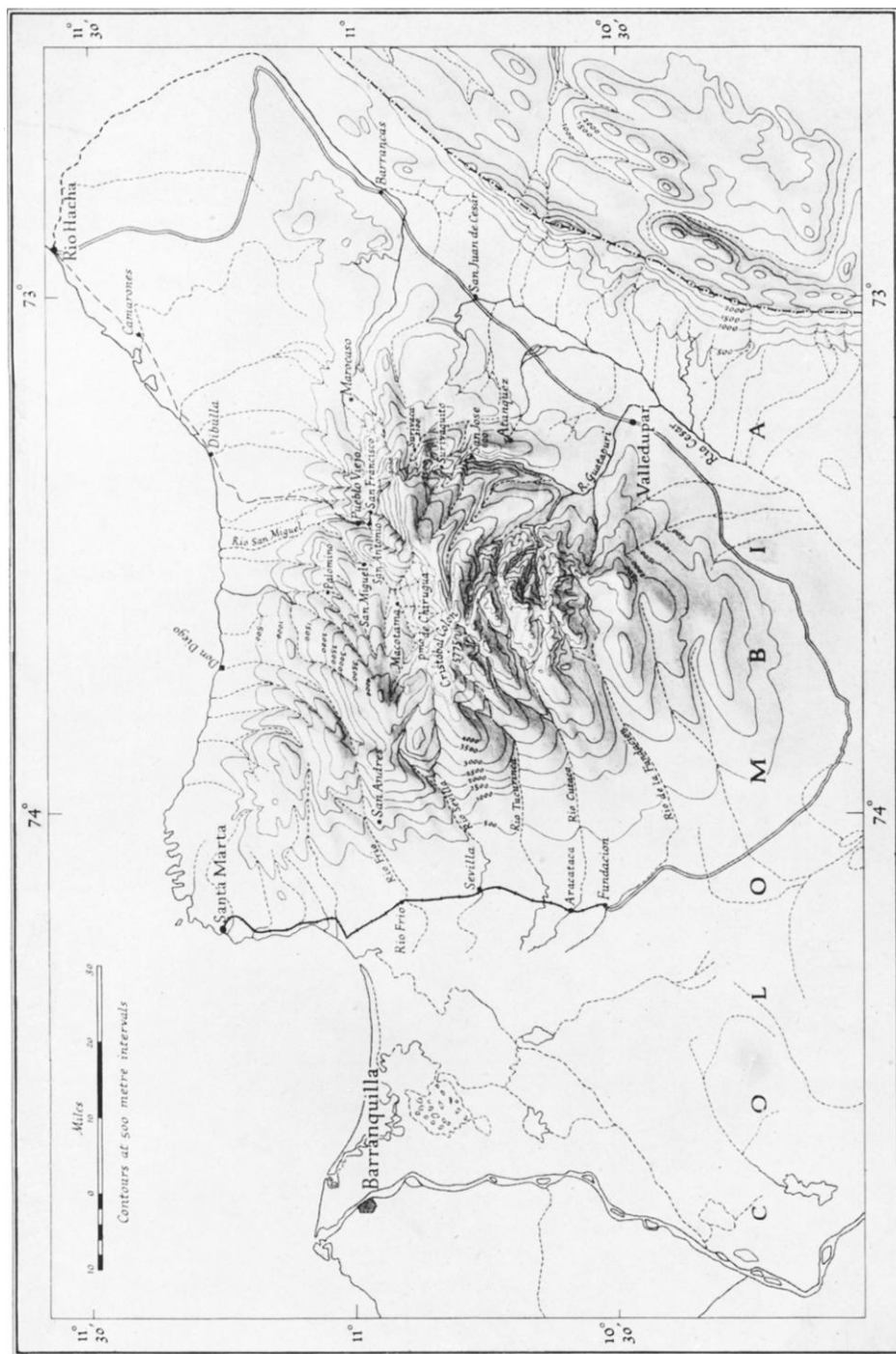
But after proceeding for half an hour thick mist enveloped us, and, as it was already early afternoon, we decided to turn back. We reached camp again fourteen hours after setting out. The Pico Humboldt was climbed by Dr. Jahn in 1911 from the south side. My wife and I were disappointed not to have reached it by this new route from the Laguna Negra.

The weather was unfavourable the next few days, and on the 29th we struck camp, crossed the Paso de Molina to the north and descended by a steep path, extremely awkward for loaded mules, to the Quebrada Mucui. Following this valley down we reached Tabay, in the Chama valley, the next day, and Merida the following morning. At the hotel we were fortunate in meeting Mr. A. E. Gunther, who, with Dr. Carl Weiss, had just made the first recorded ascent of Pico La Concha. Also staying in the hotel was Mr. A. H. G. Alston, who was making a botanical collection on behalf of the British Museum.

The next few weeks were spent in preparing and despatching specimens to England, and in making arrangements for the move to the Sierra Nevada de Santa Marta in Colombia. During this period I made a short trip alone to the Paramo del Tambor to collect seeds of *Centronia pulchra*, that vivid flowering tree, but I met with disappointment. Although it was now nearly six months since the time of full flowering, the seeds were not yet ripe. On my return from the paramo towards evening I missed the path and stumbled into the debris of a recent landslide, still in an unstable condition, and spent an anxious hour or two threading a way in mist and darkness through slabs of crumbling earth and rock.

On March 11 we left Merida and made a mixed journey by bus and train to Santa Bárbara, and thence by paddle-steamer to Maracaibo. Information about the Santa Marta range and its approaches was scanty. In 1925 Mr. A. F. R. Wollaston had gone up from Dibulla on the coast and made what was really a reconnaissance of the northern or seaward slope. At Merida Dr. Carl Weiss told us that the best approach would probably be from Rio Hacha, a small seaport on the fringe of the Goajira Indian territory. Much of the interior of the range was unmapped. We planned to cross the range to the south, making a route survey, and settle in a village for some weeks for collecting. In this part of South America, if one is relying on local transport, the success of any plan is largely a matter of luck, and delay is inevitable. One must take one's chance. We decided at any rate to make for Rio Hacha, and this meant that we must first cross the Goajira plains.

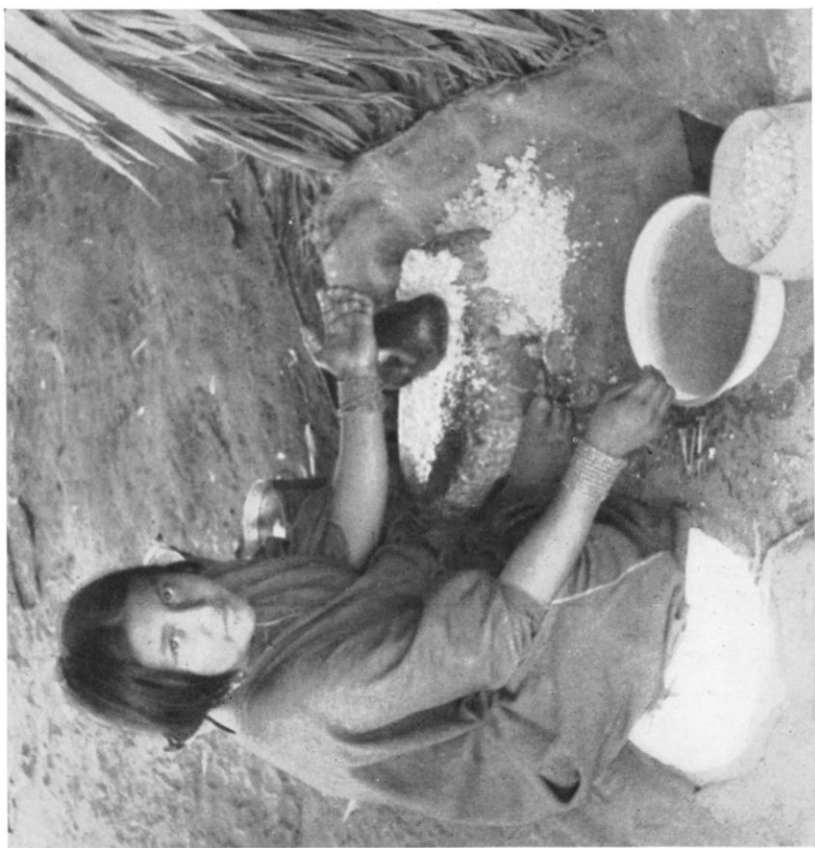
A lorry was hired in Maracaibo to take us as far as the Colombian frontier post of Maicao, and two water tanks were fitted. The Goajira Peninsula is an area of some 6000 square miles of cactus desert and grass plain, with rare water-holes and no large rivers. It is policed by a few scattered government posts. We left Maracaibo on March 7, spent the night at the village of Carrasquero, by the Rio Limón, and reached Maicao the next day. This journey is only possible for vehicles in the dry season, from November to April. There is no road; the route has been evolved by the simple process of a succession of lorries forcing their way through the scrub. It was one of the roughest tracks I had ever seen, the mud having dried hard in a series of ripples. Lorries are usually worn out after one season's work. It is only in



The Sierra Nevada de Santa Marta



Goajira Indian



Goajira woman pounding corn

the last fifteen or twenty years that "Civilisados" have entered the country of the Goajira Indians.

We camped at Maicao for a few days; although botanical collection was continued, nothing of great interest was found, the vegetation consisting chiefly of thorn scrub, cactus, and coarse grass.

The Goajiras are semi-nomadic within the confines of the peninsula. They have a few permanent villages, rarely of more than half a dozen huts, and other more temporary settlements. When a water-hole fails, as happens often in the dry season, the whole settlement moves to a fresh site, usually retaining the place-name of the previous site, a practice which makes any map purely speculative. Fights frequently occur over the possession of water-holes, but the Colombian Government has recently set up a number of wind-driven pumps working at a deeper level, thereby lessening the chief cause of friction between tribes. There are numerous tribes in this comparatively small area, for a Goajira tribe consists only of close relations. Their few laws are administered autocratically by the head of the tribe, who is often a woman. Like many South American Indians they are instinctively communistic, in a non-political sense, and tend to pool resources. Their chief wealth lies in vast herds of horses, cattle, and goats. They are almost unique in the north of South America in being plainsmen and cattle herders, the majority of Indian tribes being mountain or jungle dwellers. The grass of the plains, which appears coarse, is apparently excellent pasture, and the Goajira horses are of a particularly fine strain, with some Arab blood, evidently descended from horses imported by the Spaniards. They are much sought after by Venezuelans and Colombians, and fetch a high price in Maracaibo. The Indians, with sound business sense, will only part with the geldings. Some of the coastal tribes live by fishing, from small dug-out canoes. Turtles are caught, and the shell is traded in Santa Marta. Baroque pearls are also found, but the trade, once thriving, has declined with the introduction of cultured pearls. Cultivation is almost non-existent, and grain an imported luxury; the Indians' diet consists almost entirely of meat and milk products. Combined with their strenuous existence, this diet has given them an amazingly fine physique. They are a virile independent people, and show none of the apathy of so many South American Indians. Their birth-rate is said to be increasing. We found them hospitable and welcoming; presents are expected and exchanged as a matter of course, and must be given to every member of a settlement, and not only to the headman. Tobacco is appreciated, and we had brought a large supply of cheap cigars. It is said that if you meet a party of Goajiras, and they ask for tobacco, it is better to say you have none at all, in which case they will probably give you some, rather than to make gifts to some members of the party, leaving the others empty-handed, for then you may expect trouble from those who have received as well as from those who have not.

The Goajira huts normally consist only of a roof and poles, open on three sides, with a tiny enclosed shelter at one end. The thatch is made from cactus pith, dried and split into convenient strips. Scorpions and snakes abound in the Goajira peninsula, making it unsafe to sleep on the ground, so it has become the land of the hammock. The native hammocks are also made of

cactus fibre, with a wide mesh. The cactus is to these Indians what the date palm is to the Arab, and they have earned the name of cactus-eaters, from their custom of eating the small purple fruit of the cactus, said to be quite succulent.

Much of a male Goajira's day is spent in fashioning arrow heads, heavily barbed. The war-arrows are poisoned with a concoction of fermented scorpions and snakes, and are treasured possessions, so much so that if a Goajira only wounds his enemy he will usually track him down and forcibly extract the valuable arrow head. Metal was formerly scarce, but the advent of the motor lorry has provided a ready supply, and not only from scrap: hub-caps, mudguards, and other parts have been found delightfully detachable when the owners are away or sleeping, and rather naked-looking trucks are quite a common sight in the plains.

For a primitive people the Goajiras are peculiarly lacking in spirit-worship, superstition, or ritual. Their nomadic existence precludes cumbersome idols or totems. Drought, sickness, birth, and death are regarded as inevitable as the coming of night and day. A certain all-pervading spirit, called Yoruha, apparently lacking in personality, comes like a wind, they say, bringing changes of weather or of fortune. They have however great respect for the dead, and keep certain carefully guarded burial places, which cannot be visited by night.

The origin of the Goajiras is still something of a mystery. In customs, physique, character, and way of life they are markedly different from neighbouring Indian tribes. It is possible that they are a remnant of the now extinct Carib race, who inhabited the coastal regions of northern South America, and penetrated far up the rivers.

Two activities have lately benefited the Goajiras materially: smuggling, which also occupies a floating population of Mestizos, is carried on extensively into Venezuela. The goods, chiefly silk and tobacco, are landed by small sailing boats on the Goajira coast from the neighbouring Dutch colonies of Curaçao and Aruba, where duties are only 3 per cent., and run across the border by night, either by motor-lorry or mule train. The police on both sides are kept very busy. Only a small proportion of Goajiras engage in the business on a large scale, but those that do are extremely prosperous. One whom we met had done so well that he had sold all his cattle and invested in three motor lorries. The Indians have a distinct advantage in that they are exempt from carrying passports. A more legitimate trade in the pods of the divi-divi tree, a species of acacia, occupied a large number of Goajiras just before the war. A German firm had discovered that these pods were of great value in producing fast colours in dye-work, and a freighter took a monthly cargo from Rio Hacha.

The comparatively peaceful condition of the Goajira Peninsula does great credit to the Colombian Government, who have adopted a form of colonial administration in this outlying territory. The police control is effective, without encroaching on the independence of the Indians, who are left free to carry on their accustomed way of life. There is no exploitation and the Indians pay no taxes. In the summer of 1939 some minor riots occurred, and a few Colombian police were killed, but such troubles are infrequent. The

chief difficulties of the police lie in the control of the more sophisticated fugitives from justice who resort here from other parts of Colombia.

At Maicao we enlisted the services of a much-travelled Puerto Rican named Ramos, who wanted to visit the Santa Marta range. He had no references, such things are unknown in those parts in any case, but we took a chance on him. For some weeks he was a loyal and enterprising servant, and made himself extremely useful to us as cook and general factotum, until he landed himself in gaol as a result of a brawl with the police.

A short day's run by lorry on March 28 took us to Rio Hacha, one of the earliest Spanish settlements on the Caribbean coast, founded in 1548, and once a port of some standing, but now a sleepy, rather ramshackle little town. On inquiry we learned that there was no practicable approach to the Santa Marta range from Rio Hacha (later found to be incorrect), but that the best route lay from Fundación, at the foot of the range to the south-west, and the terminus of the railway from Santa Marta.

After a few days' delay we obtained deck-passage to Santa Marta on a small coastal trading-boat. There we were informed that there was no route either from Santa Marta itself or from Fundación to the Sierra Nevada, but that there was definitely a track from Valledupar, to the south-east of the range, where mules could be obtained. Our expedition seemed to be rapidly developing into a round trip of this elusive range. Local travel in this part of Colombia by bus and boat involves the maximum of discomfort, and we were fast becoming jaded.

Fortunately, after an unhappy bus ride from Fundación, our search was rewarded at Valledupar. Even here, barely 10 miles from the foothills, it was difficult to obtain much information about routes, but we learned that the small village of San José could be reached in two days, and from there a track was believed to cross the range to the village of San Antonio on the seaward side. Valledupar lies in the plains of the Rio César and the inhabitants, mostly Mestizos, have little contact with the Arhuaco Indians of the Sierra de Santa Marta.

Mules were hired for the stage to San José, and on April 12 we set out. The first day we rode in sweltering heat through dry scrub and cactus-covered plains, later reaching a more broken country of low, barren hills. Early on the second day, after a steady climb, we reached San José at about 600 metres, in a country of abrupt grass-covered hills, with thick bush in the ravines. F. A. A. Simons visited San José in 1878 (cf. *Proceedings* R.G.S. 1 (1879) 689-94). It was at that time, according to his report, an Indian village established by Government order with a population of about one hundred and twenty. It is now inhabited by a few Mestizo families, who have migrated there for reasons of their own, usually to evade the police, while the Indians have retired to villages higher in the mountains. This encroachment by the Mestizo population has proceeded gradually in recent years throughout the Sierra, but they rarely live higher than 1000 metres owing to the cold. Above that a purely Indian population is found.

At San José we contracted with a Mestizo, who had some influence with the Indians, for twelve oxen to carry our baggage across the Sierra. The trail was said to be difficult and unsuitable for loaded mules. San Antonio, we were

informed, could be reached in four days. A week was spent at San José while the baggage animals were assembled.

Small parties of Arhuaco Indians came in to trade. There is no doubt that these Indians are a dying race; their numbers have decreased rapidly in the last twenty or thirty years, and there are now probably not more than two thousand or three thousand in the whole Sierra. We heard that thirty years ago they had suffered severely from an epidemic, apparently influenza, which killed off one in ten of the population. These Indians are sometimes known as Kogis, but the term is mainly confined to the western and southern sides of the Sierra. The Indians recognize numerous tribal sections among themselves, but the differences are in fact slight. They are a small race, the men being rarely more than 5 feet 4 inches in height, the women about 5 feet. Though small and of apparently feeble physique, they can yet travel long distances on foot in their own mountains. They rarely descend to the plains, or to Rio Hacha and Santa Marta, where they find the heat insupportable. Nor do they have any contact with their neighbours the Goajiras, for whom they have a wholesome respect. It would be difficult to find two tribes, differing so completely in every respect, and yet living in such close proximity.

The Arhuaco dress usually consists of knee-length trousers and a long jacket, usually white and sometimes with a purple stripe. The cloth is either cotton or made from fibre produced from the agave tree. They usually carry two or three small bags, known as *Muchillas*, slung round them, while the women wear necklaces of coral and shells. They are much addicted to the custom of chewing coca, the plant from which cocaine is produced. The leaves are mixed in a small gourd with saliva and lime made from crushed and calcined shells, producing a white paste. The mixture is constantly stirred with a stick, from which it is sucked and chewed. Only the men indulge in this custom. There is no doubt that it has increased their naturally apathetic character. The coca plant is cultivated by the Arhuacos, and nearly every village has its own carefully tended plantation. The Arhuacos do not allow inter-marriage with the Mestizos, and this must lead to a good deal of in-breeding in such a small population, perhaps causing partial sterility. The presence of the Mestizos in the Sierra has had a deleterious effect on the Arhuacos. Like most American Indians they go to pieces the moment they touch alcohol, and the local rum produced by the Mestizos is a fatal attraction. They will barter their produce and cattle for one night's carouse, and be truculent and morose for days afterwards. When sober, the Arhuacos have a certain quiet, rather sad dignity; they are then friendly and easy to deal with. They have great pride of race; when speaking to us they frequently referred to themselves as *Indigenos*, the original inhabitants of the country, as opposed to the newcomers of Spanish blood.

On April 19 the oxen were at last ready, and we left San José for Surivauquito, the first stage on the way to San Antonio. Simons, in 1878, continued up the valley of the Guatapuri river from San José, up to the paramo of Chirugua, which he crossed to Macotama on the north side of the range, and so to the large village of San Miguel. We now broke fresh ground, our route climbing steeply directly from San José up a ridge flanking the Guatapuri on the east. The Sierra de Santa Marta rises from the coast to over 5700 metres

in a distance of little more than 30 miles, and drops almost as sharply on its landward side. It consists of a central snow massif running roughly east and west, with ridges radiating outwards in all directions. It is in effect rather like a gigantic open umbrella, and to traverse it one must cross rib after rib, dropping steeply to the valleys between. In the course of our journey to San Antonio we had to cross two of these main ribs. The Spaniards first crossed the range from the coast in 1573, returning with gold from the plains of the Río César, but there is no record of the route they followed. They speak of high mountains and great cold on the way. A complete survey of the range has not so far been made. In the early summer of 1939 the American Cabot Colombian Expedition carried out an aerial survey of the central high part of the massif and the southern slopes. Owing to the misty conditions which so often prevail the mapping of the entire massif was not attempted. The sketch-map accompanying this account is based on the Cabot Expedition's map (*Geogr. Rev.* 31 (1941) facing p. 639). From San José we ran a compass traverse to San Antonio, to connect with Wollaston's 1925 route (*Geogr. J.* 66 (1925) 97). The first day's march was cut short owing to a mishap with one of the oxen: crossing a steep valley one of the loads collided with a rock, and a stray splinter caused the animal to run amok. He disappeared into the bush, strewing his load on all sides. Fortunately, no great damage was done, but some time was spent collecting scattered pieces of equipment.

The climb was continued early next day, at first through open bush, and then steeply through forest. After some 8 miles we reached open country, the beginnings of the paramo, and following the crest of the ridge reached the small village of Surivaquito, at an elevation of 2500 metres. This was the first Indian village reached on this route; it consisted only of a dozen huts, quite half of which were uninhabited. This was the case in most of the Indian villages we visited; it was not entirely due to the decreasing population, but partly to the Indian custom of moving from one village to another for a few days, so that at times a village may be crowded out and at others almost deserted. Families often own two or three huts, each in a different village. The Arhuaco huts are usually circular, 8-15 feet in diameter, made of mud and wattle on a framework of wooden posts, with a conical thatched roof. The roof is usually made on the ground and lifted bodily into position.

As we had good quarters at Surivaquito a day was spent collecting in the neighbourhood. The only species of *Espeletia* found was *E. glossophylla*, and it appeared to be the only species growing in this part of the Sierra. Among the undershrubs *Hinterhubera columbica* was common.

On April 22 we ascended over open paramo to the Paso de Surivaca (3500 metres), which we crossed in thick mist, and dropped by a steep path through light forest to Surivaca, a larger village of twenty huts. One of the huts was much larger than the others, with a collection of broken pottery and tattered flags on the apex of the roof. This was the house of the *Mama*, who has a position equivalent to a witch doctor and holds great authority over the tribes. A *Mama* is resident in each large village; his house is strictly guarded and may not be entered except by certain attendants. The *Mama* himself is rarely seen; he apparently spends most of his time in the house, but on occasions will make a tour of the district. On these tours he visits certain significant

points, usually the summits of hills or the heads of valleys, which are marked by flat stones to form seats, some of them with a back rest, and often placed in a circle. In front of each seat groups of small round white stones are placed, the number of the stones indicating the rank of the occupant, three stones being the largest number in a group. Meetings are held at these points, and petitions made to the Mama, who also blesses the crops and propitiates the gods to send fair weather. It is said that sacrificial rites are held, and dried blood has been seen on the stones. These stone-circles are also used as meeting places by the village elders, a sort of primitive agora. One such meeting-place lay just outside the village of Surivaca, and I was able to photograph it secretly while the mules were being loaded, for the Indians did not like one to approach too close. It was difficult to obtain many details about the functions of the Mama or the Arhuaco religion, as the Indians are very secretive on the subject and the Mestizos did not know much. The latter told us that at certain seasons of the year, in the spring and at harvest time, they had from a distance watched dances at the stone-circles when the Indians wore collars and chains of gold and appeared to be playing with a large ball of solid gold, which they tossed in the air. This gold ball may have some connection with the worship of the Sun-God. The houses of the Mamas were also said to contain gold ornaments. Gold is not now found in the Sierra, and it is evident that the golden objects are relics of the extinct Tairona Civilization, a much higher culture which formerly flourished in the Sierra. The gold may have come originally from the plains of the Rio César. The office of the Mama, we were told, is hereditary, and each prospective candidate undergoes a long period of training, during which he may not touch meat or salt, and eats only rice and vegetables. Every Arhuaco, male and female, wears a small cord round one or both wrists, placed there by the Mama at birth. The purpose of this was obscure, but appeared to be connected with initiation into the tribe. Catholic missions have long been established in the Sierra, but, except in the south-west, they appear to have little effect. There are small churches in one or two of the larger villages on the seaward slope, visited at long intervals by Dominican monks from the monastery at Rio Hacha. Baptisms and marriages are carried out, but as soon as the visiting priest has disappeared the Indians revert to their native practices.

At Surivaca there was another hut almost as large as the Mama's, but oblong in shape; this was the *cansamaria*, the communal sleeping quarters of the men of the village, married and unmarried. Husband and wife never sleep in the same hut. The remoter settlements, inhabited by single families, consist of pairs of huts one being the woman's, where the cooking is done, the other the man's. Meals are usually eaten at the threshold of the woman's hut. In the *cansamarias* a fire is kept going night and day. The Indians sleep lightly, like wild things, in short snatches of two or three hours, waking at intervals to talk and tend the fire.

Surivaca stands on a small plateau at the junction of two valleys, a path leading down the main valley thus formed to San Juan de César to the east. Our route to San Antonio followed the right bank of a steep narrow valley to the north-west. The path was very rough and at times almost non-existent, and we had some difficulty negotiating the worst stretches with our bulky



Arhuaco Indians, with "muchillas"



Arhuaco Indian from San Francisco, Colombia



Arhuaco village, Sierra Nevada de Santa Marta



Loaded mules crossing river near Valledupar



Indian bridge at Pueblo Viejo, Colombia

loads. After some 5 miles we crossed the valley to the left bank and climbed even more steeply to the pass of Nabulgakha. This pass lay at 4000 metres just above the extreme limit of vegetation. On the farther north side ice-worn rock ridges fell away precipitously to a wide cirque, at the bottom of which lay a small lake. The descent lay over rock slabs; it began to rain heavily and on the slippery rock the oxen made slow progress, often having to be assisted down inch by inch, held by the tail as well as the head. As a result we did not reach a village that night, but camped on a tiny plateau near the head of the valley. It was a difficult day's march. The Indian ox-drivers gave trouble throughout the journey; they would not work unless given a large gourd of rum, carried by the leading driver. Frequent halts for refreshment were made during the day, and towards the end of each march the oxen were usually left to fend for themselves, while their drivers raced ahead, like hounds on a scent, to catch up with the leader and join in the evening's carouse. My wife and I, bringing up the rear, often spent the last few miles rounding up stray oxen from the hill-side. It was a haphazard method of progress, but apparently the only one with these irresponsible people. The Mestizos told us the only way to get the Arhuacos to do a job was to make them drunk, when they would work without being aware of it.

After another day spent collecting, we continued down the valley of the Rio Ancha and reached the large village of San Francisco at midday on April 25. This village, of over one hundred huts, was situated on the right bank at 1500 metres near the upper limit of wooded country. The Indians here wore a head-gear peculiar to the village, a wide-brimmed straw hat with a high crown. The Arhuacos as a rule either go bare-headed or wear a small woven cap rather like a balaclava helmet. At San Francisco we were met by a party of Mestizos who had heard of our coming, and a lunch of plantains and rice was laid out on banana leaves in one of the huts. Their welcome was not entirely disinterested as they had brought mules which they offered to hire to us at an outrageous price for the rest of the march to San Antonio, and there was much chagrin when we refused. From San Francisco a good track led down through light woods, thick with ferns of several species; the open stretches of the hill-side were dotted with Easter lilies.

San Antonio, we found, was only the shell of a village, having been burned several years ago by the Indians, during a dispute with the Mestizos. The inhabited village was Pueblo Viejo, 2 miles farther on. The population is now purely Mestizo, the Indians coming in only to trade. We hired a small hut and decided to make our base there for the next few weeks, as it was the junction of several tracks. Pueblo Viejo lies at the upper limit of the forest zone, at a little over 1250 metres. There are four main vegetation zones in the Sierra: first an arid belt, extending up to about 300 metres with little rainfall, and thickly covered with cacti and xerophytic scrub; secondly, a belt of dense tropical forest, up to about 1250 metres; then a rather drier belt of light woods, shrubs, and coarse grassland up to 2300 or 2450 metres, this belt being inhabited by the Indians; and finally the paramos, extending to the limit of vegetation at 4250 metres. These zones are of course further subdivided.

Our stores were now running low, and as there was little to be obtained at Pueblo Viejo beyond plantains, sugar, and a few eggs and maize meal, we

sent Ramos down to Dibulla on the coast, a day's journey, to buy supplies. We waited expectantly but he failed to return. We decided to give him a few days' grace, and on April 5 set off on a week's tour to San Miguel and Macotama, villages visited by A. F. R. Wollaston in 1925, taking three baggage-oxen and two Mestizos.

At San Miguel we had a rather mixed reception from the Indians. There were the usual requests for rum, and when these had been satisfied we were told we were quite welcome to continue our journey up the valley, but on no account were we to visit or photograph a certain lake in the paramos, above Macotama; this, they said, was the home of the rain-goddess and the source of water for the whole of Colombia. If we photographed it the rain-goddess would be disturbed and there would be drought for several years to come. Further, would we inform the Government at Bogotá that they and the Mama were doing all in their power to keep the supply going by appeasing the goddess. We assured the headman we would leave the lake strictly alone.

San Miguel is a large village of about one hundred huts, surrounded by a wall with a gate at either end. Only about one-third of the huts were inhabited, the epidemic of thirty years before having been particularly severe here. The route from San Miguel to Macotama is marked by flights of rough stone steps, obviously of great antiquity. The blocks are large and much worn. They were noted by Wollaston on his journey, and are said to be relics of the T-Civilization. There are also signs of former irrigation canals. The whole area must certainly have been in a much more prosperous state than it is now. The Arhuacos of to-day could never undertake such works.

We spent a few days collecting above Macotama, in typical paramo country, and returned to Pueblo Viejo on May 13. There was no sign of Ramos. Shortage of supplies and cash had now become acute, and we decided that I must make the journey to Santa Marta and back, where we had arranged credit, while my wife remained with our possessions at Pueblo Viejo. It was a difficult problem, but it was preferable for her to remain in a friendly village rather than to travel alone. We planned on my return to make the journey to Palomino (previously visited by Wollaston), and continue west along the seaward slope of the Sierra by a path which we were told came out near El Frio on the Santa Marta-Fundación railway. This path was said to be quite unsuitable for baggage-animals of any sort, and the journey would have to be made on foot. The Arhuacos do not as a rule carry loads, and it looked as if some diplomatic work lay ahead.

I left for Santa Marta at the end of May and did not return till the middle of June, after a journey which ranks as the most acutely uncomfortable in my life. At Dibulla there was considerable delay in finding a west-bound boat. The boat, when it was ready, was a large motor dug-out loaded nearly to the gunwales with bananas, on which the passengers crowded, sometimes lying on top of each other. Sleep was impossible. On the return journey we narrowly escaped shipwreck; a heavy sea got up and a landing was made on the coast with difficulty at 2 a.m. I arrived back at Pueblo Viejo in a rather exhausted condition. Two days later both my wife and I went down with fever, apparently a form of relapsing fever. After this we were quite unfit for strenuous travel for some weeks, and abandoned the journey to Palomino.

When we had recovered a little we made the journey to Santa Marta in July and spent two weeks convalescing.

To all intents and purposes this was the end of the expedition. At the end of July we travelled by air to Bogotá, and from there made a short tour of ten days to the Tolima range in August, via Honda and Fresno. *Espeletia Hartwegiana* was collected on the Tolima Paramos, but there were no fresh discoveries, although the collection profited by some rare specimens. The outbreak of war curtailed our activities and we took passage to England from Buenaventura at the beginning of September.

In conclusion, I should like to express my thanks to the authorities at the Royal Botanic Gardens, Kew, for their constant cooperation and for their determination of the species collected.

DISCUSSION

Before the paper the PRESIDENT (Field-Marshal Sir PHILIP CHETWODE) said: The paper on "Journeys in the Northern Andes" was to have been read by Mr. Hanbury-Tracy. Unfortunately, like so many others just now, he is suffering from influenza. His wife however is going to read her husband's paper. I am sure we are all most grateful to Mrs. Hanbury-Tracy for so doing.

Mrs. Hanbury-Tracy then read the paper printed above.

The PRESIDENT: It only remains for me to thank Mrs. Hanbury-Tracy on your behalf very much indeed for the wonderfully interesting evening she has given us, and for stepping into the breach when her husband is so ill.

Dr. Hugh Scott sends the following contribution:

There is a remarkable convergence in the evolution of some of the high-mountain plants of these northern Andes, and of the high-mountain flora of tropical Africa. In two continents thousands of miles apart the conditions at great heights above sea-level have produced an extraordinary resemblance in the habit of growth. Some of the excellent photographs shown in the lecture might almost have represented the arborescent senecios and giant lobelias of Ruwenzori, Kilimanjaro, and other African mountains. In both cases there are rosettes or clusters of long, stiff, sword-like leaves. The resemblance is specially noteworthy in the case of the Andean *Espeletia* and the African tree-senecios. Both are members of the same natural order (Compositae), but whereas the tree-senecios have gradually developed gigantic stature in comparison with their relatives, the groundsels and ragworts, in *Espeletia* it is thought that evolution has proceeded in a contrary direction, and that they have become dwarfed in comparison with a larger ancestral form. I am indebted for this last piece of information to my colleague, Mr. A. H. G. Alston, the botanist, who was present at the lecture and was also collecting plants in Venezuela for the Natural History Museum at the same time that Mr. and Mrs. Hanbury-Tracy were there. The two expeditions were, indeed, together for some days.

Another matter which struck me, as an entomologist, was the prospect of a rich yield awaiting a collector in the probably highly peculiar insects which may be associated with these strange plants, in particular any which live in the narrow angular spaces (the leaf-axils) between the bases of the leaves. The study of them might well add a chapter to the natural history of the large association of insects and other animals living in this kind of habitat, which comprises the leaf-bases of palms and pandanus in the Old World, and of the epiphytic Bromeliaceae in the New World tropics.