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Miscellaneous Publications No. 3

A Collecting Trip to Colombia, South America

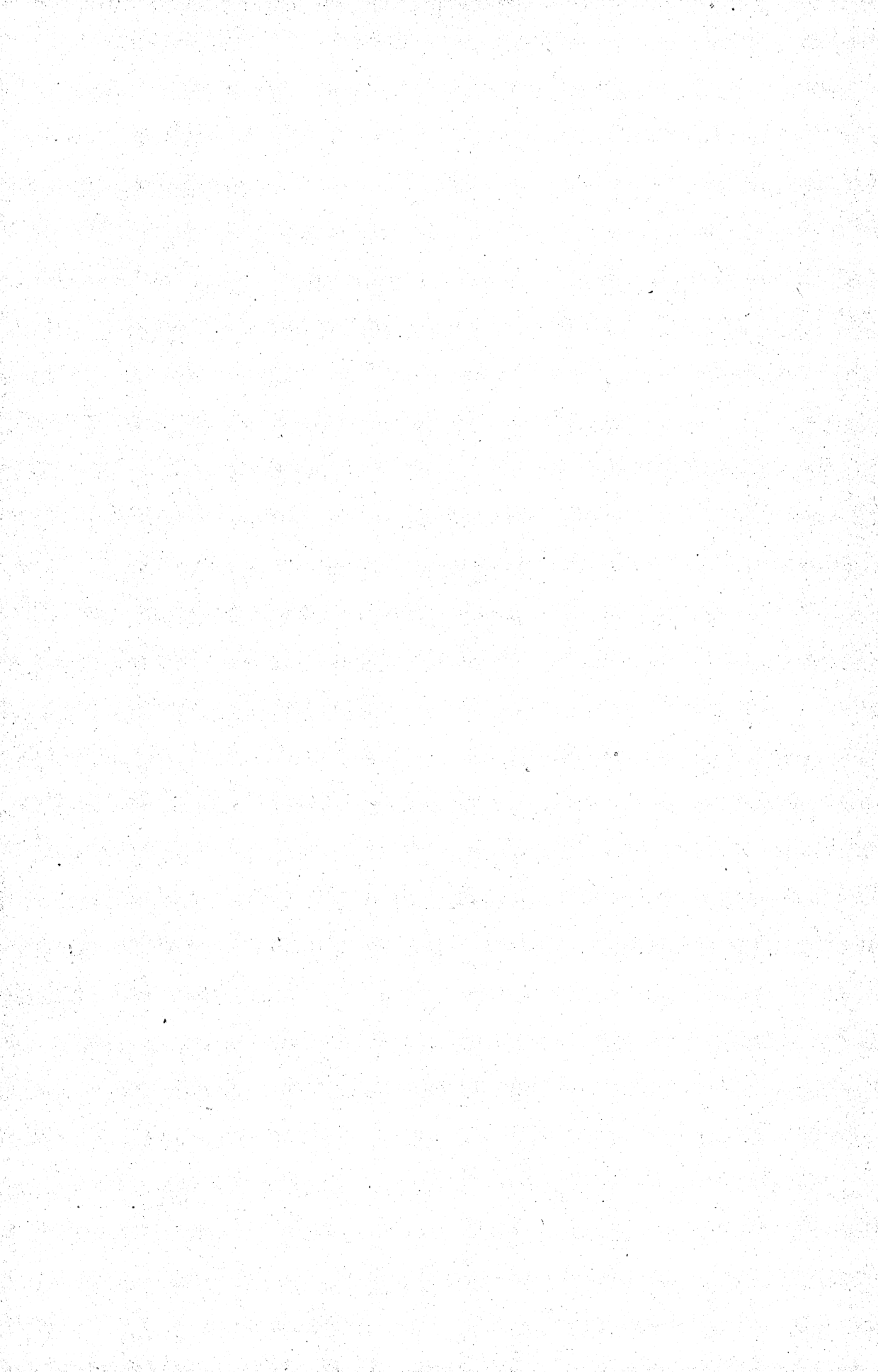
BY

E. B. WILLIAMSON

ANN ARBOR, MICHIGAN

PUBLISHED BY THE UNIVERSITY

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ADVERTISEMENT

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ALEXANDER G. RUTHVEN,
Director of the Museum of Zoology,
University of Michigan

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A COLLECTING TRIP TO COLOMBIA, SOUTH AMERICA

BY E. B. WILLIAMSON

INTRODUCTION

This trip to Colombia was made in the winter of 1916-1917 for the purpose of collecting dragonflies. The expenses were met by the Museum of Zoology and by the members of the collecting party, Jesse H. and E. B. Williamson, and the expedition will be known as the University of Michigan-Williamson Expedition. Dragonfly collecting had been done in Central America and in British Guiana by E. B. Williamson, and Colombia was selected for the present trip as offering a readily accessible, intermediate and relatively desirable region. Enthusiastic accounts of Dr. Eigenmann and Dr. Ruthven increased the writer's interest in the possibilities of Colombia as a collecting ground for dragonflies.

The time of year chosen for our trip was largely determined by information furnished us by Mr. M. A. Carriker, Jr., the well known bird student and collector, whose long residence in Colombia enabled him to give us accurately the data which we needed. This referred primarily to Santa Marta, which we had selected as our landing place, and to the adjacent country. At Santa Marta there are only two seasons, a dry season from December to March, inclusive, and a rainy season from April to November, inclusive. The first four months of the rainy season, April to July, inclusive, are bright and showery. September, October and November are cloudy and misty. The maximum drought is in February and March. The highest water stage in rivers is reached in September to November, and the lowest in March and April. Most birds nest in May, June and July, and most plants flower in April, May and December. These conditions prevail more or less up the Magdalena River to Honda, but in the interior there are two rainy and two dry seasons, the two dry seasons being December to February, inclusive, and June to August, inclusive. Other months are more or less rainy. In some localities rains may occur at any time throughout the year but especially in October. These Colombian seasons do not correspond with the seasons at Georgetown, British Guiana, where Mr. Rodway gave the writer the following data: short rainy season, November 15-February 15; short dry season, February 15-May 15; long rainy season, May 15-August 15; long dry season, August 15-November 15. From other sources it was learned that in British Guiana most birds nest in May and June; showers may begin in April; highwater stage is reached June 30-July 15; October and November are low water stages; September is one of the most pleasant months, and the short rainy season of November 15-February 15 is the most disagreeable time of the year, being misty or drizzly.

With Mr. Carriker's data before us, we should have selected February or March to May or June as the most favorable four months for our work, but as other engagements prevented this we selected December-March as the best months at our disposal.

In selecting a time or season for zoological collecting in the tropics one must of course take into consideration other factors than those of rain-fall. The most essential of these factors are the group or groups of animals especially sought, and the elevation at which collecting is contemplated. In my case, experience in tropical collecting covers only the first six months of the year and regions north of the equator. Without presuming to generalize from such limited experience, I believe that insect collecting generally will prove profitable throughout the dry season in well watered lowlands up to an elevation of five hundred and possibly in some cases one thousand meters; that high elevations tend during the dry season to become progressively less productive as the elevation increases and as the season becomes drier; that the most quiescent state of tropical animal life is attained as the end of the dry season (April to June) is reached, and that at this time many rarer lowland species which are to be found at no other season appear or attain their maturity; and that the appearance of similar rarer species in the higher altitudes awaits the showery rains (April to June) which rejuvenate the fauna of both the high mountain valleys and the lowland swamps with the sudden appearance of many species, often in great numbers.

ITINERARY

Jesse H. Williamson left Seattle, Washington, in October. I left my home at Bluffton, Indiana, in November, and we met at Panama December 5. On December 6 and 7 Charles T. Tribolet and I collected at two small streams in the Canal Zone. Several stream species were teneral; of *Perilestes* and *Psaironeura remissa* only tenerals were seen; *Coryphaeschna adnexa* was pairing and ovipositing at a small back-water pool along the railroad track. On December 7 it began raining before noon and rained hard the balance of the day. December 8 was also rainy and no collecting was attempted. The two days, December 6 and 7, mark the beginning and end of Mr. Tribolet's career as a dragonfly hunter. While in the Canal Zone, we were hospitably entertained at the home of Mr. and Mrs. Raymond Shady, former residents of Wells County, Indiana.

Enroute from Colon to Santa Marta, we collected about Puerto Colombia, Colombia, on December 10 and 11. The country was very dry and sandy, and back for three or four miles we found no running streams, only small pools in creek beds. The so-called Arroyo Grande is a muddy, brackish backwater at this season. Some of the coastal dragonflies which congregate in great soaring flocks were abundant here. These flocks, usually rather loosely organized, may consist of as many as six species, and hundreds or thousands of individuals may be in view at one time.

We landed at Santa Marta December 12. The surrounding hills are dry and support a scanty vegetation at this season, cacti producing most of

the green color. The hospitality of the United Fruit Company was extended to us through the kindness of the local manager, Mr. Sinners, and we made the bachelor apartments our headquarters while at Santa Marta. December 13 to 19 were spent collecting in the vicinity, one day being spent with Mr. James Ryan on a gasoline motor locating favorable points along the railroad between Santa Marta and Aracataca. The railroad is in operation from Santa Marta to Fundacion, a few miles beyond Aracataca. There is a distinct change from the semi-arid conditions about Santa Marta to a more humid condition about Aracataca and Fundacion. Near the residential property of the United Fruit Company in Santa Marta is the Manzanares River, which about a mile above here has a left affluent, the Tamacal. These streams can also be reached by following the railroad track. Along the railroad track, before reaching the Manzanares, there were some good pools, and just beyond the bridge over the Manzanares was a pond, on the upper side of the track, of possibly two or three acres. At the lower end of this pond were large areas of a three-parted leaved plant which, in habit, much resembled spatterdock, and near the upper end were areas of cat-tails. Following the railroad track beyond the Manzanares we came to a low forest of large trees with many small muddy streams, and, near the farther edge of this forest, to the Tamacal River.

The gullies leading back from the Manzanares and Tamacal were dry. Near the coast were extensive shallow salt marshes, known as salinas, where *Ischnuras* abounded and where the coastal libellulines flew by thousands. The days at Santa Marta were sunshiny, rarely hazy, with but one afternoon's rain. It was generally windy and at night blew so hard that we had to close the doors and windows in order to paper our dragonflies. We spent one day on the Rio Donjaca, a small, clear rocky stream ten to fifteen feet wide about twenty-five kilometers from Santa Marta. We found little of interest here, and walked back to a small sandy stream between kilometers 17 and 18. This also we found disappointing. The seven days about Santa Marta yielded 60 species of dragonflies and 1,208 specimens.

Bolivar, located about five miles out of Santa Marta, was a residence of Mr. O. L. Flye, general manager of the Cincinnati Coffee Company. Through the hospitality of Mr. Flye and his secretary, Mr. Robert Sargent, we were entertained there from December 20 to 26. The road from Santa Marta to Bolivar had been extended beyond Bolivar five miles to La Tigrera, following the Tamacal most of the way. Along the Tamacal and its few tributaries were medium growth forests; the hills were covered with grasses except where thickets or rank herbaceous growths predominated. *Ipomoeas* or related plants were not so conspicuous as they were about Santa Marta and along the railroad, where they frequently formed beautiful curtains of bloom. About Bolivar the country was largely pasture land of guinea grass with extensive areas of native xerophytic plants. The altitude of Bolivar is probably about fifteen metres, that of La Tigrera about ninety-one metres.

The Tamacal and its few permanent tributaries between Bolivar and La Tigrera were clear, rapid and rocky, and for the most part in shade.

West and north of the house at Bolivar on the east side of the road from Mamatoca to Lavilla and south of Mamatoca was a large and varied swamp. It was in both sun and shade and contained rank growths of bushes, sedges, cat-tails, ferns often ten feet high, duck-weed, the spatter-dock-like plant seen at ponds near Santa Marta, and a common thick-leaved, floating rosette plant in which *Coryphaeschna virens* usually oviposited. Here dragonflies were very numerous. Smaller pools occurred elsewhere in bush, mostly a small spiny palm, but they were less varied and few dragonflies were found about them. Along the Bolivar-La Tigrera road and in sheltered sunny nooks *Macrothemis* flew in great numbers, and at sunset *Gynacanthas* in limited numbers came out of the brush to patrol the edges of the road. Where this road crosses the Tamacal on a plank bridge one can leave the wagon road and follow the old mule trail from that point to the house at Bolivar. We found this trail shadier and more interesting than the main road, and usually followed it in our tramps up and down the Tamacal. About four miles from Bolivar, on the road to La Tigrera, an obscure foot path crossed the Tamacal and passed back through the brush and over the hills to a small banana planting. A beautiful little stream, a tributary of the Tamacal, flowed past this planting. On low vegetation in sunny spots in this field we took about twenty-five specimens of a small *Progomphus* found nowhere else on the trip. Our work about Bolivar brought our collection up to 70 species and 2,257 specimens.

On December 27, we went by mule from Bolivar to Cincinnati, where, through the kindness of Mr. Flye, we were received as guests in his home. Cincinnati is situated at an elevation of 1,371 metres. The distance by mule trail from the end of the wagon road at La Tigrera to Cincinnati was ten miles. Above La Tigrera the mountains were for the most part wooded with only occasional clearings. Near the many permanent streams tree and climbing ferns were numerous and conspicuous, and on many of the banks were great expanses of flowering begonias. Coffee was being picked at the time of our visit, and the many flowering Compositae gave one the impression of autumn at home. We collected for five days about Cincinnati, assisted at times by William Flye and W. L. Laux. Collections were made along various streams from an elevation of 762 metres to 1,371 metres, the lower elevations proving more productive. About Cincinnati we found for the first time the peculiar dragonfly *Allopodagrion*, one of the coenagrionines, which nevertheless rests on leaves, stones, logs or sand with wings as flatly spread as any gomphine. Here also we took at the smallest streams a beautiful and erratic *Aeshna*, seen nowhere else. While there was no rain during our stay at Cincinnati, great masses of clouds frequently obscured the sun, often for long intervals, and at such times odonate life simply disappeared and did not immediately reappear with the sunshine. Moreover the deep canyons in which the streams flowed served to keep them shaded except where some were exposed to the sun a few hours during the middle of the day. Under such conditions all dragonflies became exceedingly wary and sensitive to the slightest movements, and, by rising among the trees to lofty perches far out of reach, sought to escape in the very direction in which

pursuit was impossible. Even the usually rather stolid Argias showed this wariness. One day at Agua Dulce, at an elevation of about 762 metres, we took seven species of this genus. No Gynacanthas were seen about Cincinnati though they were sought in several likely places.

Below the coffee mill we found a peculiar small catfish which climbed waterfalls by clinging to the vertical rocks by means of spines on the under side of the head, and by making occasional flips upward of an inch or less at a time. At rest it looked like a whisp of algae or a bit of rag attached to the rock face and washing about in the falling water.

We left Cincinnati January 2 with our collection totalling 80 species and 2,916 specimens. That evening we looked without success for Gynacanthas near the pools and in the woods up the railroad above Santa Marta. The Manzanares was carrying more water than when we saw it in December. January 3 was spent along the Tamacal, now scarcely occupying its flat bed of fine sand, the stream being only six to ten feet wide. Our total collection to date was 81 species and 3,196 specimens.

On January 4 we went to Rio Frio. We selected this place because of the fine stream, forty to sixty feet wide,—the Rio Frio,—the close proximity of the hills, and the accommodations kindly offered us by the United Fruit Company through the Rio Frio manager, Mr. Pepin. About this place there were extensive banana fields. Where not irrigated the soil was dry and sandy and the vegetation stunted. A stream six to ten feet wide with a good flow of water in the hills was found to disappear when it came out on the flat sandy country. Many other streams were diverted for irrigation, and the flow of the Rio Frio was largely used for the same purpose. There were a number of small marshes in the neighborhood. Weather conditions were good during our stay at Rio Frio. It was usually cloudy in the early morning and again about four p. m. In the afternoon we frequently encountered flocks of Macrothemis which numbered thousands of individuals. They were mostly of one species, the females greatly predominating, the males very rare, and mature adults of either sex being still rarer or wanting. The only interest of the individuals of these flocks was the catching and eating of small insects, and their life at this time was a rather definite transitional stage between the larva and the sexually mature insect.

When we left Rio Frio on the morning of January 9 our collection totalled 94 species and 4,135 specimens. Enroute to Fundacion we collected an hour or two about some small marshes and along irrigating ditches at Aracataca. Up to this time the only *Neoneura* taken had been *Neoneura esthera*, but at Fundacion we found *Neoneura bilinearis* associated with *Neoneura esthera*, numbers of both species ovipositing in dead grassy debris caught in fences and similar obstructions in irrigating ditches. *Neoneura bilinearis* was so much paler than Brazilian and Guanan specimens, with the areas of green and yellow so much larger, that it was mistaken for a new species. Later along the Rio Cesar, the same species was seen ovipositing at the water's edge in the solid mud banks. Both species, *Neoneura esthera* and *Neoneura bilinearis*, were found together as far inland as Cristalina, near Puerto Berrio.

At three-thirty p. m. we arrived at Fundacion, the end of the railroad. Smaller areas were under cultivation here than at most towns along the railroad. Along the grade of the railroad Y at the west edge of the town were a few dirty shallow pools about which numbers of *Gynacanthas* flew in the evenings. West of this Y and visible from it was a large marsh situated in a great pasture field. This marsh was shallow and the open area did not exceed an acre. The principal vegetation was grass. Other plants which attracted attention were a conspicuous *Juncus*; a water-lily with crinkled margined leaves and white elevated flowers; a low growing, beautiful purple flower; and clumps of a large plant resembling a *Heliconia*, but with branched flower stalk and small purplish flowers. Over the low hills west of this marsh was a similar but smaller one. Here were growing another species of water-lily with entire leaves, and two large clumps of a giant *Cyperus*. Still farther west we encountered a series of long pools or lagoons, running in a northerly direction. One may reach these lagoons also by going west of town along the grade made for the extension of the railroad, this grade having been extended beyond the point where the lagoons are crossed. These lagoons represent an old river bed, probably that of the Rio Fundacion. Near where the railroad grade crosses them they were deep and treacherous and filled with floating grass and debris. Several times in collecting about them I found myself floundering in the water over my head. The adjacent country was semi-arid and brushy and was generally over-pastured by half-starved cattle. Trees on the immediate banks of the lagoons were literally filled with iguanas, which hunted about on the ground, and, when disturbed, ran for the trees, reminding us, strange as it may seem, of fox squirrels at home. The lagoons themselves were teeming with crocodiles, whose grunting sounded much like that of dogs.

From the southwest part of Fundacion a well worn trail led off through the woods in a southerly direction. A mile or less from town smaller trails led off from the main trail. These, as far as explored, led to small farms of sugar cane, yuca and bananas, or pastures cleared in the forest. The main trail one and a half or two miles out from town crossed a large, nearly dry creek or arroyo in which remained pools of varying lengths, eight to ten feet wide. This very muddy creek bed, followed down stream for about half a mile, brought us to the Rio Fundacion. Just before the main trail crossed the arroyo, a trail led off to the left. This itself immediately crossed the arroyo, and, after passing through a small growth wood and a pasture, came out on the bank of the Rio Fundacion above the mouth of the arroyo and then followed up the river. Where the path followed the river closely, we took a number of specimens of a most peculiar small gomphine. This gomphine was most common in a growth of *Heliconias* and mixed palm and bamboo forest, where the path passed between the river and a large lagoon into which the river flows during high waters. This lagoon was not discovered until our second visit. Doubtless many such lagoons are scattered through the forest, unknown and inaccessible because of the spiny and thorny jungle. The path ended in a small farm where a number of products were cultivated, and in the fields, resting on grass and low plants,

another gomphine was taken. Going back to the main trail and crossing the arroyo, we found another trail branching to the left. This trail passed through the wood and by some small clearings and plantings, including a small banana field on the left, to end at a shelter hut in a yuca and sugar cane field two or three miles from the main trail. Resting on twig tips in the wood along this trail a third gomphine was taken. This gomphine was usually found in moist locations where *Heliconias* of gigantic size grew in clumps and where the forest had a dense growth of dwarf bamboo one to two feet high. They also occurred, but in fewer numbers, wherever a fallen tree top furnished some dead twigs for perches. They were found in both sun and shade but preferred mixed or patchy sunlight.

East of town was an irrigating ditch. The trail on the south side of the cemetery led to it through brushy pastures. Just above the juncture of the ditch and the trail were some low woods densely carpeted with selaginellas and similar low plants. In this low vegetation and in adjacent brush, consisting of spiny palms, hooked bamboos, *Heliconias* and other mostly spiny plants, we found large numbers of *Metaleptobasis*. Most of these we caught by hand as we wriggled through the brush. Any other mode of progress was impossible, and an insect net was useless under such conditions.

The days at Fundacion were generally bright. One afternoon was cloudy; and it rained most of one night and till about ten a. m. the next day, remaining cloudy till noon. The great flocks of *Macrothemis* with which we had grown familiar about Santa Marta, Bolivar and Rio Frio, were absent here.

We left Fundacion the morning of January 15, the collection to date numbering 107 species and 4,945 specimens. We took a night ferry from Cienaga to Barranquilla which we reached about six-thirty a. m. January 16. We left Barranquilla on the river steamer *Manizales* after sundown January 18. The boat spent the early part of the night ramming first one bank and then the other, and tearing souvenirs from sundry boats and barges tied up in the canal leading from the city to the Magdalena River. We arrived at Calamar about sundown January 19. The night of January 20 we tied up at Yati where a lot of cattle were to be loaded on board next day. We took advantage of this delay and spent the forenoon of January 21 collecting up river to Magangué where our boat arrived about two p. m. The country about Yati and Magangué was fairly typical of a hundred miles or more of the country adjacent to the lower Magdalena. Great pastures succeeded one another, with frequent lagoons a short distance back from the river and paralleling it. Heavy forests were rare. The hills are far back from the river, frequently none being seen in a day's travel. Walking from Yati to Magangué the road followed closely along the river with extensive lagoons on the other hand, and passed over two small tributaries. We saw *Brachymesia* and *Miathyria* literally by thousands.

El Banco, 86 leagues up the river from Barranquilla, had been chosen as our first stop. We arrived there about five p. m., January 22, and made ourselves at home at the Central Hotel. Cattle raising was the principal

business at El Banco. For several hours before reaching the town we were passing, on the left bank of the river, the finest and most extensive pasture seen. El Banco is well situated on high ground at the juncture of the Rio Cesar with the Magdalena. Above El Banco was extensive fishing in the Cesar which was deep and swift with bare washed mud banks. The fish, taken in nets, were dried on racks or on the ground. We followed a wide road, the Camina Chimichague Y Chiriguana, leading out from El Banco, which at first passed through some slightly rolling country. The stream beds here were all dry, with the banks and immediately adjacent country wooded with bamboo and palms. About three miles from town two trails left this road. The trail to the right apparently followed the Rio Cesar; the other, to the left, was probably the Mompos road. These trails immediately crossed a perfectly flat, scantily grassed sun-baked plain over which termite nests were scattered with sufficient regularity and with just sufficient variation in size to give the impression of an old and very large cemetery. That we were suffering from thirst and our heads fairly rocking with the heat when this funeral plain came into view, detracted nothing from the vividness of the impression. Both trails led to a scarcely perceptible depression, marked by adjoining forest which traversed the plain like a broad ribbon. The shallow creek bed in this forest was almost dry, but about the long stagnant pools *Psaironeura remissa* flew by hundreds. One of these pools was possibly one hundred yards long. All were shaded. Large numbers of small brown monkeys took considerable interest in our work and showed some offense at our presence.

About half a mile out from town, on the right hand side of the main road, are several marshes. We attempted to work these and then cut across in an easterly direction to the Rio Cesar, but were unable to do this because of low impenetrable jungle. The marshes themselves yielded but poor results.

For about two miles which we explored above El Banco the right bank of the Rio Cesar was largely pasture, the original forest having been almost entirely destroyed. At this point a large affluent from the right comes into the Rio Cesar. Like the Magdalena, the Cesar had lagoons, only on a smaller scale, and in some of these, which were stagnant and muddy and heavily shaded with brush, we took numbers of shade-frequenting coenagrionines. Sometimes we secured these where the dense gloom made it almost impossible for us to distinguish the insects. It is rather remarkable that the great forested areas of the north, at least of the Nearctic region, have no such shade-frequenting dragonflies as occur about both ponds and streams in the tropics. Possibly our more northern species are more ancient than the environment in which they now find themselves.

We left El Banco the afternoon of January 26, bound up river for Barranca Bermeja, 139 $\frac{1}{4}$ leagues above Barranquilla. Our collection now totalled 113 species and 5,407 specimens.

The days that followed differed but little from the days spent between Barranquilla and El Banco. At night the boat was tied up to the bank. During the day there were the same frequent stops to take on wood. The

food was good, sleeping on deck at night was pleasant, our traveling companions were friendly and agreeable, and the frequent delays cost us nothing as our tickets included meals. Consequently when a sand bar held us for a few hours or a smashed wheel delayed our progress for a day, the calmest philosophy could prevail, at least among the passengers. It would be possible for a collector interested in insects attracted by light to rig his outfit on the upper deck of one of the slower river steamers and to obtain thus on a round trip from Barranquilla to La Dorado, a distance of 198 leagues, a fair representation of the night-flying insects of the whole lower Magdalena. The time required would be about three weeks, and the round trip transportation, including meals, was, when we were there, \$30 on one line of steamers and \$60 on another; the service was about the same on both.

We approached Gamarra January 27. The country is flat with mountains in the distance. At Gamarra the hills seemed relatively near at hand, but we learned that Aguachica, about twelve miles from Gamarra on the road to Ocana, is in the river plain, and that Pie de la Cuesta, about twenty-four miles from Gamarra, on the same road, is in the hills. Though a small town, Pie de la Cuesta had ample accommodations for travellers. Ocana is about forty-two miles from Gamarra, a journey of a day and a half by saddle horse, costing, with a pack mule, \$6 for the trip. It was our intention to go to Ocana on our return down the river but lack of time prevented this.

The topography above Gamarra is the same as that below the town. The country is flat with mountains in the distance. There were numerous sand bars in the river where we observed many crocodiles. As on preceding days small collections were made at several points where the boat tied up to take on wood.

During the afternoon of January 29 we reached Barranca Bermeja and put our baggage ashore. As no hills were in sight, and the country was very dry and unpromising with no small streams, we re-embarked and paid our fare to La Dorado, the end of lower river navigation.

Above El Banco the forests were larger, the bluffs more frequent, and the cienagas (lagoons) rarer. Below Puerto Berrio the Magdalena cuts through a bluff or ridge fifty to seventy-five feet high. January 30 about seven p. m. we arrived at Puerto Berrio, 163 $\frac{3}{4}$ leagues above Barranquilla. On both sides of the town are frequent low hills. Through the kindness of Mr. Lope M. Montoya G., of Medellin, to whom we are indebted for other data, we learned that the elevation of Puerto Berrio is about 130 meters.

Our boat was scheduled to leave Puerto Berrio January 31 at four p. m., so we decided to spend the day collecting and set out at seven-thirty a. m. About three and one-third kilometers from town a small sluggish stream, flowing north, crossed the railroad track. Near the track this stream was in a grass marsh condition, but it soon passed below into a dense over-flow forest of tall trees, spiny palms and lower shrubs and vines, through which we could pick our way with slight difficulty. At this season the wood was moist but there was no standing water. The creek was from four to

ten feet in width and had a maximum depth of three feet and a generally firm mud bottom. Dragonflies were numerous in the varied habitats formed by forest, stream, sun and shade, and such diverse things as *Perithemis* and *Metaleptobasis* were found in numbers. This forest was rapidly being destroyed to furnish fuel for the railroad.

We were returning from our collecting about three p. m. and were near the Magdalena about a kilometer above town, when we heard a river boat chugging its way up stream. A hurried dash to the river's bank showed us our boat in midstream, carrying away, as we knew, all our baggage and supplies, while we stood in our wet clothes in a bamboo thicket on the river's bank and marked her passing. We yelled and waved our nets but attracted no attention. Fortunately J. W. thought of his revolver, and three shots attracted the attention of the captain, who most obligingly ran into shore and picked us up. From the other passengers, apparently as excited and delighted as ourselves, we learned that the boat had discharged its cargo, and, after whistling for us in vain for about an hour, had left Puerto Berrio between two and three p. m. This incident is related for two purposes,—to show the obliging friendliness of the captain in picking us up, and to record an instance in Latin-American affairs, when, for the only time known, events moved ahead of their schedule. The statement may be received incredulously by other travelers.

Twelve to sixteen leagues below La Dorado the forest was not quite so large as that below Puerto Berrio. The dirt banks were generally sloping, instead of vertical and caving as they usually were up to El Banco and some distance above it; and frequently the shores were rocky or gravelly instead of sandy as below. Both above and below Puerto Berrio were a few rock exposures. We arrived at La Dorado, 198 leagues above Barranquilla, on February 1. Contrary to what one might have expected from its commercial importance, La Dorado was a poor and insignificant town.

The character of the country along the railroad between La Dorado and Honda has changed greatly since Professor Bingham described it as a dense tropical jungle. We found it to be almost continuous pasture. There were two or three nice streams and some marshes within five miles of La Dorado, but from that point on to Honda the country was almost worthless to a dragonfly collector. We arrived at Honda about three p. m., February 2. Enroute we had made up our minds not to stop there, as we had originally planned to do. Observations and inquiries, which we made while the train lay over at Honda for nearly two hours, strengthened our decision and we entrained for Maraquita. There were small streams near kilometer post 37, between posts 38 and 39, and between posts 43 and 44. From about kilometer post 44 to Maraquita the country was a continuous flat pasture with high rocky hills in the background. At Maraquita we found a small satisfactory hotel, and Mr. A. G. Lè Clercq, general manager of the railroad, to whom we carried a letter of introduction, gave us valuable assistance and advice in reaching desirable collecting grounds. The elevation at Maraquita is about 457 metres.

The San Juan River near Maraquita furnished the station and town

with its water supply. Near where the trail leading from town to the intake joined the river there was a large waterfall. Above this fall the San Juan was a fine rocky stream five to ten feet wide with rapid drop and with some high waterfalls. The sides of the valley through which it flows were high and rough and wooded with tall trees and bamboos, four to five inches in diameter, beneath which grew many Heliconias and some aquatic plants. Below the waterfall to its mouth in the Cuamo, it was a beautiful rapid stream six to fifteen feet wide, with some cliffs and generally high banks, but with no falls. The Cuamo carried about three or four times as much water as the San Juan, and, where we explored it for a short distance above the mouth of the San Juan, it was similar in character to the lower San Juan. It was one of the most beautiful rivers I have ever seen.

About three kilometers south of town the railroad crossed a very small stream which, when we were there, had almost ceased to flow. This we followed to its mouth in the Poquera. The Poquera was about five to fifteen feet wide and had a wide, relatively shallow, rocky and sandy bed. It is said to become nearly dry in the dry season.

As might be expected, species of *Argia* and *Hetaerina* were the conspicuous dragonflies where we collected about Maraquita. Along the upper San Juan we saw for the first time specimens of a new Thorine genus, *Miocora*, since described by Dr. Calvert from a Costa Rican male. Near the same place we took a female of an undescribed *Erpetogomphus*, a genus hitherto not known south of Costa Rica. On the same stretch of river we saw *Heteragrion*s for the first time since leaving the Canal Zone, and *Allopodagrion*, previously taken at *Cincinnati* near Santa Marta, was common. Along the Poquera and its small tributary we found a small protoneurine, a much more inconspicuous insect than the notoriously inconspicuous *Psaironeura remissa*. Along the bank of the lower San Juan, near the water's edge, where a yellowish seepage formed a little swampy spot about one foot wide and six feet long, we took several specimens of a small *Argia* which was seen nowhere else. Damp places about the taps of the water pipes in the town were frequented during the day by the tropically omnipresent *Orthemis ferruginea* and after sundown by a few *Gynacanthas*. The weather at Maraquita was not the most favorable for collecting as generally it was very cloudy until about ten a. m., and during the rest of the day the sun usually shone through a haze. A light rain fell during the night of February 5.

On February 6 we took train from Maraquita and returned to La Dorado. Our collection now numbered 126 species and 6,097 specimens.

Among the five river steamers tied up at La Dorado we found the General Cordoba, on which we had travelled from El Banco to La Dorado, and we at once engaged passage to Puerto Berrio. We left La Dorado about five a. m., February 7, and reached Puerto Berrio about ten a. m., February 8, having been delayed by a smashed wheel and stranded on a sand bar. The remaining hours of the day were spent along the same stream where we collected January 31. At some small grassy marshes along the railroad grade, enroute to this stream, we saw *Coryphaeschna virens*, a

Tramea, and several other typical tropical swamp species of wide distribution.

At six a. m., February 9, we took the train from Puerto Berrio to Cisneros. For about twenty miles the track ran through forest and fields and then began to climb into higher hills. Cisneros, the end of the railroad, at an elevation of 1,060 metres, was surrounded by country almost stripped of its forests, the remnants consisting of scattered clumps on the high hill tops. The Nus was yellow and dirty, due to the activities of gold diggers. The hotel at Cisneros was good but the devastation of the adjoining country made it an unfavorable collecting point. Sofia, near kilometer post 101, had a hotel, and was probably a much better collecting point than Cisneros.

The valley of the Rio Santa Getrudis opposite Cisneros, across the Nus, seemed to have more trees than usual in this region and we collected there February 10. The Rio Santa Getrudis was a clear stream ten to thirty feet wide, rapid throughout, and with many large waterfalls and rock masses. Had time permitted, we probably should have found the many small tributaries more productive than the main stream, but a little time spent on these was not encouraging. Along the main stream were only small clumps of forest, but the tree ferns, some thirty feet high, gave some hint of the glory that had been. From its mouth in the Nus we followed the stream up through the hills for several miles. Throughout this distance it was largely exposed to the sun, and the abandoned hill sides were covered with rank impenetrable grass and dewberry briars. Apparently the agricultural method in use consisted in clearing the forest, planting to crops, usually corn or sugar cane, until the soil was exhausted, abandoning it, and making another encroachment on the forest. The result was that the farmers lived far away from town, up the valleys of the numerous streams. The paths from the farms to town were conspicuous as yellow streaks on the devastated hills. The days collecting netted us only four dragonflies out of six seen, an almost unbelievably poor day. We needed no further evidence, and the next day, February 11, we took train back towards Puerto Berrio, leaving it at Cristalina, about twenty-eight kilometers above Puerto Berrio. Several good points were accessible along the railroad between Puerto Berrio and Cisneros. There was a good hotel at Puerto Berrio, and the train, leaving there early in the morning and returning in the evening, would have made it possible to collect over a wide variety of country with Puerto Berrio as headquarters. Cristalina was a little native village with no posada (inn), but we were able to rent a room in a hut from one family and to obtain board with another family, that of Lino Zapata, an intelligent native who acted as our mozo during our stay at Cristalina.

The elevation of Cristalina is about 320 metres. It lay in a densely wooded country abounding in beautiful small streams. Conditions were humid, vegetation was rank and small tree ferns were noted. A small stream, the Quebrada Cristalina, flowed directly through Cristalina. The water of this stream was brought from the hills to the village and railroad through an iron pipe. During our first day at Cristalina, February 12, we followed this pipe back to the intake. Between the intake and the town the

stream flowed largely through pasture and brush land, but above the intake it flowed in forest. Here it was only one to three feet wide and was frequently lost in the stony gravelly bed. It had its origin in the hills about a mile above the intake. The richness and peculiarity of its dragonfly fauna may be realized from the fact that our first day's collecting yielded a *Miocora*, two species of *Palaemnema*, a *Perilestes*, three protoneurines, three *Heteragrions*, a *Philogenia*, an *Allopodagrion*, an *Acanthagrion*, a *Megaloprepus*, two *Mecistogasters*, and numbers of *Argias*, *Hetaerinas*, and libellulines. At a later date, collecting along the quebrada in the brush between the town and the forest we found two species of gomphines. Below town the railroad followed the Quebrada Cristalina more or less closely. About midway between kilometer posts 26 and 27 was a path to the left, past a single native hut in a field. This path brought us to the Rio Diez-y-ses, where it was bridged by a large log. Just above this foot bridge was the mouth of Quebrada Cristalina.

The Rio Diez-y-ses above the foot bridge was largely in forest. It was a fine stream fifteen to thirty feet wide, of varied character, with mud, sand, rocks, long pools and some rapids. Beyond the foot bridge over the Diez-y-ses was an abandoned railroad spur, running back at right angles to the stream. Following this spur to its end and taking the trail which skirted the forest, with brushy pasture on the right hand, we came to the Quebrada Sabaleticus, about three-fourths of a mile from the Diez-y-ses. This quebrada, in the forest, was a wonderfully fine stream six to twelve feet wide with frequent long pools and rapids. The firm footing, the beautiful and varied scenery, and the rich fauna made collecting here almost ideal. Here for the first time we saw *Cora* and observed its peculiar habit of ovipositing, which it shares with *Miocora*. The eggs are inserted in comparatively solid but barkless horizontal tree trunks or pieces of logs over water. In some cases the logs were scarcely damp, and the eggs were placed as high as six feet above the water. At least three species of gomphines lived along Sabaleticus, and no less than four *Heteragrions*.

Following the Sabaleticus up stream one and a half or two miles from where it emerges from the forest into the brushy pasture we came to a waterfall between four and five feet high—the highest waterfall we discovered on this quebrada. About a quarter of a mile above this waterfall a very small tributary from the right enters the quebrada. We followed this tributary to its source in the hills. About a half mile back from its mouth, standing at an angle of 60°-90°, is a broken rock face over which water dripped. Here and here only we found *Mesagrion*, hitherto known from a single male specimen, which, while closely related to *Heteragrion*, has the peculiar habit of resting with wings closed, and not half opened as one would expect from its relationships.

Below kilometer post 25 and on the left side of the railroad track was a cattle chute, from which a trail led to a clump of farm houses in a brushy pasture on the right bank of the Rio Diez-y-ses. A short distance below the cattle chute was a gate and another more distinct trail which brought us to the same destination. If we crossed the Rio Diez-y-ses at this point

and then kept to the right, following the cattle paths through the brushy pasture, we came to the Quebrada Camelia. By keeping to the left instead of to the right, we would come to the Quebrada Sabaleticus, but this route to the latter stream was longer than the one described above. The Quebrada Camelia is another beautiful little forest stream about twice as large as the Cristalina and two-thirds or three-fourths as large as the Sabaleticus. Here we took the fifth known specimen of *Cyanogomphus*, a new species, no two specimens of the same species being known.

These three quebradas are all tributaries of the Rio Diez-y-ses. Their locations have been described at some length because of the wonderful collecting conditions found about Cristalina. In the town and along the edges of the brushy pastures *Gynacanthas* flew in numbers after sundown. The edges of the forest where tree tops and logs lay in confusion were alive with a great variety of libellulines. In sunny nooks several species of *Macrothemis* hawked in numbers. Butterflies and beetles were numerous and varied, and many birds noticed nowhere else were seen here. The locality was readily accessible, being reached by train from Puerto Berrio, where all the river steamers from Barranquilla stopped. The people were kind and helpful in every way, and altogether this was the most ideal collecting locality I have found in the tropics. Expenses were at a minimum. Our room cost us about fifty cents a day. Arrangements could be made doubtless at half this price. Our food with the Zapata family was good, though unvaried, and cost fifty cents a day. We paid Lina one dollar a day for acting as mozo.

The weather conditions at Cristalina were not the best when we were there as the following brief notations for several consecutive days will show: February 12, sunshine most of the day; 13, cloudy most all day; 14, cloudy until noon, afternoon sunny; 15, cloudy all day, a few minutes rain in the afternoon; 16, forenoon cloudy threatening rain, afternoon cloudy with short intervals of sunshine, rained during the night; 17, forenoon fairly clear, afternoon mostly cloudy; 18, rained about six a. m. but the day was generally sunny; 19, a drizzling rain for fifteen to twenty minutes about eleven a. m., weather conditions unfavorable all day.

February 20 we returned to Puerto Berrio with our collection numbering 148 species and 7,993 specimens. The next day we collected once more in the wood near Puerto Berrio. Along a wood cutter's trail in the forest near the stream J. W. saw a red or reddish aeshnine (?) almost as large as a *Staurophlebia*.

February 22 we left Puerto Berrio on the steamer Ayapel and passed Barranca Bermeja about one p. m. Here great schools of fish were swimming up stream near the bank, forming a wide silvery ribbon in the water. Crocodiles were very numerous in the river. On February 23 we saw twenty-eight lying closely together on one sandbar and forty-six on another. A herd of cattle were in the water near the second group but the crocodiles and cattle paid no attention to each other. Our boat tied up for the night at a wood pile a short distance above El Banco, where we arrived about six-thirty a. m., February 24. We arrived at Magangué about five-thirty p. m.

and spent a pleasant hour with Mr. Carlos Nieto, a commission merchant with whom we had formed an acquaintance enroute up the river. That night our boat tied up at a cattle chute below Magangue. About daybreak they began loading seventy-five cattle on board, and, this accomplished, we reached Calamar about three p. m. We remained at Calamar until about two a. m., February 26, when we started for Barranquilla. The long delay we experienced in getting out of the canal leading to Barranquilla was repeated on our return. About eight a. m. the yacht *Ideal*, running as a ferry between Barranquilla and Cienaga, passed us in the canal, and, after prolonged shoutings and wavings on our part, returned, picked us up, and landed us at Cienaga about four p. m. We caught an extra mail train from Cienaga about seven p. m. and slept that night in our old rooms at the bachelors' quarters of the United Fruit Company at Santa Marta.

While ascending and descending the Rio Magdalena the objects probably most interesting both to the other passengers and ourselves were the large number of flowering trees in the forest. Other trees were also interesting but for other reasons. Frequently along the water's edge and just back from it were dense stands of small or moderately sized trees with very light colored trunks and branches and large leaves, known as the guarumo. Overtopping the forest, and sometimes standing out alone in beautiful majesty, were the bonga trees, at times with unbranched trunks rising one hundred feet, the perfect mushroom-shaped tops adding another fifty feet to their heights. The trunks exude a latex widely used by the natives in the treatment of boils. The wood is soft and useless. A number of flowering trees, as seen from the river steamer, seemed to rise to about the same height in the forest. One rare kind was a snowy white; another commoner kind was a bright dandelion yellow; another was blue; another dark blood red; and a very common and very beautiful one was a peach pink. There was little uniformity among the names given these trees by various passengers on the boats. A small broad tree which was very common had orange yellow flowers and orange brown buds in great profusion. Another common small tree had flowers in clusters, some of them red and some white or greenish. What we at first thought were the dull reddish bronze flowers of a tree, we found, on a closer view, to be the flowers of a vine which in some cases almost concealed the tree top over which it spread. Once at Maraquita we saw an ant trail where the petals of one of the pink trees were carried in a continuous narrow ribbon of color; a short distance away another ribbon of color, in this case bright yellow, moved slowly but uninterruptedly along.

It must be understood that the flowering trees mentioned above were not dominant in the forests along the Magdalena at the season we saw them. These forests were, like all lowland tropical forests we have seen, rather sombre masses of varying shades of green only rarely relieved by other and brighter colors. That enraptured vision which beholds tropical rivers flowing through ever-changing vistas of brilliant flowers of every conceivable hue has never been vouchsafed us. Neither have we been gifted with those supernatural powers of sight and hearing which some travellers possess and

which reveal to them in their voyages some of the rarest and most secluded animal denizens of the densest jungles. In fact nothing is more difficult to reconcile than the varying accounts of travelers in the tropics. For example, one celebrated author has reported a dense tropical jungle where we found broad pastures, and on the Magdalena he never saw a single crocodile where we observed thousands and where, by actual count, forty-six were seen on one small sandbar.

February 27 we collected in the low forest along the Tamacal and along the railroad about three miles out from Santa Marta. The leaves under the trees were very numerous and dry, but the trees were bright green, and more in flower than when we previously collected here. The ground was still moist under the leaves, and a small flow of water was still in the little streams in the wood. Dragonflies were rarer than formerly and no additional species were seen. The vegetation on the adjoining hills was quite brown and dead in appearance except for an occasional bush and numerous cacti. A yellow flowered prickly pear cactus was in bloom. The abundant, large, coarse, bushy, pink flowered *Ipomoea* (or related genus) was about done flowering and was becoming leafless, its seed pods bursting and revealing the hairy or woolly seeds. The flowering trees, which were numerous, had, so far as noticed, white blossoms. Fires were burning on the hills at some places. Coming down the Magdalena River we had seen many fires in the mountains. Our collection, including the specimens taken at the Canal Zone, Cartegena, Puerto Colombia and at various stops up the Magdalena River, not hitherto counted in the total, now numbered 150 species and 8,553 specimens.

The evening of February 27 we spent with Mr. and Mrs. Flye, Mr. and Mrs. Ryan, Robert Sargent and other friends; and the morning of February 28 about five o'clock we left Santa Marta on the United Fruit Company steamer of the same name bound for Colon.

We arrived at Colon March 1, and left there March 4. On March 5 we came at five p. m. to Bocas del Toro, Panama, and about six p. m. to Almirante. Here we looked without success for *Gynacanthas*.

March 6 was spent pleasantly with the English entomologist, Mr. C. B. Williams, who was studying the local frog-hoppers. We went on the railroad to Guabita and spent a few hours collecting there. Along the railroad from Almirante to Guabita there is some good collecting country, especially about twenty-three miles out from Almirante. Almirante would provide good headquarters for one wishing to work in southern Central America, as a varied country is accessible from here, and the expenses would be much less than in the Canal Zone.

The evening of March 6 we left Almirante, and arrived at Havana about ten a. m., March 10. We took a short country drive and at favorable looking streams searched in vain for *Neoneuras*. The boat sailed about four-thirty p. m. and reached New Orleans about six p. m. March 12, where we passed customs without friction or expense.

COST OF TRIP

Our expenses were about \$650 each, but, as this included a number of unnecessary purchases, \$600 may be considered a fair estimate of the cost. The round trip fare from New York or New Orleans to Santa Marta on the United Fruit Company steamers, including meals, was \$180. Hotel rates at Santa Marta and Barranquilla were \$2 a day; at El Banco the rate was \$1.20 a day. The first class charge from Cienaga to Barranquilla was \$3.50, with stateroom \$1 extra. The round trip first class fare from Barranquilla to La Dorado without stateroom was \$30 on one line of steamers and \$60 on another line. On the first line the stateroom adds about forty per cent to the cost; on the second line about twenty per cent—that is, stateroom charges are about the same on both lines. We had staterooms from Barranquilla to El Banco, but at no time thereafter, as we really preferred sleeping on deck and the shower bath rooms sufficed for shaving and changing clothing. Sleeping on deck, however, requires retiring at a certain hour, when all the cots are brought out and distributed over the deck, and arising at a certain hour in order that the deck may be cleared for the day. Travelling on the river with frequent stopovers adds very little if any to the fare, as this is equitably figured on the basis of leagues between points. Mozos such as we employed for carrying our collecting outfits and lunches charged from sixty cents to one dollar a day. Carriages in cities for ourselves and several pieces of baggage cost us usually about \$1 a trip.

NOTES ON EQUIPMENT AND COLLECTING METHODS

Extra Equipment.—At the hotels at Barranquilla one can arrange for the purchase of a mosquito net, a light blanket and a pillow for use on the river boats. We carried these necessary articles in an old burlap sack. Mr. Carriker recommended folding cots, but we were not able to purchase these in Barranquilla and were able to obtain only one cot at Cristalina. As a consequence during our stay there, J. W. slept on a narrow bench upholstered with old shirts and miscellaneous clothing. On the river steamers cots are furnished.

Medicines.—We made it a practice to take four grains of quinine a day in four doses. J. W. had no fever and I had only one light attack which put me in bed one day at Rio Frio, and from which I recovered after increasing the quinine for a few days to about fifteen grains a day. Amoebic dysentery was common along the river, and I had an attack at Maraquita, contracted probably at El Banco. No physics were taken but paregoric in frequent doses and alcresta ipecac were used from the start. Paregoric was discontinued when it was no longer needed, and ipecac, equivalent to 400 grains, was taken sixty grains a day. Recovery was rapid and I was incapacitated for field work only two or three days. For red bugs (harvest mites) we used the liquid known as cresol compound. This is known also by a great many trade names, and is sold everywhere as a disinfectant and for a dip or wash for live stock. It makes a milky mixture with water. We used it about

one part to ten parts of water, dipping a small rag in the mixture and moistening the entire body, morning and evening, and sometimes once during the night; in each case we allowed the fluid to dry on the body. It acts as a local anesthetic, and allays the irritation caused by the bites of other insects. It is also a splendid antiseptic. Its use enables one to collect where continuous field work would otherwise be impossible.

It may be remarked that the country about Santa Marta and more especially the country about El Banco have more than their share of biting and burrowing pests. At Bolivar excessive swelling of the hands, caused by insect bites, compelled J. W. to stay indoors a day or two. He counted one hundred and sixteen fresh bites on one arm one day. At El Banco we entertained red bugs by the thousands. Aqua ammonia was also useful in allaying the irritation caused by insect bites, and a scorpion sting J. W. received at Maraquita gave him little trouble when so treated. The prickles of a large leaved spiny plant, called ortiga or pringamosa, which were very irritating, invariably produced pustules in spite of all our remedies. Among so many spiny plants scratches and cuts result almost daily and in wading among logs and rocks one's shins are frequently barked. The wounds so caused were thoroughly cleansed and rubbed with a bit of gauze or cotton soaked in a solution of one hundred and twenty grains of resorcin and twenty grains of salicylic acid in eight ounces of fifty per cent alcohol. During the entire trip no wound became infected. Constant wading softens the feet and often the toes about the nails become sore and irritated. Iodine is the best treatment for this. It was found helpful to dust in our dry socks, after the day's collecting, a mixture of talcum powder, powdered alum and sulphur. An attack of "dobie itch" was quickly cured with balsam of Peru after treating it without success with iodine and later with boracic acid.

Of course we carried the other paraphenalia usually found in first-aid outfits, but the above suggestions may prove useful to one planning his first collecting trip in the tropics. It should also be stated that salol is very valuable as an intestinal antiseptic; a missionary nurse told us she cured many cases of dysentery with it. J. W. had occasion to use it at one time and it gave almost immediate relief.

Collecting Methods.—The methods employed were essentially those which I have previously described.¹ However, a few additional suggestions may be made. In papering it is well to hold the envelope flat and leave the abdomen of the insect, especially of coenagrionines, a little above and parallel to the long fold in the envelope, and thus avoid pinching the specimen in the fold of the paper when the envelope is closed. At Cristalina our supply of smaller envelopes became exhausted, and it was necessary to paper several specimens in one envelope. This was accomplished by keeping the abdomens parallel and at right angles to the long fold in the envelope, arranging the insects so that the pressure of the envelope fell entirely on thoraces. The envelope was so placed in the drier that the abdomens hung

¹"Directions for Collecting and Preserving Specimens of Dragonflies for Museum Purposes." Misc. Publ., Mus. of Zoology, Univ. of Mich., No. 1.

straight or extended parallel to the long fold. Of course careful handling of the envelopes was necessary until the insects were dry, but when, on our return, we opened these envelopes, sometimes containing six insects, we found the specimens beautifully preserved with a minimum amount of distortion.

In papering aeshnines and gomphines, instead of using the bit of glued cord at one end of the envelope, as is our custom, we usually used some common libelluline with a thorax sufficiently bulky to insure no pressure of the envelope on the abdomen of the other specimen. This worked as well as the glued cord and reduced the number of envelopes required to paper the day's catch.

In papering libellulines, in which it is desirable that the legs should not cover nor obstruct the view of the accessory genitalia, it was found that by taking the opened envelope in the left hand and by holding the wings of the insect with tweezers in the right hand, it was possible, without loss of time in papering, to brush the legs of the insect forward, over the edge of the envelope, thus entirely clearing the genitalia. This may seem a small matter except to one who has had occasion to examine the genitalia of a few hundred or thousand libellulines.

During our trip some of our killing bottles became "weak," and in several instances inert but not dead specimens were placed in the ordinary letter envelopes in the collecting box for transportation during the day. Such specimens, when they revived, chewed and tore other specimens placed in the envelopes with them. This was guarded against by using "strong" bottles for killing and weaker bottles for carrying material till a sufficient number had accumulated to justify opening the collecting box. Specimens with broken necks, caused by twisting the head, will not damage other specimens.

While papering material at night it was found that if the letter envelopes were white or light colored one could more readily see whether or not they were emptied of all specimens, since, in poor light, any insect clinging to the inside of an envelope is more readily seen in or through a white envelope. It was found desirable to letter or number these envelopes, designating three or four groups. For example, each one-fourth of the envelopes would be plainly labelled A, B, C, and D, respectively. In the field it is advisable that the specimens gathered in the same habitats or localities be placed in the envelopes similarly lettered. Such a procedure will facilitate papering the material in properly designated envelopes when the day's collecting is over. Other conditions also arise where separation of material during the day is desirable. Of course variously colored envelopes are even better than lettered or numbered envelopes, except for the reason given above for preferring white envelopes.

COMMON NAMES OF DRAGONFLIES

Mr. H. L. Tyrer, of Barranquilla, told us that so far as he knew *caballito* was the only name in common use in Colombia. At any rate in our limited experience we always found this name readily understood. Young men travelling with us on one of the river steamers told us that at Medellin

dragonflies were commonly called *senoritas*, and at Bogota they were called *matapiojo*. The first part of the latter name means a killer, and the last part an insect the same as or similar to the red bug,—in other words, the red bug killer. A well educated gentleman at Puerto Berrio said that in the Department of Antioquia dragonflies were called by the common people *chilcaqua*, from *chiquear*, to reduce, to make less and less, hence to flip or dip out, and from *aqua*, water, the name doubtless tracing back to some early observer of an ovipositing libelluline, very probably *Orthemis ferruginea*. One evening at El Banco when we had an audience of several persons while putting up our day's catch, we asked if the insects were called *caballitos*. To this we received an affirmative reply from everyone but a small boy who pointed to a zygopterous specimen and said "*ceritongo*" (*cieratonga*). The day's catch included libellulines, large and small, aeshnines, gomphines, and a mixture of zygopteras including *Mecistogasters*. We at once mixed up the lot and asked him to separate the *caballitos* and the *ceritongos*. As rapidly as he could pick them up with the tweezers he separated the anisopteras from the zygopteras without a mistake. Several persons questioned were unable to give us the meaning of the word, but one gentleman thought that it was probably derived from *cerar*, to shut or block off, and *tonga*, a current of water.

ACKNOWLEDGEMENTS

In concluding this narrative we wish to thank many friends and acquaintances not mentioned by name, who gave us advice and assistance, and added to the pleasure and effectiveness of our trip. At all times we were shown the greatest courtesy and kindness by those with whom we came in contact in Colombia.

