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## THE MT. SANGAY LABYRINTH AND ITS FAUNA.<sup>1</sup>

BY ROBERT T. MOORE.

*Plates VI-VII.*

MORE than fifty years ago Edward Whymper, pausing in his triumphant descent from the first conquest of Mt. Chimborazo, the giant of the Ecuadorian Andes, caught sight of a formidable volcano nearly fifty miles to the southeast. The blasé conqueror of the Matterhorn was amazed at the outburst taking place before his eyes. He made drawings of the eruptions, which he then presumed were "outrushes of steam" and calculated the velocity of ejection, determining it as "twenty-two miles per minute"! Whymper undoubtedly witnessed the early stages of one of the major eruptions which take place at periodic intervals, ranging from a few years to fifty or more. Twelve years later in 1892, when writing his great classic,<sup>2</sup> he expressed astonishment that a volcano so formidable should be known to Ecuadorians "only by name"! Whymper did not seem to know that thirty-four years earlier Villavicencio had indicted Sangay as the "most frightful volcano in the World."<sup>3</sup> Nor did his book reveal acquaintance with the observations of non-Ecuadorian scientists and explorers who, for two centuries, had borne testimony to its devastating power.

As early as 1739 Monsieur de la Condamine witnessed a violent eruption which seemed to him "to set on fire the whole mountain

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<sup>1</sup> Contribution from the California Institute of Technology; Read at the Fifty-first Stated Meeting of the A. O. U., New York, November 14, 1933.

<sup>2</sup> *Travels Amongst the Great Andes of the Equator* by E. Whymper, p. 73.

<sup>3</sup> *Geografía de la Republica del Ecuador*, p. 51, New York, 1858.

and its crater," while a "burning river of sulphur and bitumen took its course in the midst of the snowy slopes."<sup>1</sup>

The geologist Reiss, moreover, gave an amazing testimony to its energy, when he stated that for four years without intermission a stream of incandescent lava flowed from the western shoulder of the volcano.<sup>2</sup> Many observers have noted that the roarings of the volcano have been heard in Guayaquil, one hundred and ten miles across the Andes, and sea captains far out in the Pacific have seen the decks of their vessels drifted with its ashes. So great is the mass ejected, Reclus assures us, that it would equal that of several mountains.<sup>3</sup> "It seems probable," adds Dr. Mozans, "that the disastrous earthquake which destroyed the old city of Riobamba in 1797 had its origin in Sangay. So complete and sudden was this visitation that few of the twenty thousand inhabitants were able to escape."<sup>4</sup> And then come the fables and legends which always cling to the skirts of terrifying phenomena. "Everyone had heard of the 'Flaming Terror to the East of the Andes,'" said Commander Dyott, "but no one had ever ventured near it. Within several leagues of its base (so ran the tale) were lakes whose waters spouted high in the air, drenching the country for miles around and forming a sort of water barrage."<sup>5</sup> And even the renowned Humboldt did not help dissolve this atmosphere of superstition by describing a fish, "*Pimelodus cyclopus*," which he says was thrown out in great numbers during minor eruptions of Cotopaxi, Tungurahua, and Sangay.<sup>6</sup> I have not space to quote from Wolf, Stübel, Hans Meyer, Stevenson, and many others who have observed the demonstrations of Sangay. A final quotation from the *El Telegrafo* at Guayaquil will suffice: "Alfonso Stübel . . . initiated an attempt to creep up on the shoulders of the colossus in April of 1872, but he, like G. M. Dyott, the intrepid Andean explorer, had to abandon the enterprise, their audacity punished by the imminence of destruction."<sup>7</sup> There seems to be no record that anyone actually

<sup>1</sup> See Ecuador by C. Reginald Enoch, p. 163, and *La Condamine, Voy.*, p. 77.

<sup>2</sup> Reiss, *Zeitschrift der deutschen geologischen Gesellschaft*, XXVI, p. 93.

<sup>3</sup> *Nouvelle Geographic Universelle*, Vol. XVIII, p. 422 by Reclus.

<sup>4</sup> *Along the Andes and Down the Amazon*, p. 76, by A. H. Mozans.

<sup>5</sup> *The Volcanoes of Ecuador* by G. M. Dyott in *National Geographic Magazine* for January, 1929. Also see book: *On the Trail of the Unknown*, by same author.

<sup>6</sup> *Zoology of Humboldt's and Bonpland's Journey*, Vol. 1, pp. 21-25.

<sup>7</sup> *El Telegrafo*, August 25, 1929.

crossed the snow-line until November of 1925,<sup>1</sup> when Commander Dyott after months of effort came to grips with the ice-field. On his first attempt he was struck down with snow-blindness and on his second fell into a dangerous crevasse on the southeastern shoulder, while his companion was incapacitated by siroche, both finally abandoning the effort. *El Telegrafo* concludes, "Sangay continued to guard its mystery inviolate—a mystery vast and sublime!"

Familiarity breeds contempt for mysteries, legends, and the fears that they produce. After one has threaded the abysses about the base of Sangay and surmounted its pall of cloud, a solution of these so-called mysteries becomes possible. Detached from the main chain of the eastern Andes, Sangay juts out over the Amazon basin, a lonely sentinel nearly 18,000 feet in altitude. Although only about one hundred and fifty miles south of the equator, the last half mile of altitude is covered with a crown of ice and snow. At the eastern base of the mountain begins an interminable plain of tropical forest which stretches without break three thousand miles to the Atlantic. So impenetrable are these jungles of the steep eastern slope that no one has made an attack on the summit from this side. On the other three sides are one thousand square miles of volcanic ash, which have been carved by tropical rains into a labyrinth of black canyons 500 to 2,000 feet deep. Down each one swirls an angry torrent—the whole constituting a veritable maze, whose deeper intricacies have never been threaded by the superstitious Indians living about its margins. They never cross its borders save for an occasional forage among the rare wild animals, who here have made their last stand in a sanctuary created by superstition. Above and about it all has been hung by Nature a vast shroud of mist and cloud, which is lifted but for brief intervals.

After twenty-six days of constant rains we climbed above the Shroud and at an elevation of 16,000 feet discovered its cause. Humid currents of air, superheated in the cauldron of the Amazon basin, are forced upward by the tendency of heat to rise. Ascend-

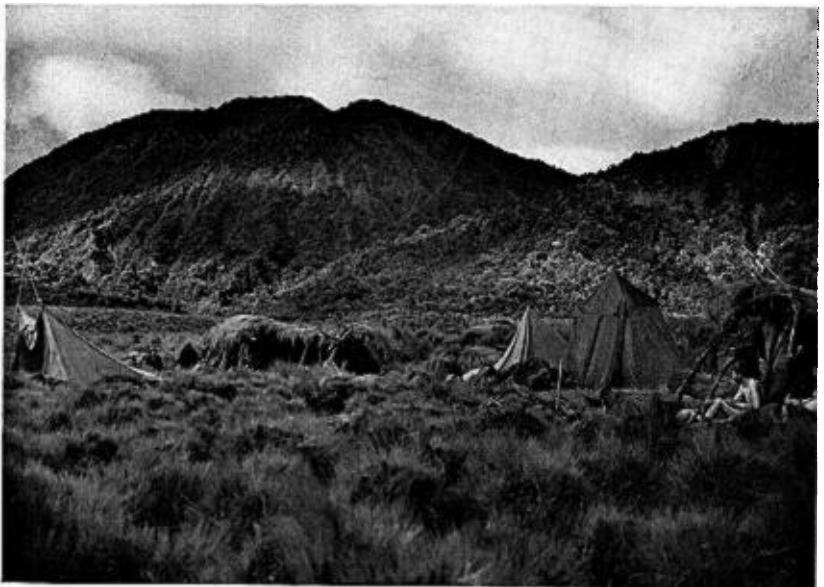
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<sup>1</sup> National Geographic Magazine, January, 1929. Commander Dyott does not state either in his book or article the year in which his effort was made. From other sources it seems to have taken place in 1925.

ing the 18,000 foot slope they enter an area, progressively cooling, and soon reach the frigid atmosphere about the snow-fields. The rapid decrease of temperature sucks the air columns upward at ever greater speed. The contact of heated currents with freezing temperatures results in rapid condensation and vast billowing clouds are born in a moment before the astounded eyes of the climber. This process keeps up for days, if not months, the "mushrooming" clouds joining the Shroud to the west and constantly recreating it at about the 16,000 foot level. The rains congeal on the upper slopes and thicken the collar of snow and ice. When Sangay blows off its cap, the snow-field dissolves in a moment and the Labyrinth at its base is choked with a stupendous deluge of water and ice, cascading down the precipitous sides. The melting ice and snow make the canyons boil and churn tumultuously and the enormous masses of ash, catapulted out of the crater, choke the canyons and destroy almost every vestige of plant and tree life. A few stunted trees seem to survive on the tops of the high ridges between the canyons, and the warmer conditions at the bottom during periods of quiescence create a scanty amount of shrubbery and small trees. On the sides of the gray canyon walls, except on the slopes of the northwest margin of the Labyrinth, are found today little else but clumps of a large grass with a sword-edge known to the natives as "paja." This would seem to establish all but the bottom of the canyons and a few tongues of tree growth, extending up the sides, as Paramo Zone.

A third impediment to explorers of this region lies in the superstitious fears of the native cargo bearers. Terrified by every manifestation of the great volcano, they abandon the explorer at sight of its white cone, appearing through a rift of the Shroud. Three times our party was deserted by different groups or individuals, which at Tres Aguas threatened disaster. With tents leaking, ammunition and food supplies wet and fires refusing to catch flame, our party was in danger either of being washed out or weakened by lack of food. A fortunate kill of deer relieved the tension until four days later a new group of Indians was brought up from Alao.

It seems strange that birds, possessing enduring powers of flight, such as Thrushes and Hummingbirds, would make their homes in



UPPER: MT. SANGAY FROM CULEBRILLAS VALLEY. JUNCTION OF HUMID TEMPERATE ZONE WITH PARAMO. LEFT CENTER, APERTURE OF CANON WHERE TEPHROPHILUS WAS COLLECTED.  
LOWER: CAMP SITE ON DRIER HUMP OF MORASS OF CULEBRILLAS VALLEY.

canyons such as these. The natives claim that it rains every day of the year in the Sangay area and our experiences offer no proof to the contrary. It actually rained every one of the twenty-six days of our safari. Even when we climbed through the Shroud, to the cone of Sangay, snow fell intermittently about the peak and the Indians, who refused to budge from the base camp at the 14,000 foot level, stated that the rains had continued during our two days' absence. Yet throughout this period several pairs of the Hummingbird, *Metallura atrigularis* Salv., continued to build their nests in a scattered colony among the overhanging grass roots and vines of a cliff at the bottom of one of the canyons. We had named it Dorado Valley from the name employed by them to designate this Hummingbird, under the belief it was the same as *Metallura primolina* Bourc., a bird of northern Ecuador with which they were familiar. They had overlooked the black throat of this mite. On July 27, 1929, I found what seems to be the first nest of the species to be discovered, at the base of hanging "paja" grasses, not three feet above the torrent of Dorado Valley. It was exquisitely situated beside a large rock in the stream. The Hummingbird flew to it several times, watched, making some additions to the nest which was practically completed. Eleven days later on August 7, after our return from Sangay, the nest contained two eggs nearly fresh and the female bird was collected as she was flying to it with a bit of white vegetable matter resembling cotton. In spite of the fact that the rains had continued incessantly throughout the period with only one or two respites of an hour's duration, the bird had stuck to her task, even though the nest must have been water-soaked from the bank above throughout the period. A nest of another Hummingbird, *Chalcostigma herrani* (Delatt. & Bourc.), was found on a perpendicular cliff about twenty feet above the water among some ferns and hanging vines that fairly dripped with water. The nest was discovered on July 19 by Terris Moore and yet on August 7 the female was observed repeatedly carrying material to it, although mist and drizzle were falling and water was dripping in streams from the plants about it and the outside of the nest itself. Despite the interval of eighteen days, no eggs had been deposited, and yet this Hummingbird had persisted in building operations throughout the depressing weather conditions.

On July 15, 1929, my party consisting of my son Terris Moore of Williams College, Waddell Austin of the University of California, Lewis Thorne of Yale University, and three Quichua collectors, with myself as leader, found ourselves in the public square of the Indian village of Licto. Here our genial host, Senor Alphonse Merino, on whose courtesies and thoughtfulness the success of our enterprise largely depended, introduced us to our caravan of eight horses and ten pack mules.

The following morning our equipment of tents and blankets, of guns and traps, of cameras, color plates and films, were packed on the backs of eleven Indians and off they dog-trotted up the valley of Alao. Here was a paradise of balmy Andean sun-light and gorgeous flowers. The latter grouped in great clumps on either side of the trail along the stream that leaped from rock to rock down the center of the valley. Calceolarias proffered great clusters of golden slippers. "Taxcus" climbed here and there through the thick growth and dropped overhead their great pink trumpets. Large patches of the orange parasite, called locally "picapus," brought beauty to the tree tops and lured the Sunbeams<sup>1</sup> to investigate. But the glory of the valley was the wild fuchsia. Superb scarlet bells hung in every conceivable line of grace, and tempted Hummingbirds of several species to explore their chalices. On all this loveliness of flower and dashing water the tropical sun shone with a balmy intensity found only in favored Andean valleys.

But beauty and sunlight had to be left behind when we began the steep ascent of the southern rim of the valley. For a while sunlit glimpses of the hacienda could be caught through the heavy tree-growth that clung to the lower walls, but shortly thereafter we reached the wind-swept paramo and under the wings of inquisitive Condors, began our long trek beneath the pall of cloud and mist, which we came to call, "The Shroud" of Sangay. From this time on rain fell every day for the next twenty-six with only occasional parting of cloud masses. Sometimes it drenched us with sudden outbursts, sometimes it swathed us in chill mist, but for the most part contented itself with a monotonous drip, drip, drip—day after day—that gradually sapped ambition and ren-

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<sup>1</sup> *Aglaeactis cupripennis cupripennis* (Bourc. & Muls.), a common but beautiful Hummingbird of high Andean valleys from 10,000 to 13,500 feet altitude.

dered minor chores a Herculean task. With the sunlight disappeared all semblance of a trail. Our first camp was pitched at the top of a high pass to the accompaniment of bleak winds and the howling of many dogs. The Indians insisted on taking these gaunt and ravenous creatures to help in hunting tapir and deer.

For thirteen days we followed the general course pursued by Commander George Dyott as far as his "Windy Ridge" camp.<sup>1</sup> Because of deserting Indians and other difficulties only about four registered progress. Throughout this period we occasionally happened on machete marks on shrub or tree, where Dyott had passed. After the thirteenth day we descended into deep canyons and never came across his marks again. It is impossible within the limits of this article to tell the many incidents and "near-disasters" of these difficult days. Kaleidoscopic views of rather loosely related events are the best I can attempt.

Towards the end of one day of almost constant climbing, we reached the top of a high pass. The wind howled through the gap on a temperature close to freezing and drove us down the opposite slope for protection. My field-notes remark: "Trails there are none, except the bed of a stream. For hours we have stumbled and slipped over hummocks of *paja*, forever stubbing our toes and dropping into concealed gullies. We are thoroughly soaked. Wading the icy stream seems preferable to the pounding that toes and ankles are taking. The earth has assumed the consistency of a super-charged sponge. We have forded many streams." As the light darkened and the billowing Shroud sagged into the valley, we located the remains of Commander Dyott's second camp-site in Culebrillas Valley. We pitched our tents in the driest spot we could find in the huge morass which filled almost the entire floor of the valley, and that same night obtained our first view of Sangay, seventy degrees E. of S. Incredibly high it stood against the southern sky, ghostly and wan in a flood of moonlight. It seemed to fill the whole end of the valley. And yet it must have been twenty-five miles away. But distance conveyed no feeling of safety, when an earthquake that night brought us to our feet!

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<sup>1</sup> The Volcanoes of Ecuador, by G. M. Dyott, in *National Geographic Magazine* for January, 1929. Also see his volume: *On the Trail of the Unknown*.



We had now reached the margin of the real Labyrinth. Our valley faced approximately southeast directly towards Sangay and not far away in that direction began the intricate system of canyons that we later termed the "Labyrinth." If we wanted to proceed very far into it, a route straight down the valley would mean nothing but endlessly crossing canyon after canyon. The valley wall on the southern side seemed to be heading in the approximate direction we wanted to go. It was decided that Lewis and Terris should climb the wall and follow it in order to ascertain if it continued for any distance and would afford an easier access to the heart of the Labyrinth. While this reconnaissance was being made, the rest of the party was to stay in Culebrillas and secure a representation of its bird-life. Comment at this point from my field notes forecasts the difficulties that were to come.

"Vinci, the leader of the peons, refuses to move with the reconnaissance party. He claims rheumatism! We suspect cowardice. He even refuses to let his peons advance without him, exclaiming 'There are no trails! We have to cut through with machetes!' A threat of punishment from his master, Senor Merino, brings him to terms. His sullen look as he leaves indicates no desire to cooperate."

As we watched the boys lightly plunge up to their waists into the main river, the rest of us gave attention to the exploration of the valley. The floor of it was fairly flat, except at the southeast end where it was broken up by the black front of an old lava flow, which probably had its origin in Sangay. The altitude was approximately 11,000 feet, whereas the mountains which framed in the valley rose to an elevation of approximately 13,000 to 14,000. The entire floor consisted of a vast water-soaked swamp of "paja," through which wound numerous small streams that emptied into the Rio Culebrillas. A fairly heavy tree-growth covered the lower slopes of the mountain walls but their low height and gnarled condition reflected the high altitude and severe climate. Small water-falls dropped here and there down the slopes through the tree-growth and attracted a few insects, which in turn lured the five species of Hummingbirds that were found in the valley. The most conspicuous was the large Hummer, *Pterophanes cyanopterus* (Fraser), its ultramarine wings flashing back and forth against the sunlit spray. It created a lasting memory of color and grace in

motion. The bird hurls through the air at great velocity for so large a Hummingbird and recalls the motion of its cousin, the Swift. The Sunbeam, *Aglaeactis c. cupripennis* (Bourc. & Muls.), the green-frontleted *Helianthea lutetiae* and *Lafresnayeia l. gayi* (Bourc. & Muls.) with its black velvet abdomen and long curved bill were scarcer denizens of the woodland growth. No doubt they fed from the clustered corollas of the parasitic orange "picapus," which in places festooned the moss-covered trees. Of *Metallura atrigularis* Salv., another frequenter of the paja-draped stream beds and hitherto known only from the Sigsig region to the south, I have already spoken. Individuals of the first and last of these species were very common. This seems strange in view of the bleak nature of the valley and the scarcity of both flowers and insects. All told eight different species of Hummingbirds were found in the Sangay area, which might be described as a wilderness of volcanic ash, relieved only here and there by scattered, stunted trees and practically barren of flowers.

But the most conspicuous bird of the valley, because of its abundance and size, was the Snipe, *Capella nobilis* Scl. At every movement through the central marshes, it hurtled into the air and provided an abundant food supply. At sundown ecstatic forms whirled overhead to the accompaniment of strange sounds that reminded one of a deep-pitched policeman's rattle. The old Quichua, Carlos Olalla, insisted that these represented a larger form of Snipe, which he sometimes termed "Sumbador negro." Subsequently specimens were secured of the large gray Snipe, *Capella jamesoni* (Bonap.). The night calls may have represented this species. High up on the paramo of the mountains above Culebrillas Valley, a specimen was taken of the Tinamou, *Nothoprocta curvirostris* Scl. & Salv. A nest with eggs of this short-tailed bird was found on Mt. Pichincha in northcentral Ecuador. A Rail was collected by the author which proved to be a race of our own *Rallus limicola*, namely, *aequatorialis* Sharpe. The lower tail-coverts are largely white, as was noted by Dr. Chapman in specimens from the La Carolina marshes near Quito. Two Ducks were found in the streams, *Nettion andium* (Scl. and Salv.) and *Merganetta colombiana* Des Murs, but neither was conspicuously common. These Ducks were remarkably shy, a characteristic true of

all of the birds of the Sangay area. I attribute this to the fact that such birds as confine themselves to this region rarely or never see human beings, even Indians. The most persistent sound from the marshes was the loud, low-pitched call of the long-legged *Grallaria monticola*, Lafr. This bird dashed about in the runways between the tall clumps of paja and was very difficult to flush. On one occasion I had the opportunity of observing it calling when only a few feet from me. It raised its entire body as well as head and stretched its stilt-like legs to the full limit. When the call was completed, the bird collapsed like a jack-in-the-box. A smaller Ant-Thrush, *Oropezus rufula rufula* (Lafr.), of distinct cinnamon cast, was either much scarcer or else more difficult to flush. Fly-catchers of two or three species haunted the scattered bushes on the dry mounds of the swamp and two large members of the Thrushes, *Turdus fuscater gigantodes* Cab. and *T. chiguanco conradi* Sal. & Fes., confined themselves to the margins of the tree-growth on the sides of the valley. Down at the southeastern end the Rio Culebrillas crossed over to the north side along the front of the lava flow and cut its way down towards the first deep canyon of the Labyrinth quickly reaching the Humid Temperate Zone. Here tree-growth was heavier and in it was found the first Tanager—a large and extremely beautiful bird in green, yellow, blue and black. It proved to be a new race of *Buthraupis eximia*. Two other Tanagers were obtained in the Sangay area, one, a new species, which will be mentioned later; the other, *Dubusia taeniata* (Boiss.), was met with only twice. It is rather interesting that all three of them are included in Sclater's division of the Thraupidae, which he calls "Tanagrinae fortirostres." Two large birds were observed in the valley, one being collected later on the mountains, namely, *Ibycter carunculatus* (Des Murs); the other a handsome red-backed *Buteo*, either *polysoma* or *poecilochrous*, was seen several times. Two individuals of the latter were observed on a dead tree by the Rio Culebrillas a few hundred yards from our tent. One bird was tearing to pieces a freshly killed rabbit and the other, presumably an immature, was getting most of it. The natives call this bird "Aigula" the equivalent of Eagle. A month and a half later I collected a male and female, presumably *B. poecilochrous*,<sup>1</sup>

<sup>1</sup> See Chapman (*Dist. Bird Life in Ecuador*, pp. 227, 229, on difficulty of differentiating this from *B. polysoma*).

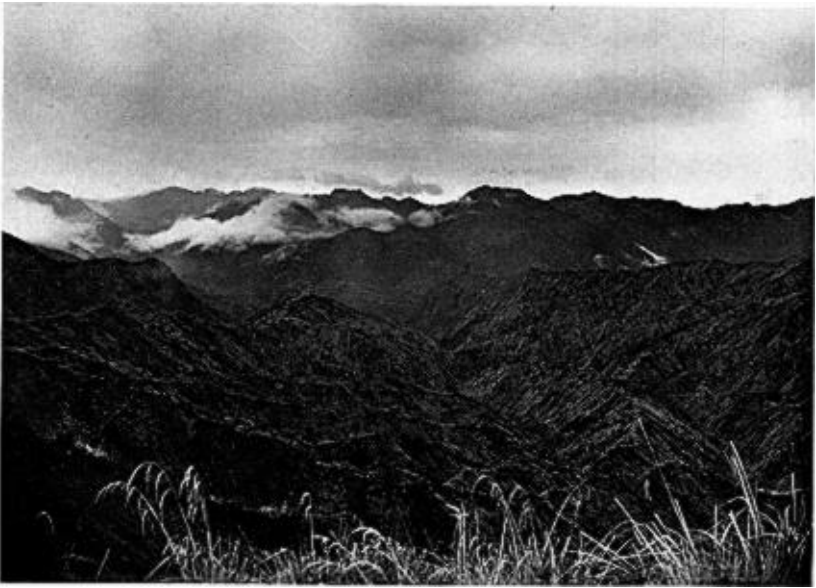
on the northern cliffs of Mt. Chimborazo at an elevation of about 17,000 feet. They were building a nest on a precipitous cliff. The proved mating is interesting as the female is in the dark phase.

Of all the birds of the valley, the species that interested me most consisted of four belonging to the Furnariidae—*Leptasthenura andicola* Scl., *Asthenes flammulata flammulata* (Jard.), *Schizoeaca fuliginosa* (Lafr.), and *Margarornis perlata* (Less.). These birds fed among the drier parts of the morass and, when flushed, flew furtively to the small bushes that dotted the humps of the valley floor. The last with its brick-colored back and large guttate yellow spots, thickly arranged on the olive background of its breast, is an extraordinarily striking bird. Even in the dim light of the Shroud, that was always over our heads, these yellow spots like great tear-drops stood out sharply and lent the only touch of brightness and cheer among the dismally colored birds of the marsh. On the other hand *Schizoeaca* is typical of the duller colored birds, all brown and gray, but its narrow tail feathers with their incomplete barbules somehow recall certain very delicate ferns. The most interesting fact regarding the presence of these four species is that *Margarornis perlata* has been assigned to the Humid Temperate Zone and the other species to the Paramo Zone by Dr. Chapman in his excellent work on the 'Distribution of Bird Life in Ecuador.' With exception of one of the paramo species,—*Leptasthenura andicola andicola* Scl.,—they were all common in the same large swamp with the Snipe, *Capella nobilis*, which, according to Dr. Chapman is chiefly a Temperate Zone bird "ranging upward to the Paramo." The grass-covered floor of the valley certainly has the general appearance of the paramo, but the tree-growth on the borders at the base of the mountain walls forms a continuous connection with the heavier tree-growth of the canyon at the southeast end of the valley and has undoubtedly induced the species of the Humid Temperate Zone to follow the scattered shrubs out on to the floor of the valley. With all hands collecting and Carlos continuing to operate during our absence in the deeper mazes of the Labyrinth, we secured 223 specimens in Culebrillas Valley, including some species not mentioned above, which I feel is quite representative of the bird life there for the summer months.

On the third day Terris and Lewis returned with a luring account of a volcano that stood stark and gaunt on the skeletal ribs of the Labyrinth, and of a lofty watershed, bisecting it, which proffered an opportunity to climb over its canyons. On the following day, leaving all heavy equipment with Carlos at Culebrillas, the main party crossed Mt. Dorado to the south at an approximate elevation of 14,000 feet, laboriously cutting a way through the gnarled tree-growth with machetes, and plunged down into the wilderness on the other side of the range. My notes remark: "We followed the stream through its boggy home. The paja butted our toes. The torrent filled our boots at unexpected crossings. We slipped in countless mud holes. Late in the afternoon we reached the junction of three rivers, completely 'bogged' as the boys expressed it." A mile from our camping place we passed by the water-soaked cliff where Terris on the reconnaissance had discovered the nest of the fiery-throated Hummingbird, *Chalcostigma herrani* (Delat. & Bourc.). The mossy bottom of the nest in a niche of the cliff was soaked like a sponge and continuously dripped water down the rocks. Nevertheless, the interior was dry. The perseverance of these birds was almost beyond human comprehension. That this feathered electron, splashed with the glorious fire of the tropics, should choose a barren water-soaked wilderness as an abode, left the mentality of luxury-craving humans in complete coma. Incidentally, this nest proved that one species of Hummingbird can tolerate another, for it was placed in the same cliff with the several nests of *Metallura atrigularis* mentioned previously. At the foot of the cliff a pair of the curious Spine-tailed Duck, *Merganetta colombiana* Des Murs, were holding their position against the fierce torrent.

On the right hand side of the narrow valley a fifty foot waterfall spectacularly dropped over a cliff beside an enormous bunch of paja grass which swung its streamers in the clear fifteen feet in length. Beside it, two female Metalluras were building their nests as were also Swallows, *Orochelidon murina* (Cass.), and a bird known locally as the "Chungui grande," *Upucerthia excelsior excelsior* (Scl.).

The Indians named the junction of the rivers which they had never seen, "Tres Aguas" and the main river "El Negro." My notes exclaim: "We are facing the Negro! In its angry waters lurks disaster. The peons refuse to build an adequate 'chozo.' They



UPPER: LABYRINTH LOOKING NORTH FROM EDGE OF CLIFF AT CARNECERIA. CULEBRILLAS VALLEY LIES AMONG MOUNTAINS IN LEFT BACKGROUND.  
LOWER: CAMP SITE AT ACTUAL BASE OF MT. SANGAY. HUMMINGBIRD (CHALCOSTIGMA STANLEYI) WAS NESTING IN ARROYA POCKET AT RIGHT.

huddled all night and arose wet and disgruntled. The 'waterproof' covers of our sleeping bags leak like sieves. Films and cartridges are wet. The drenched wood cannot be coaxed into flame. We eat cold meals. We are in a cul-de-sac between mountain walls and can see nothing but fog and mist. Even the two faithful Quichuas are discouraged. When I gave orders to cross the river, the peons revolted. They claimed I was trying to drown them, and added that, if a crossing could be accomplished, the daily rains would swell the river to frightful proportions and prevent a return." Nine of them fled over the mountain, taking with them our only meat—portions of a deer.

A few days later with a fresh group of peons, a crossing was negotiated and we climbed to the tops of the mountain ridges again. At one point we were startled by the sudden appearance of a tiny Hummingbird, darting amidst the fantastic stunted growth that had collected in a gap of the knife-edge. When I picked it up, I discovered it was a female of the extraordinarily beautiful purple-breasted and golden-headed *Rhamphomicron microrhynchum microrhynchum* (Boiss.). Following a knife-like watershed, which gave uncertain footing on its jagged edges, we came to a jutting escarpment, which we called Desolation View. One set of notes remarks: "No one can exaggerate the ghastly panorama that fills the enormous basin below us. It is the Grand Canyon all over again, but this time done in blacks and livid grays and filled with a spectral atmosphere under the impending Shroud." We followed the watershed wherever it twisted and turned through the Labyrinth. Late one afternoon it widened into a plateau, approximately 13,000 feet in altitude and covered with endless paja and a few stunted trees. We camped on the edge of a cliff, nearly 2,000 feet in altitude, which gave awe-inspiring views of the Labyrinth below. From this time on, because of the diminishing number of Indians, double trips had to be taken to previous camping places to bring up supplies. Characteristically disregarding his now badly infected feet, Terris performed most of this double duty. Our faithful Quichua, Teodomiro, was in still worse shape from constantly walking on the gritty ash. Reluctantly we were forced to leave him behind at this camp, which we called Carneceria. The killing of a tapir and a deer by the leader provided Teodomiro

with plenty of food, as well as a supply for our arduous trip in the Labyrinth to come. The tapir proved to be the rare high mountain form, *Tapirus roulini*. Subsequently by the offering of an enormous reward, two fresh Indians were induced to carry out the heavy skin and skull of this beast.

That night the Fire-throat (*Chalcostigma herrani*) visited us again. Like a visitor from some other world, it volplaned out of the ether and dropped onto the only flowers of the paramo—a few yellow clusters on a strange, gnarled, pear-like tree, which hung dizzily over the cliff. For one dazzling moment it hovered before me—took one sip of chilled nectar—and was gone! But that one moment of whirling tracery and iridescent fire had impacted on brain and soul a memory that would ever be challenge to feeble limbs to follow and weak brain to explain.

A most efficient reconnaissance by Lewis caused us to take the plunge into the canyons. Scanned in the calm of my home, my notes seem rather "purple" and pessimistic. At any rate they were immediately recorded and sincere impressions of a trying situation. They read: "The rains have turned the ash into a jelly-like paste. There is no trail! With heavy loads, neither ourselves nor the peons can proceed until steps are laboriously hacked into a slippery series of steps. It is all a phantasmagoria—icy streams—raging torrents—moss-covered blocks of lava, that proffer treacherous footholds—steep slopes and cliffs always facing us on opposite sides of streams—dripping clumps of paja massed to block ascents and lacerate hands that grasp—endless paramos on top of this sponge-like world—gnarled trees that block progress along knife-edges—attempts to crawl through interstices with sure knowledge that one slip will mean a plunge into the canyons on either side—and always stream after stream, torrent after torrent, and fords so numerous that definite memory will surely fail. At length we reach the Volcan!"

Here in the very depths of the Labyrinth was a narrow valley, which ascended one of the affluents of the main river of the Volcan. Before us loomed a dark narrow cleft in the mountains which gave access towards the great volcano.<sup>1</sup> Beyond was an

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<sup>1</sup> On August 4, 1929, our party of three Americans, after two days on the ice-field hacked toe-holds on the steep slopes with ice axes and, with the aid of ropes, reached the ice-draped rim of the inner crater, completing the first successful ascent of this giant volcano. Plans for a new expedition to explore the Labyrinth are completed.



amphitheatre of cliffs over which dropped numerous veil-like waterfalls. Some thick shrubs, not over fifteen feet high, and a quarter of a mile in extent, had clumped themselves in the bottom of the valley along the stream, having somehow developed in the ashes since the last great eruption. As I pushed my way through the dripping branches, I caught sight of a glittering creature of gold, green and black, obviously a tanager, considerably larger than our Scarlet Tanager, and adorned with black wings and tail, its two azure wing patches and its golden breast showing brightly through the drizzle. Shy like all the birds of the Labyrinth, it flitted furtively through the tops of the shrubs. A quick shot resulted in its fall and floating feathers in the air. But so dense were the grasses and so intertangled the vines that search as we did for over a half hour, no further sign of the bird could be found. Subsequently, on our return to Culebrillas Valley, three specimens were obtained of this beautiful new species,<sup>1</sup> a male and two females. They were secured in the thicker growth of trees at the southeast end of the valley where the Rio Culebrillas plunges down toward the canyons of the Labyrinth. The growth here can be described as a tongue of the upper Humid Temperate reaching up towards the Paramo Zone of the main floor of the valley. But the bottom of the canyon where I secured the first specimen mentioned, although probably lower in altitude, gave no evidence of the Sub-tropical Zone, and was distinctly Humid Temperate. Probably this Tanager will be found more abundant in the denser growth of this Temperate Zone where the main canyon starts down towards the great basin of the Amazon, but I feel certain that its habitat does not extend very low. Were it common in the Humid Sub-tropical Zone, it surely would have been obtained before by the many expert collectors and ornithologists who have taken extensive series of many species from this zone at points not far to the south, northeast and west of the Sangay area. It seems almost certain that this Tanager, so totally distinct from all other species of the family, must be confined chiefly to the bottoms of the intricate canyon system of Sangay. The speculation that it is strictly a Humid Temperate species will suggest the cause for its isolation, for the extensive treeless area of the Paramo Zone on the

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<sup>1</sup> *Tephrophilus wetmorei* Moore, see Auk, Jan., 1934, p. 1.

high mountains to the north and west would create an effective barrier in these directions. The vast ice-field of Sangay blocks escape to the south and an exit from the Labyrinth can be accomplished only through the Sub-tropical Zone, down the main canyon as it plunges eastward into the Amazon basin.

Other species were found in this area and exotic forms of Trochilidae, such as the snow-defying *Chalcostigma stanleyi stanleyi* (Bourc.),—the last attempting to build in a small barranca, not 500 feet below the ice-fields of Sangay, but even these doughty mites of the feathered world could not eclipse the astonishment, created by the presence of the exquisite Tanager, which for ages had defied the terrific eruptions of Sangay. In spite of decimated numbers the refugees have returned, when the fury of the great giant has ceased, and once more have made their abode in their chosen haunt at the bottom of bleak and inhospitable canyons.

*California Institute of Technology,  
Pasadena, Calif.*