
*An Ornithological Survey of the Serra
Do Itatiaya, Brazil*

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Article V.—AN ORNITHOLOGICAL SURVEY OF THE SERRA DO ITATIAYA, BRAZIL

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PLATES VI TO XIX

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INTRODUCTION

In southeastern Brazil, near the point where the States of Minas Geraes, Rio de Janeiro, and São Paulo meet, the huge mountain mass of Itatiaya lifts its final pinnacles nearly nine thousand two hundred feet above the sea. For half a century it was proclaimed the highest point, not only of Brazil, but of all South America east of the Andes and, though recent surveys have relegated it to second place,¹ the great

¹By simultaneous barometric observations, Dr. Alvaro A. da Silveira, Chief Engineer of the Comissão Geographica e Geologica do Estado de Minas Geraes, on September 27, 1911, computed the altitude of the Pico da Bandeira, Serra do Caparaó, as 2856 meters, thus exceeding by 52 meters the most careful determination that had until then been made of the height of the Pico do Itatiaya. These data were published in 'Minas Geraes,' Bello Horizonte, in 1912, and occasioned quite a controversy with the proponents of Itatiaya's supremacy. Silveira subsequently made two more barometric measurements of the Pico da Bandeira (cf. 'Memorias Chorographicas,' Vol. 1, 1922, pp. 39-72), which resulted in a slight modification of his figures; but the question remained unsettled until the first half of 1922, when Dr. Adolpho Odebrecht, an engineer of the Secção de Cartas Geographicas, Repartição dos Telegraphos of the Brazilian federal government, ran lines of levels up the two peaks. Dr. Odebrecht's surveys show the Pico da Bandeira to be actually 71 meters higher than Itatiaya, the exact altitude of which he determined as 2790 meters.

majority of Brazilians still hail it as their king of mountains. It is not surprising then that Itatiaya has long held much of romance for the layman and even more of interest for the scientist.

As early as 1856 the Serra do Itatiaya had attracted the attention of the geographer, and in that year Massena offered to the Instituto Historico do Brazil a paper¹ claiming Itatiaya to be the empire's mightiest mountain, but advanced no data to support his assertion. In 1867, however, he published a paper in which was given the result of a combination barometric and trigonometric calculation of the altitude of Itatiaya as 2994.5 meters. This figure is handed down to this day, though the determination of 2804 meters, made in 1895 by Dr. Augusto de Vasconcellos and generally accepted by cartographers, was a very close approximation to the actual height of the mountain.

Massena was followed by Glaziou, Mello, Derby, Ule, Dusén, Moreira, Lüderwaldt, and others, working severally in the fields of geography, geology, botany, and zoölogy, but heretofore no complete survey of any aspect of the natural history of the region has been attempted.

In connection with the American Museum's study of the life-zones of the Andes it was deemed desirable to investigate another elevated region in South America in order to obtain data with which to supplement the Andean work. Itatiaya, towering high above all neighboring peaks—a giant among its brethren of the same mountain system—and separated by 1200 miles of comparatively low land from the nearest outlying spur of the Andean chain, offered an exceptional *locus* for such a study. This locality seemed especially promising, too, because of the fact that certain Colombian and Peruvian bird species had been reported from the mountain by previous students.

Thus, through the kindness of Dr. Frank M. Chapman, Curator-in-Chief of Birds, it became my good fortune to be assigned an ornithological survey of the Serra do Itatiaya. In the accomplishment of this charge I spent the period between December 12, 1921, and April 30, 1922, upon the mountain, bringing together a collection of 559 birds, as well as a few mammals, reptiles, amphibians, and insects, and making such investigations as were pertinent to the undertaking. The ornithological results of this study are contained in the pages which follow.

Although my observations extended over a period of four and a half months, and the accompanying list of 187 species, comprehending all

¹Not published until 1876 (see Bibliography).

previous records, more than doubles the number heretofore definitely known from Itatiaya, to claim that the ornithological possibilities of the region have been exhausted would be but an admission of ignorance of the wealth of Brazilian avifauna. With a few notable exceptions, local lists of birds are practically non-existent for Brazilian localities, and those that do exist contain no data on altitudinal distribution. Therefore it is hoped that, notwithstanding its imperfections, the present report will serve at least as a foundation upon which zoögeographers may safely build.

PHYSIOGRAPHY

GEOGRAPHIC POSITION.—The geographic position of the Pico do Itatiaya is approximately 22° 24' S., 44° 50' W. (of Greenwich).¹ The main peak marks the boundary between the States of Minas Geraes and Rio de Janeiro, while the line between São Paulo and Rio de Janeiro passes but a few kilometers to westward; therefore the mountain may be most readily located on a map by its relation to the conjunction of these three states.

It should be stated here that practically all of my bird records hereinafter cited refer to the State of Rio de Janeiro. The same is true of the records of other authors.

GEOLOGY.—Arising at the approximation of three great mountain systems, the Serra do Itatiaya is generally conceded by geologists to be one of the most interesting sections of all Brazil. According to Derby (1885 and 1889) the rocks of the general region are crystalline, belonging to the groups of gneisses, granites, metamorphic schists, quartzites, etc., and the stratification is always highly inclined and disturbed. The massif of Itatiaya proper, however, is foyaite or nephelene-syenite, and has been designated a "parasitic mountain." That is, it is composed of materials displaced by volcanic action after the upheaval of the range of which it forms a part, and superimposed on the range proper. Thus it will be seen that the mountain is truly eruptive, if not actually the denuded remains of an ancient volcano, and is therefore different in age, composition, and mode of origin from the surrounding territory, which has been produced by other orogenetic forces. This relation is graphically shown on Branner's map (1919), where Itatiaya is represented as an igneous protrusion through an Archean field. Hence its geologic age must be between Cretaceous and Triassic.

TOPOGRAPHY.—"The topographic characteristics of the region," says Derby (1885), "are similar to those noticed in the neighborhood of

¹Ferraz, 1922.

Rio de Janeiro and along the D. Pedro II Railroad,¹ that is, hills, peaks, and ranges, rounded, saw-toothed, or ragged, of very varied forms and elevations." This is exactly what would be expected when its geologic origin is considered.

Viewed from the valley of the Parahyba, which it hems in on the north, the Serra do Itatiaya presents a mass that is truly imposing. This is but faintly suggested in the accompanying photograph (Pl. VIII, fig. 1) on account of the clouds and also because of the elevated ridges which cover the highest points from the Campo Bello side. From Rezende, however, if the atmospheric conditions are propitious, the peak is seen as an enormous pyramid rising more than 7800 ft. above its base in the plains of the Parahyba.

At Campo Bello, Itatiaya overlooks the elevated treeless plateau of the Serra da Bocaina, a portion of the Serra do Mar system which is here folded sharply inward and is separated from Itatiaya by only the Rio Parahyba and some 20 miles of rounded hills.²

Though distinct enough, topographically, to justify its separate appellation, the Serra do Itatiaya is, strictly speaking, a part of the Serra da Mantiqueira, and any inquiry into the origin of its fauna must take into account this connection with the Serra da Mantiqueira and, through it, with the "Serra do Espinhaço" system of Derby. On the other hand, Itatiaya is so much higher than any other part of the Mantiqueira system that it is natural to expect peculiar forms to develop in this environment no matter whence came the original stock. And such is the case, at least in some groups.

At an elevation varying between approximately 7000 and 7500 ft., the upper slopes of Itatiaya, known as Alto Itatiaya, present much the appearance of an undulating plateau made up of low rounded hills and broad ridges (Pls. XII and XIII). Above this secondary base rise masses of naked rock shattered and heaped up into every conceivable form (Pl. VII, fig. 1).³ The largest and strangest of these nude piles is a long dentate ridge, called the Agulhas Negras (Black Needles⁴), which stands about 1200 ft. above its base, and for the last half of this distance is practically vertical (Pl. VI). This is the highest peak of the mountain, and the view from its summit is unobstructed and superb.

¹Name changed to Central do Brazil when, in 1889, the empire became a republic.

²A zoological survey of the Serra da Bocaina to supplement the present work on Itatiaya should be most instructive in a study of the faunal relations between the Serra do Mar and the Serra da Mantiqueira systems, for at no other point are the two so closely juxtaposed.

³Potholes and flutings have led some to believe Itatiaya glaciated, but there can be no doubt that these phenomena are due to the action of rain. The rounded outlines and exfoliate boulders (Pl. VII, fig. 2) are produced by concentric weathering of massive rock (Branner, 1896).

⁴Inasmuch as these pinnacles are neither black nor needle-like, the aboriginal name, Itatiayassú (Grand Itatiaya), is considered far more appropriate. Agulhas Negras is adopted simply because the peak is so known to most of those familiar with the mountain.

The torrential rains falling upon Itatiaya give rise to several important streams which send their waters to the sea through two distinct river systems, the Plata and the Parahyba. The Rios Ayuruoca, Preto, and Campo Bello spring from almost the very base of the Agulhas Negras, and in their passage down the mountain side have cut deep clefts, immense ravines, within which smaller streams have worn secondary ravines (Pl. X, fig. 2). The cañon of the Campo Bello, with its endless ramifications, was the principal field of my investigations.

CLIMATE.—The salient feature of the climate of Itatiaya is superabundant rain. It is true that my stay upon the *serra* was coincident with the rainy season, but it is natural to assume that a mountain wall rising more than nine thousand feet above the sea, and intercepting so near their source the moisture-laden winds from the South Atlantic, would receive excessive precipitation at all seasons. That this does occur is evident from a moment's study of the accompanying tables. In fact but nine pluviometric stations in Brazil report a greater mean annual rainfall than Alto Itatiaya. These compare as follows:

Alto da Serra, São Paulo	3695.6 mm.
Benjamin Constant, Amazonas	3106.1 "
Remate de Males, Amazonas	2819.0 "
São Felipe Amazonas	2691.3 "
Barreiros, Pernambuco	2559.9 "
Therezopolis, Rio de Janeiro	2533.9 "
São Francisco de Paula, Rio Grande do Sul	2389.6 "
Piassaguéra, São Paulo	2378.9 "
Porto Velho, Amazonas	2294.3 "
Alto Itatiaya	2293.3 "

Inclement weather often rendered collecting very difficult, especially at Alto Itatiaya. More than once I was held indoors for two entire days by rain, and during the first ten days of March, 1922, the government instrument at Alto Itatiaya recorded just ten hours of sunshine. Some rain falls here 193 days of the year, while clear days average only 55. Actual rain, however, is not necessary to drench the vegetation, and make miserable the life of the collector. Cold winds blowing almost ceaselessly over the heights drive before them drizzle-spitting clouds which sweep the ground and reduce to phantoms the rocky peaks and to mere ghostly outlines the queer gnarled trees of the dwarf-forest copses, often blotting them out altogether. Alto Itatiaya smiling in the sun is an enchanted region, but under a lowering sky or wrapped in a cold blanket of mist it is indeed an awesome, cheerless place. Sometimes the changes from cloud to sunshine are rapid, though too often cloud follows cloud without inter-

mission. Dripping clothing and soaked boots are only a part of the day's work, but when fog enshrouds the *campos* collecting is brought to an abrupt halt, for nothing can be seen to collect. The heavy forest above the Ponte Maromba is scarcely less wet; cloud-fogs, however, are not so frequent below the *campos*.

In the accompanying tables the temperature and rainfall of the Serra do Itatiaya are summarized and then compared with data from other selected stations in Brazil. This comparison shows the temperature of Alto Itatiaya to be the lowest of any station in the country.

TABLE I
TEMPERATURE AND RAINFALL ON THE SERRA DO ITATIAYA

MEAN	MONTE SERRAT (2700 ft.) 6-year period, 1915-1922		ALTO ITATIAYA (7150 ft.) 8-year period, 1914-1922	
	Temperature Degrees C.	Rainfall mm.	Temperature Degrees C.	Rainfall mm.
Annual	18.1	1707.8	11.5	2293.3
6 warmest and wettest months				
October-March	....	228.5	12.9	306.6
November-April	20.1	.....	....	.....
6 coldest and driest months				
April-September	....	52.9	10.1	75.6
May-October	16.1	....	....	....
3 warmest and wettest months				
Dec., Jan., Feb.	....	297.5	13.4	364.3
Jan., Feb., Mar.	20.9	.....	....	.....
4 coldest and driest months				
May, June, July, August	15.3	35.3	9.3	50.7
Warmest and wettest month				
January	....	379.0	13.7	404.2
February	21.3	.....	....	.....
Coldest month				
July	14.4	.....	8.8	... ..
Driest month				
May	....	.....	....	47.6
June	....	29.6	....	.....
ABSOLUTE				
Maximum	35.3	2026.5 ¹	23.1	3129.4 ¹
Minimum	0.4	1445.3 ¹	-6.0	.....

NOTE.—Alto Itatiaya data were computed on the spot from the records of the meteorological station there, while the figures for Monte Serrat were calculated from station reports on file in the Directoria de Meteorologia, at Rio de Janeiro. Permission to publish these data was most courteously granted by the Director, Dr. Sampaio Ferraz.

¹Annual.

TABLE II
COMPARATIVE TEMPERATURE AND RAINFALL

	Observation Years	Altitude Meters	Temperature Degrees Centigrade			Rainfall Mean mm.
			Mean	Max.	Min.	
Manáos, Amazonas	9	44.9	27.2	38.6	19.0	1954.1
São Luiz, Maranhão,	7	20.0	26.3	33.1	20.2 ¹	2048.8
Quixeramobim, Ceará	24	207.0	27.5 ¹	37.3	17.9	657.4
São Gonçalo, Ceará	7	.....	.....	.....	.....	447.9 ²
Barreiros, Pernambuco	7	725.0	23.3	32.8	15.7	2559.9
Pão de Assucar, Alagoas	6	49.0	25.8	40.2	14.0	604.1
Serra do Itatiaya						
Alto Itatiaya	8	2186.0	11.5 ²	23.1 ²	-6.0	2293.3
Monte Serrat	6	826.0	18.1	35.3	0.4	1707.8
Therezopolis, Rio de Janeiro	6	910.0	16.6	32.2	0.1	2533.9
Rio de Janeiro, Dis- trict Federal	39	61.4	22.6	39.0	10.2	1146.4
Angra dos Reis, Rio de Janeiro	6	3.8	21.0	42.1 ¹	9.4	1665.3
Alto da Serra, São Paulo	44	800.0	17.8	34.0	0.0	3695.6 ¹
Curityba, Paraná	25	908.0	16.4	37.4	-8.9 ²	1452.0
Uruguayana, Rio Grande do Sul	8	374.5	19.5	42.0	0.0	1351.1
Cuyabá, Matto Grosso	9	165.0	26.6	37.2	9.9	1460.2

NOTE.—Excepting the data for the Serra do Itatiaya, these figures were compiled from the reports of Ferraz (1922), Torres (1926), and Morize (1927).

Table II is especially interesting when studied in connection with von Ihering's zoögeographic map ('As Aves do Brazil,' 1907, Plate II). The fact that Barreiros, Pão de Assucar, and Cuyabá are included in the same division of a fauna indicate that some modification of his faunal boundaries is necessary. Reasoning from a strictly climatic standpoint, one would expect Itatiaya to show closer faunal relations with the Organ Mountains, in which Therezopolis is located, than with any other station considered, and the opinion is ventured that field work would justify this assumption.

PLANT REGIONS

Although the flora of Itatiaya has attracted a great deal of attention, no intensive botanical survey of the *serra* has yet been made. Neither has anyone attempted, except incidentally, to delimit the plant-zones of

¹Maximum for Brazil.

²Minimum for Brazil.

the mountain. But an ornithologist can not presume to supply the want of conclusive data in another's field of science; therefore, to present even an outline of plant-zones, he must rely upon this incidental work of the botanical authorities.

Ule (1896), who was the first to present a classification of the plant-zones of Itatiaya, divides the *serra* into three regions, and further divides the highest of these into five subregions, giving lists of plant types which characterize each division. Hemmendorff (cf. Moreira, 1903a) follows Ule in the main, but does not subdivide the Campo Region. I would reduce Ule's five subregions to three—Campos, Bogs, and Dwarf Forests—but all are given here for the sake of his characterizing species, which are listed under their respective divisions without further explanation. In the scheme which follows, the classifications of Ule and Hemmendorff are combined, with such modifications as my own observations seem to warrant.

PLANT REGIONS OF ITATIAYA

FOOTHILL REGION (1400–2000 ft.; Pl. VIII, fig. 1).

This region, characterized by a rarity of trees and predominance of grasses, owes its existence as a separate zone entirely to culture.

Solanum grandiflorum
Aristolochia cymbifera
Pavonia sessiliflora

Haynaldia thapsoides
Typha domenigensis
Eichhornea azurea

FOREST REGION (2000–6000 ft.; Pls. VIII, IX, and X).

A region of forest trees covered with representatives of the families Araceæ, Bromeliaceæ, and Orchidaceæ. With increasing altitude the trees become lower, and two species of bamboo more dominant.

Lauraceæ
 Meliaceæ
 Myrtaceæ
 Leguminosæ
 Rutaceæ
 Sapindaceæ

Cecropia
Tibouchina
Euterpe edulis (up to
 4600 ft.)
Croton (arborescent)

CAMPO REGION (above 6000 ft.).

A zone of grasses, sedges, herbs, bushes, and dwarf-forest copses, distinguished principally by an abundance of mosses and lichens.

- (a.) Campos up to 6500 ft. (Pl. XI).
Araucaria brasiliana *Polygala lancifolia*
Escallonia montevidensis *Arenaria lanuginosa*
Lupinus vaginans
- (b.) Campos up to 7900 ft. (Pls. XII, XIII, XV, XVIII, and XIX).
Escallonia clausenii *Oxalis glazioviana*
Glechon *Erigeron maximus*
Alophila *Amaryllis*
- (c.) Rocky Heights (Pls. VI, VII, and XVII, fig. 1).
Maytenus boaria *Wienmannia paullinæ-*
Griselina ruscifolia *folia*
Barbacenia squamata *Tibouchina hospita*
- (d.) Bogs (Pl. VII, fig. 1).
Carex *Juncus*
Rhynchospora *Baccharis megapotamica*
Eragrostis *Ranunculus bonariensis*
- (e.) Dwarf Forests (Pls. XII, XIV, and XVI).
Rhopala *Ilex*
Clethra lævigata *Prunus sphærocarpa*
Drimys winteri *Leandra vesiculosa*

A fact worthy of note is that many species of orchids occur above 6500 ft. altitude. *Octomeria robusta* and *Zygopetalum mackayi* have been taken at almost 8000 ft. (Porto, 1915). Further observations on the flora of the mountain are incorporated with the descriptions of collecting stations.

LIFE-ZONES AND THEIR BIRDS

Three life-zones are represented upon the Serra do Itatiaya—the Tropical, Subtropical, and Temperate. Inasmuch as each is approximately coextensive with one of the three plant regions, their delimitation is relatively easy; and, in the main, the same boundaries that have just been drawn for the plant regions will serve for the life-zones.

But when an attempt is made to allocate the bird forms to their respective zones, difficulties immediately arise. Were Itatiaya considered alone, irrespective of any other part of the range of a given species, the allocation would be extremely simple, for the great bulk of Itatiaya forms distribute themselves within rather well-defined altitudinal belts. But there is not one species that is confined exclusively to Itatiaya. Therefore the extralimital ranges can not be ignored; yet to harmonize them with zonal distribution on Itatiaya is indeed a problem.

In the first place, the geographical ranges of the birds of southeastern Brazil are in no small measure unknown quantities. There are, of course, occasional forms whose areal distribution has been worked out in recent revisions with a fair degree of approximation, but such are exceptional, and ornithological work in Brazil has been neither extensive nor intensive enough for any statement of range to be much more than an estimate. For the birds under consideration, by far, most of the data on distribution are to be found in the Ihering's catalogue, '*As Aves do Brazil*,' 1907. Some of these have been revised in the volumes of '*Birds of the Americas*' (Field Museum Zoölogical Series, XIII); and, as just stated, some data are to be obtained from recent papers on certain restricted groups. But the best statements of range are usually in very general terms and are meaningless for zonal purposes. A bird occurring in the States of Minas Geraes, Espirito Santo, and Rio de Janeiro, for instance, could be confined to either Tropical, Subtropical, or Temperate Zone, or range unrestricted through all three. And even definite localities often mean but little more. For example, Ubatuba, São Paulo, is a small Atlantic port frequently cited by the Iherings. But only the collector himself could say whether specimens so labeled were taken in tropical bush at sea-level, or in dense forest 3000 to 5000 feet higher on the precipitous mountains that rise immediately behind the town.

Secondly, geographic distribution, in the modern sense, is a new study in South America. Dr. Chapman was the first ornithologist to apply the life-zone concept to any region of this continent, and until the appearance in 1917 of his masterly work, '*The Distribution of Bird-life in Colombia*,' there was nothing whatever in print regarding South American life-zones as applied to birds. Since then the only increments have been Dr. Chapman's '*Distribution of Bird-Life in the Urubamba Valley of Peru*' (Bull. 117, U. S. National Museum, 1921); Messrs. Todd and Carriker's '*Birds of the Santa Marta Region of Colombia*' (Annals Carnegie Museum, XIV, 1922); Messrs. Lönnberg and Rendahl's '*A Contribution to the Ornithology of Ecuador*' (Arkiv för Zoologi, Band 14, No. 25, 1922); Mr. Peters' '*Notes on Some Summer Birds of Northern Patagonia*' (Bull. Museum of Comparative Zoölogy, LXV, 9, 1923; a short paper on northeastern Venezuela (American Museum Novitates, No. 191, 1925), also from the pen of Dr. Chapman; Dr. Wetmore's '*Observations on the Birds of Argentina, Paraguay, Uruguay, and Chile*' (Bull. 133, U. S. National Museum, 1926); and Dr. Chapman's last and even more profound treatise, '*The Distribution of Bird-Life in Ecuador*' (Bull. Amer. Mus. Nat. Hist., LV, 1926).

Thus it is seen that, so far as its life-zones are concerned, Brazil is truly *terra incognita*. Because of this condition it is desirable to make at least a beginning towards the establishment of the zones; but, without bench mark or base line, so to speak, the task is difficult. Notwithstanding the lack of definite data, a great deal of time and thought has been given to the proper zonal allocation of Itatiaya species, and it is believed that the results are as nearly accurate as existing information will permit. It must be remembered, however, that at best they are but approximations.

In the lists that follow, each species has been assigned to that life-zone in which it attains its greatest abundance, or in which lies the greater part of its range. However, some birds, like some humans, are born nonconformists and will not abide by any set of rules. They are the species which seem as much at home in one zone as in another, and which, incidentally, bring down upon one's poor head the wrath of the life-zone critics.¹ Forty-two of the 187 Itatiaya forms fall in this category and make up 22.4 per cent of the recorded avifauna of the region. They are designated in the subjoined list.

Birds Ranging in All Three Zones

<i>Rhynchotus rufescens rufescens</i>	<i>Soroplex campestris campestris</i>
<i>Nothura maculosa maculosa</i>	<i>Phlaeocastes robustus robustus</i>
<i>Cariama cristata</i>	<i>Thamnophilus caerulescens caerulescens</i>
<i>Coragyps atratus brasiliensis</i>	<i>Rhopochares ruficapillus</i>
<i>Cathartes aura</i> subsp.	<i>Lochmias nematura nematura</i>
<i>Accipiter erythronemius erythronemius</i>	<i>Siptornis pallida</i>
<i>Cerchneis sparverius cinnamomina</i>	<i>Xenicopsis rufo-superciliatus</i>
<i>Petasophora serrirostris</i>	<i>Sittasomus sylviellus sylviellus</i>
<i>Leucochloris albicollis albicollis</i>	<i>Tænioptera cinerea cinerea</i>
<i>Guirra guirra</i>	<i>Knipolegus comatus</i>

¹"Those who have employed this zone system have either refrained from any discussion of its good and bad characteristics, or else they have merely taken the standpoint of advocates."—Livingston and Shreve in 'The Distribution of Vegetation in the United States, as Related to Climatic Conditions' (Pub. 284, Carnegie Institution of Washington, 1921, p. 528). Such a statement by the authors of the most exhaustive work in existence on the distributional controls of plants seems to demand a few general remarks not specifically required by the Itatiaya problem.

The materials of which life-zones are constructed are living organisms; the plumb and line, climatic conditions. And when dealing with living animals it must be remembered that their behavior can not be reduced to mathematical formulae. The old adage might well be rendered "while there is life there is variability." Hence there are certain to be exceptions to any scheme for systematizing geographical distribution. This is especially true of birds—the most mobile of all organisms. Life-zones should not be pictured as bird cages, nor even as aviaries, with definite, inelastic walls beyond which a species can not pass; for, as has just been shown, many species can and do disregard zonal boundaries. But, as Dr. Chapman has well said ('Distribution of Bird-Life in Colombia,' p. 84), "... a surprisingly large number of species are found in only one zone. The zones themselves are not, of course, more sharply defined than the ranges of the species which characterize them." The limits of life-zones, then, are not hard and fast lines, and no doubt the failure to keep this fact in mind has been the cause of much of the criticism of life-zone practice. But, notwithstanding their defects, life zones afford the readiest means yet devised to express geographical and, especially, altitudinal distribution, and the species not amenable to zonal classification are not sufficiently numerous to vitiate the system.

To make use of Merriam's theory, as do Livingston and Shreve, and then object to it (*op. cit.*, p. 244) because of Merriam's terminology savors of caviling. So long as Merriam's tenets are sound and his nomenclature is consistently applied, the actual names he has bestowed upon his various zones would seem of no consequence whatever.

Birds Ranging in All Three Zones (Continued)

<i>Phylloscartes ventralis ventralis</i>	<i>Cyclarhis ochrocephala ochrocephala</i>
<i>Serpophaga subcristata</i>	<i>Compsothlypis pitiayumi pitiayumi</i>
<i>Elania mesoleuca</i>	<i>Sporophila caerulescens</i>
<i>Elania obscura obscura</i>	<i>Spinus ictericus ictericus</i>
<i>Pitangus sulphuratus maximiliani</i>	<i>Myospiza itumeralis manimbe</i>
<i>Myiophobus fasciatus flammiceps</i>	<i>Brachyspiza capensis subsp.</i>
<i>Myiarchus ferox swainsoni</i>	<i>Donacospiza albifrons</i>
<i>Tyrannus melancholicus melancholicus</i>	<i>Emberizoides herbicola herbicola</i>
<i>Planesticus rufiventer rufiventer</i>	<i>Pipraeidea melanonota melanonota</i>
<i>Planesticus amaurochalinus</i>	<i>Thraupis cyanoptera</i>
<i>Vireosylva chivi chivi</i>	<i>Molothrus bonariensis bonariensis</i>

TROPICAL ZONE.—The Tropical Zone embraces all of the Foothill Region and, because of the removal of the forest, pushes up into the Monte Serrat basin to an altitude of about 3000 ft., forming a pocket well within the Subtropical Zone. In this pocket the upward range of many of the accompanying species is sharply arrested. (Cf. Bemfica and Monte Serrat, under Collecting Stations, and Pl. VIII and fig. 1 of Pl. IX.)

Birds of the Tropical Zone

(An asterisk indicates that the form occurs also in the Subtropical Zone.)

* <i>Crypturus tataupa tataupa</i>	* <i>Picumnus cirrhatus cirrhatus</i>
* <i>Pipile jacutinga</i>	* <i>Terenura maculata</i>
* <i>Odontophorus capueira</i>	* <i>Pyriglena leucoptera</i>
* <i>Chamæpelia talpacoti</i>	<i>Myrmoderus loricatus</i>
* <i>Milvago chimachima chimachima</i>	<i>Furnarius rufus badius</i>
* <i>Micrastur ruficollis</i>	* <i>Synallaxis ruficapilla</i>
* <i>Rupornis leucorrhoa</i>	* <i>Synallaxis cinnamomea russeola</i>
* <i>Elanoides forficatus yetapa</i>	* <i>Philydor rufus</i>
* <i>Ciccaba hylophilum</i>	* <i>Lepidocolaptes fuscus fuscus</i>
* <i>Glaucidium brasilianum brasilianum</i>	* <i>Colonia colonus colonus</i>
<i>Psittacula vivida vivida</i>	* <i>Platytriccus mystaceus</i>
* <i>Streptoprocne zonaris zonaris</i>	* <i>Rhynchocyclus sulphureus</i>
* <i>Cypseloides fumigatus</i>	<i>sulphureus</i>
<i>Phæthornis pretrei</i>	* <i>Todirostrum poliocephalum</i>
* <i>Melanotrochilus fuscus</i>	* <i>Euscarthmus nikipendulus subsp.</i>
* <i>Chlorostilbon aureoventris pucherani</i>	* <i>Myiodynastes solitarius solitarius</i>
* <i>Thalurania glaucopis</i>	<i>Megarhynchus pitangua pitangua</i>
* <i>Calliphlox amethystina</i>	* <i>Hirundinea bellicosa bellicosa</i>
<i>Trogonurus aurantius</i>	* <i>Empidonax euleri euleri</i>
* <i>Crotophaga ani</i>	* <i>Myiochanes cinereus</i>
<i>Ramphastos ariel</i>	* <i>Empidonomus varius varius</i>
* <i>Selenidera maculirostris</i>	* <i>Manacus manacus gutturosus</i>
<i>Malacoptila torquata torquata</i>	* <i>Neopelma aurifrons</i>

Birds of the Tropical Zone (Continued)

- | | |
|---|---------------------------------------|
| * <i>Tityra brasiliensis</i> | * <i>Cæreba chloropyga chloropyga</i> |
| * <i>Pachyrhampus polychropterus polychropterus</i> | * <i>Dacnis cayana paraguayensis</i> |
| * <i>Attila griseigularis</i> | * <i>Tersina cærulea cærulea</i> |
| * <i>Stelgidopteryx ruficollis ruficollis</i> | <i>Tangara cyaneiventris</i> |
| <i>Troglodytes musculus musculus</i> | <i>Tangara flava chloroptera</i> |
| <i>Planesticus albiventer albiventer</i> | * <i>Thraupis sayaca</i> |
| * <i>Geothlypis æquinoctialis cucullata</i> | * <i>Thraupis ornata</i> |
| * <i>Basileuterus auricapillus auricapillus</i> | * <i>Piranga saira saira</i> |
| * <i>Cyanocompsa cyanea cyanea</i> | * <i>Tachyphonus coronatus</i> |
| * <i>Oryzoborus angolensis angolensis</i> | * <i>Pyrrhocomma ruficeps</i> |
| * <i>Pitylus fuliginosus</i> | * <i>Schistochlamys capistrata</i> |
| * <i>Saltator similis similis</i> | <i>Ostinops decumanus decumanus</i> |
| <i>Sicalis flaveola holti</i> | * <i>Cacicus hæmorrhous aphanes</i> |

SUBTROPICAL ZONE.—This is a zone of tall trees, which, with the exception noted under the Tropical Zone, includes the whole of the Forest Region. Its altitudinal extent is roughly from 3000 to 6000 ft., with irregular limits above and below. Here bird-life attains its maximum abundance on Itatiaya. (Cf. Ponte Maromba and Macieiras, under Collecting Stations, Pl. IX, fig. 2, and Pl. X.)¹

Birds of the Subtropical Zone

(A single asterisk indicates that the form occurs also in the Tropical Zone; double asterisks, in the Temperate Zone.)

- | | |
|---|--|
| * <i>Crypturus obsoletus obsoletus</i> | * <i>Tripsurus flavifrons</i> |
| <i>Penelope obscura bronzina</i> | ** <i>Veniliornis spilogaster</i> |
| * <i>Columba plumbea plumbea</i> | <i>Scytalopus indigoticus</i> |
| <i>Leptotila reichenbachii</i> | * <i>Conopophaga lineata</i> |
| <i>Eupsittula auricapilla aurifrons</i> | <i>Batara cinerea cinerea</i> |
| <i>Pyrrhura vittata vittata</i> | <i>Mackenziaena leachii</i> |
| * <i>Pionus maximiliani maximiliani</i> | <i>Mackenziaena severa</i> |
| * <i>Pionopsitta pileata</i> | * <i>Dysithamnus mentalis mentalis</i> |
| <i>Macropsalis forcipata</i> | <i>Dysithamnus xanthopterus</i> |
| ** <i>Phæthornis squalidus</i> | * <i>Drymophila ferruginea</i> |
| <i>Piaya cyana macroura</i> | <i>Drymophila ochropyga</i> |
| <i>Ramphastos discolorus</i> | ** <i>Drymophila genei</i> |
| <i>Bailloni bailloni</i> | ** <i>Chamæza ruficauda ruficauda</i> |
| <i>Chloronerpes aurulentus</i> | <i>Grallaria varia imperator</i> |
| <i>Chrysomitris melanochloros melanochloros</i> | * <i>Synallaxis spixi spixi</i> |
| | <i>Heliobletus superciliosus</i> |

¹From his work in Colombia Dr. Chapman concludes (1917, Bull. American Museum of Natural History, XXXVI, pp. 92 and 139) that the Subtropical Zone nowhere reaches sea-level. I doubt if this holds good for Brazil, for I believe that field work along the coast between the southern border of the State of São Paulo and the southern end of the Serra do Mar, in Rio Grande do Sul, would show that this zone meets the sea. My reason for the belief is the southward extension of heavy forest to a point beyond that which one could well expect the Tropical Zone to reach.

Birds of the Subtropical Zone (Continued)

- | | |
|--|--|
| <i>Anabazenops fuscus</i> | <i>Tijuca nigra</i> |
| * <i>Xiphocolaptes albicollis albicollis</i> | * <i>Pygochelidon cyanoleuca</i> |
| <i>Campylorhamphus falcularius</i> | * <i>Mimus saturninus frater</i> |
| * <i>Dendrocolaptes picumnus picumnus</i> | * <i>Platycichla flavipes flavipes</i> |
| ** <i>Knipolegus cyanirostris cristatus</i> | * <i>Planesticus albicollis albicollis</i> |
| <i>Muscipipra vetula</i> | <i>Pachysylvia pæcilotis</i> |
| * <i>Orchilus auricularis</i> | ** <i>Basileuterus leucoblepharus</i> |
| <i>Pogonotriccus eximius</i> | <i>Stelgidostomus maxillosum</i> |
| <i>Pipromorpha rufiventris</i> | ** <i>Poospiza lateralis</i> |
| <i>Phyllomyias brevirostris brevirostris</i> | <i>Tanager pectoralis</i> |
| * <i>Camptostoma obsoletum obsoletum</i> | <i>Tanager thoracica</i> |
| <i>Elania parvirostris parvirostris</i> | <i>Orthogonyx chloricterus</i> |
| <i>Myiobius ridgwayi</i> | <i>Trichothraupis melanops melanops</i> |
| <i>Chiroxiphia caudata</i> | * <i>Cissopis leveriana major</i> |
| * <i>Scotothorus unicolor</i> | ** <i>Archiphanes albirostris</i> |
| <i>Phibalura flavirostris</i> | |

TEMPERATE ZONE.—The ridges, broad slopes, and rocky peaks rising above an altitude of approximately 6000 ft. lie within the Temperate Zone, which is exactly coextensive with the Campo Region. While the principal floral feature is treeless grassland (*campo*), there are many copses of dwarf forest, often quite extensive; and on some slopes wide bands of woods, which are really continuous extensions of the Forest Region, reach up from the Subtropical Zone. In these forests the boundary between the Subtropical and Temperate Zones is very difficult to determine exactly, though at the lowest limits of *campo* it is sharply defined. This is a region of heavy rainfall, considerable fog, and low temperature. Bird-life is not abundant. (Cf. Macieiras and Alto Itatiaia, under Collecting Stations, and Pls. VI, VII, and XI-XIX.)

Birds of the Temperate Zone

(An asterisk indicates that the form occurs also in the Subtropical Zone.)

- | | |
|--------------------------------|--|
| * <i>Clytolæma rubricauda</i> | * <i>Guracava difficilis</i> |
| * <i>Stephanoxis lalandi</i> | * <i>Anthus hellmayri brasiliensis</i> |
| * <i>Scytalopus speluncæ</i> | <i>Poospiza thoracica</i> |
| <i>Synallaxis moreira</i> | * <i>Embernagra platensis</i> |
| * <i>Knipolegus nigerrimus</i> | * <i>Haplospiza unicolor</i> |
| <i>Hemitriccus obsoletus</i> | * <i>Stephanophorus diadematus</i> |

DISTRIBUTIONAL SUMMARY.—The zonal distribution of the birds of Itatiaia, as presented in the foregoing sections, may be summarized thus:

	Number of Species	Per Cent
Tropical Zone	71	38.0
Subtropical Zone	62	33.2
Temperate Zone	12	6.4
Of general distribution	42	22.4
Total	187	100.0

The apparently small number of Tropical Zone species represented, when compared with those of the Subtropical Zone, is due to the fact that by far the greater bulk of the Serra do Itatiaya is raised above the Tropical Zone. Had I collected in the tropical valley of the Rio Parahyba there is no doubt that the list of Tropical Zone species would have been considerably augmented.

ALTITUDINAL RANGES OF CHARACTERISTIC ITATIAYA BIRDS.—In the preceding lists the zonal allocations are based on the extralimital ranges of the species concerned, or are compromises between the allocations indicated by these extralimital ranges and those indicated by the zonal distribution on Itatiaya. A great deal of personal equation is an unavoidable concomitant of these adjustments. In order that other workers may have a ready check on these allocations, and that any discrepancies between the Itatiaya and the extralimital zonal distribution may be at once apparent, I have compiled another list in which the species are considered as Itatiaya birds only. This list, immediately following, comprises 90 species, more or less common, selected because they were found in only one zone or else were more abundant in a particular zone than in any other.

Characteristic Birds of the Serra do Itatiaya

Species	Altitude	Zone
<i>Crypturus obsoletus obsoletus</i>	2500-6800	Subt.
<i>Rhynchotus rufescens rufescens</i>	6500-7500	Temp.
<i>Penelope obscura bronzinga</i>	3700-6600	Subt.
<i>Columba plumbea plumbea</i>	2700-6900	"
<i>Chamaepelia talpacoti</i>	1700	Trop.
<i>Glaucidium brasilianum brasilianum</i>	2500-3800	Subt.
<i>Pyrrhura vittata vittata</i>	2700-7200	"
<i>Psittacula virida virida</i>	1700-2700	Trop.
<i>Pionus maximiliani maximiliani</i>	5200-5500	Subt.
<i>Pionopsitta pileata</i>	3800	"
<i>Macropsalis forcipata</i>	6100	"
<i>Streptoprocne zonaris zonaris</i>	2700-7200	"
<i>Cypseloides fumigatus</i>	2700	Trop.
<i>Phaethornis squalidus</i>	3000-7400	Subt.

Characteristic Birds of the Serra do Itatiaya (*Continued*)

Species	Altitude	Zone
<i>Melanotrochilus fuscus</i>	2700	Trop.
<i>Petasophora serrirostris</i>	6800	Temp.
<i>Clytolæma rubricauda</i>	3800-7900	"
<i>Stephanoxis lalandi</i>	3800-8100	"
<i>Trogonurus aurantius</i>	3000	Trop.
<i>Piaya cayana macroura</i>	3000-5200	Subt.
<i>Crotophaga ani</i>	1600-2700	Trop.
<i>Guira guira</i>	1600	"
<i>Ramphastos discolorus</i>	3400-3800	Subt.
<i>Bailloniuss bailloni</i>	3700	"
<i>Soroplex campestris campestris</i>	6800-7200	Temp.
<i>Chrysophilus melanochloros melanochloros</i>	3500-3800	Subt.
<i>Tripsurus flavifrons</i>	2500-5900	"
<i>Veniliornis spilogaster</i>	2700-7100	"
<i>Scytalopus speluncæ</i>	3700-8000	Temp.
<i>Conopophaga lineata</i>	3000-6900	Subt.
<i>Batara cinerea cinerea</i>	3600	"
<i>Mackenziana leachii</i>	4800-6200	"
<i>Dysithamnus xanthopterus</i>	5200-6100	"
<i>Drymophila ferruginea</i>	2900-5500	"
<i>Drymophila ochropyga</i>	2900-3800	"
<i>Drymophila genei</i>	3800-7500	"
<i>Pyriglena leucoptera</i>	3100-3800	"
<i>Chamaeza ruficauda ruficauda</i>	3800-7200	"
<i>Grallaria varia imperator</i>	3700-6100	"
<i>Furnarius rufus badius</i>	1600-2700	Trop.
<i>Lochmias nematura nematura</i>	2800-6700	Subt.
<i>Synallaxis ruficapilla</i>	2900-5100	"
<i>Synallaxis spizi spizi</i>	1600-3800	Trop.
<i>Synallaxis moreiræ</i>	6500-8500	Temp.
<i>Xenicopsis rufo-superciliatus</i>	3800-7100	Subt.
<i>Anabazenops fuscus</i>	2700-3600	"
<i>Xiphocolaptes albicollis albicollis</i>	3600-5100	"
<i>Dendrocolaptes picumnus picumnus</i>	3000-3900	"
<i>Knipolegus nigerrimus</i>	3800-8300	Temp.
<i>Knipolegus cyanirostris cristatus</i>	3700-7100	Subt.
<i>Colonia colonus colonus</i>	3800	"
<i>Todirostrum poliocephalum</i>	2700-3000	Trop.
<i>Orchilus auricularis</i>	3000-3800	Subt.
<i>Hemitriccus obsoletus</i>	5800-7500	Temp.
<i>Guiracava difficilis</i>	5900-7200	"
<i>Phylloscartes ventralis ventralis</i>	5200-8000	"
<i>Pipromorpha rufiventris</i>	3100-6100	Subt.
<i>Elania parvirostris parvirostris</i>	3800-6100	"
<i>Elania mesoleuca</i>	5900-7200	Temp.
<i>Pitangus sulphuratus maximiliani</i>	1500-3800	Trop.

Characteristic Birds of the Serra do Itatiaya (*Continued*)

Species	Altitude	Zone
<i>Empidonax euleri euleri</i>	3000-6100	Subt.
<i>Chiroxiphia caudata</i>	3000-3400	"
<i>Phibalura flavirostris</i>	2700-3800	"
<i>Tijuca nigra</i>	3800-6800	"
<i>Troglodytes musculus musculus</i>	1500-2700	Trop.
<i>Mimus saturninus frater</i>	1600	"
<i>Platycichla flavipes flavipes</i>	2700-5900	Subt.
<i>Planesticus albicollis albicollis</i>	5900-6100	"
<i>Basileuterus auricapillus auricapillus</i>	2000-6100	"
<i>Basileuterus leucoblepharus</i>	5800-7200	Temp.
<i>Anthus hellmayri brasiliensis</i>	7100-8000	"
<i>Cyanocopsa cyanea cyanea</i>	1600-3000	Trop.
<i>Oryzoborus angolensis angolensis</i>	1600	"
<i>Sporophila caerulescens</i>	1600-2700	"
<i>Stelgidostomus maxillosus</i>	5300-7100	Subt.
<i>Sicalis flaveola holti</i>	1600-2700	Trop.
<i>Poospiza thoracica</i>	5600-7200	Temp.
<i>Poospiza lateralis</i>	3800-8000	Subt.
<i>Emberizoides herbicola herbicola</i>	1600	Trop.
<i>Haplospiza unicolor</i>	5600-7200	Temp.
<i>Careba chloropyga chloropyga</i>	1600-3200	Trop.
<i>Tangara thoracica</i>	2700-5700	Subt.
<i>Stephanophorus diadematus</i>	3000-7900	Temp.
<i>Thraupis sayaca</i>	2700	Trop.
<i>Thraupis ornata</i>	2700-5700	Subt.
<i>Trichothraupis melanops melanops</i>	3200-3800	"
<i>Cissopis leveriana major</i>	3000-3800	"
<i>Schistochlamys capistrata</i>	1600-2700	Trop.
<i>Archiplanus albirostris</i>	3800-5800	Subt.
<i>Cacicus haemorrhous aphanes</i>	3000-3200	"

COLLECTING STATIONS

The only two trails now in use on Itatiaya enter the *serra* by way of the cañons of the Rio Preto and Rio Campo Bello. The latter route, being by far the more accessible, is that which has been followed by every scientist who has visited the region. The same circumstance of accessibility determined the field of my labors; therefore, except at the summit, my studies were devoted to the area (lying entirely within the State of Rio de Janeiro) drained by the Rio Campo Bello, which tumbles down the mountain in a southeasterly direction.

Though confined so largely to the southern face of the *serra*, my observations embrace the entire altitudinal extent of the mountain from its base at 1400 ft., in the valley of the Parahyba, to its culminating point

in the Agulhas Negras, almost 9200 ft. above the sea. The better to cover this range of altitude my studies were conducted from five different stations, descriptions of which follow.

BEMFICA (Alt. 1500–2000 ft.; Tropical Zone; Pl. VIII, fig. 1).—This is a settlement of wealthy people of Rio de Janeiro and São Paulo who, finding here ideal locations for summer cottages, have taken over some of the abandoned lots of an immigrant colony which the federal government unsuccessfully tried to establish at this point and in the Monte Serrat basin above. The community is scattered over a basin of the Rio Campo Bello lying just within the outer gates of the *serra*. The elevation varies from 1500 ft., at the pass through which the river flows out into the Parahyba Valley, to about 2000 ft., at the foot of the rocky wall separating the Bemfica basin from the Monte Serrat basin. Almost without exception the little valleys are cleared of all forest, and the hill-sides are either cleared fields or pastures with occasional patches of woodland. Forest begins at about 2000 ft.

Here were found grass-loving birds not observed elsewhere on the mountain, even at Monte Serrat.

MONTE SERRAT (Alt. 2700 ft.; Tropical Zone; Pls. VIII, fig. 2, and IX, fig. 1).—Monte Serrat, the headquarters of the Reserva Florestal do Itatiaia and of the Itatiaia immigrant colony, occupies the southwestern extremity of a long, deforested ridge reaching down between two swift creeks to break abruptly as a bluff above the Rio Campo Bello. The altitude at the buildings is 2700 ft.—300 ft. higher than the river opposite. The slopes all around are cleared of timber and grown up thickly to high bushes, huge bracken, and herbaceous vegetation. Practically no forest occurs below 3000 ft. except a strip between Monte Serrat and Bemfica and a patch beginning at 2400 ft. on the right bank of the Campo Bello and ascending a steep ravine to the summit of the western wall of the basin (Pl. VIII, fig. 2). None of this is virgin.

This locality was for years the headquarters of a large *fazenda*, and much of the forest was then cut over for timber, but a great amount of clearing has been done by the government in its ill-advised attempt to establish here a colony of immigrants. The numerous abandoned houses up and down the river and hidden back in every ravine are eloquent of the failure of the scheme. The only result has been the devastation of the forest.

Monte Serrat is contained within a second basin of the Rio Campo Bello, larger and rougher than the Bemfica basin, and separated from the latter by a rocky wall or dike through which the river has cut a

narrow pass. The lowest altitude within the Monte Serrat basin is about 2300 ft. Topographically this basin extends upward along the river to 3600 ft. where, at the Ponte Maromba, it is cut off from the cañon of the Campo Bello by another dike, but that portion of it rising above 3000 ft. lies within the Subtropical Zone and is considered under the next station.

PONTE MAROMBA (Alt. 3800 ft.; Subtropical Zone; Pls. IX, fig. 2, and X).—My camp near the Ponte Maromba was in an unoccupied colonist's house on Lote 41 at 3800 ft. altitude. This lot, now in an advanced stage of reversion, is situated on a general southeast slope, the river here flowing almost due south.

The entire region from the Ponte Maromba (3588 ft.) up the main trail to 5000 ft. is either reverted clearing or burn. The former is characterized by a low ground-cover of bushes and small trees, blanketed with a dense mat of vines through which a scattered stand of first-growth trees lift their crowns high above the general level of vegetation. The burns are mostly treeless slopes grown up to an almost impenetrable tangle of *samambaia* (an enormous species of bracken).

In the old clearings the tall trees are the particular haunts of such species as *Bailloni* *bailloni*, *Ramphastos discolorus*, *Colonia c. colonus*, *Platycichla f. flavipes*, *Xiphocolaptes a. albicollis*, *Dendrocolaptes p. picumnus*, tanagers, and woodpeckers. The undergrowth harbors various species of *Thamnophilus* and allied genera, *Drymophila*, *Synallaxis*, *Batara*, and others. Between 3200 and 3700 ft., on the trail that follows above the right bank of the river, the clearings are largely grown up to *taquarassú* (giant bamboo). This seems to be the favorite haunt of *Anabazenops fuscus*.

Below the Ponte Maromba (3588 ft.) the main trail, with many turns in and out of side ravines, descends at an easy grade high above the left bank of the river. The region traversed is entirely reverted clearing until open fields are reached just above Monte Serrat.

The Ponte Maromba spans the river¹ at the point where a dike of rock, burned clean of forest and covered with *samambaia*, juts out from the left wall of the cañon to meet the broad bulk of the right. Immediately below the bridge the cañon widens out to form the Monte Serrat basin; above, it is almost a gorge. On the steep sides of this deep narrow cañon above the bridge is found the only virgin forest on the mountain.

¹From this bridge up to Alto Itatiaya the river is known as the Rio Maromba. Rio Bemfica, Rio Monte Serrat, Lago Azul, Rio Maromba, and Ribeirão das Flores are merely names applied to different reaches of the same Rio Campo Bello.

This forest, though as indescribable in its profusion of orchids, bromeliads and other epiphytes, ferns, mossy trunks, and multiplicity of plant forms as a subtropical forest always is, is not remarkable for the size nor height of its trees. The undergrowth is choked with a small species of cane or bamboo, which, being very difficult to cut because of its flinty nature and pliability, renders progress slow and trying.

But heavy timber is not favored by the feathered folk and is always quiet. During about three hours in this virgin forest one morning I saw a lone thrush and heard only a *Scytalopus speluncæ*, a *Lochmias n. nematura*, a *Penelope obscura bronzina*, and two or three other birds. On another occasion my observations in the same stretch of forest netted merely four or five *Baillonius bailloni*, a *Chloronerpes aurulentes*, a *Lochmias n. nematura*, and a woodhewer.

On the other hand, reverted clearings seem to be preferred by both insects and birds and are the best situations in which to find species as well as individuals in the greatest abundance. Those about Lote 41 fairly teem with birds, but a worse collecting ground could not be imagined. A bird shot is by no means a specimen collected. After cutting to the spot where the bird was seen to fall one may spend fifteen or twenty minutes searching through the dense tangle of vines and litter of rotting plant stems enveloping the ground, only to retrace his steps over fallen logs and loose, ragged boulders empty-handed.

MACIEIRAS (Alt. 6100 ft.; border between Subtropical and Temperate Zones; Pl. XI, fig. 1).—Years ago an enterprising son of the Visconde de Mauá conceived the idea of growing, almost within sight of the nation's capital, fruits commonly imported from other continents, and to this end had several acres high upon the side of Itatiaia cleared of the low forest growth, and in its stead planted apple, pear, plum, and prune trees. Hence the spot became known as Macieiras (sometimes Macieiras de Baixo), the Portuguese for apple trees. Later, when the mountain passed into the hands of the government, the Reserva Florestal constructed here a hut of mud-and-wattle for the use of the trail workers. This cabin, situated at an altitude of 6100 ft., I found admirably adapted to my needs as a station from which to study the borderland between the Subtropical and Temperate Zones, and the surrounding orchard rendered much more tolerable my rough camp fare by supplementing it with an unlimited supply of delicious apple and pear sauce. The trees still bear nobly, though they are surely succumbing to the relentless attacks of mosses and fungi.

Below the cabin the trail passes from the orchard into subtropical forest, which sweeps without a break up the main cañon from the Ponte

Maromba. This forest is rather low at Macieiras, but becomes progressively more vigorous as one descends the mountain. Its upper portion is somber and silent and, more frequently enveloped in cloud-fog, oppresses one with a sense of loneliness not felt in the sunnier forest at lesser altitudes. Between 5000 and 6000 ft. the graceful *crissiuma* bamboo (*Arthrostylidium* sp.) attains its highest development and fills every interstice between the trees with a dense, well-nigh impenetrable mat of feathery leaves and drooping stems. This tangle is the habitat of *Scytalopus speluncæ*, *Conopophaga lineata*, *Drymophila genei*, *Chamaeza r. ruficauda*, *Hemitriccus obsoletus* and *Guracava difficilis*.

Almost immediately above Macieiras the forest growth stops on this slope, and the trail emerges upon bunch-grass *campo* which is continuous with that about the meteorological station a few hundred feet above and can be considered a part of Alto Itatiaya.

ALTO ITATIAYA (Alt. 7150 ft.; Temperate Zone; Pls. XII to XIX).—This locality has ever been the principal focus of interest for all scientists visiting Itatiaya, and, fortunately for their researches, some kind of habitation has existed here for half a century. The first structure, erected by one of the early cattlemen, Francisco Ramos de Paula, for the use of his herders, was called the Casa da Invernada (Winter House). Later the name was changed to Retiro do Ramos in honor of the old *fazendeiro*, and the locality is so designated in most of the scientific papers dealing with the region, but, because a few weather-beaten apple trees about the house still defy the blasts and the fungi, some writers employ the name Macieiras de Cima. Since the tenure of the government, however, the entire *planalto* has become known as Alta Itatiaya.

In 1914 a modern meteorological station was established here, about a league south of the Agulhas Negras, and the old *retiro* has been remodeled as a residence for the observer. This box-like house, standing alone amidst wide windswept spaces at an altitude of 7150 ft., is the most elevated human habitation in all Brazil. Through the courtesy of the observer, Dona Rosalina de Freitas, its roof was my shelter during the weeks of rain while I investigated the bird-life of the heights.

Before the house open bunch-grass *campo*, interrupted here and there by patches of dwarf forest, extends northward to the summit of a high rocky ridge crowned by the peaks Prateleiras and Pedra Assentada (see Pl. XII; the white spot on the hill at the left is the meteorological station). In the open gap between the peaks (about 8000 ft. alt.) the ground is covered to the depth of a foot or more with sphagnum.

Beyond this ridge lies the headwaters basin of the Rio Campo Bello, on the farther side of which the Agulhas Negras, the dominating feature

and central point of the entire *planalto*, rear their naked towers skyward. This elevated valley is barren and desolate almost beyond description and may be likened to a vast amphitheater whose stone benches and columns have been shattered by some titanic force into a myriad bits. Among the innumerable boulders strewn everywhere over its broken surface wiry grasses, herbs, and occasional bushes find a precarious existence, and here dwarf forest is further reduced to stunted copses struggling upward along the small streams. The highest slopes are simply wastes of rock, mitigated only by the soft green of grasses. It was this wild chaos of broken rock that inspired the Tupi tribesmen to name the mountain in poetic fancy, Itatiaya—Multiplying Rock.

In the midst of this desolation the eye is irresistibly drawn to the Vargem das Flores, a few level acres on the floor of the valley (about 7400 ft. alt.) covered with an emerald carpet in which the blossoms of a rank growth of *Eupatorium* sp. and *Erigeron maximus* sparkle like countless white stars.

About the north and east bases of the Agulhas Negras the Vargem do Ayuruoca and the Retiro do Rio Preto form a wide crescent of peaceful green. These high, boggy meadows of *Xyris* are the most extensive level areas on the *planalto*, and, together with the grassy slopes confining them, furnish excellent pasturage for herds of cattle that range up from the Minas Geraes side of the mountain.

Passing southward from the meteorological station one descends from the *planalto* through dwarf forest to twin hills, the Morro dos Carneiros and the Morro Redondo, both mentioned by Ribeiro (1905). Forest extends down through the pass between them, but their sides and summits are open *campo* dotted with a few scattered bushes. Morro Redondo (alt. 6875 ft.) is the type locality of Ribeiro's *Synallaxis moreiræ*.

Another locality mentioned frequently by Ribeiro is the Caminho do Couto. This is an old trail, long fallen into disuse, that descends from the meteorological station westward down the cañon of the Rio Itatiaya. The Bengalal do Couto was a thick stand of *bengala* bamboo (*Chusquea*) that once grew at about 6500 ft. on this trail, but, as the bamboo has disappeared from that particular place, the Bengalal do Couto now exists only in print.

The distribution of forest at Alto Itatiaya is so erratic that it is almost impossible to define its average upper limit. An unbroken mantle, dwarfed of course in its upper portion, stretches up the southwestern slope of the Pedra do Couto from Subtropical Zone to an altitude of 8100 ft.—almost the summit of the ridge. But the opposite side of

this ridge forms the southwestern wall of the Campo Bello amphitheater and is devoid of even a copse. On the side of the Agulhas Negras a patch of miserable dwarf forest climbs up among gigantic boulders until at 8000 ft. it gives way to small bushes and dwarfed *bengala* (*Chusquea pinifolia*) that ascend in crevices to the summit. The very highest forest outpost, however, is a copse that reaches up a crevice to 8500 ft., though in the cleft leading to the summit a few stunted trees find a foothold more than a hundred feet higher.

The facts that detached copses most often occupy depressions or portions of ravines and that the crests of ridges are nearly always bare might lead to the conclusion that ground-water is a controlling factor in forest distribution. But this does not explain the occurrence of a given type of forest at a certain altitude on one slope and at a very different level or entirely absent on the slope opposite, either of the same ridge or of two different ridges. A case in point is the hill of the Macieiras do Meio. On its southwestern slope typical dwarf forest extends to the very summit at 7300 ft. and there stops short; over the crest the hill drops away 1200 ft. to the bottom of the Campo Bello Cañon with hardly a copse to break the clean sweep of grass. (In February this slope blazed with the rich purplish-pink blossoms of *Chætostoma glaziovii*.) Neither does the ground-water theory explain the occurrence of separate patches of forest of the same type on the same slope, one above the other, with only grass between. Fire has certainly played a part in forest distribution, for its destructive effects are evident throughout the region, and doubtless there are factors of soil not manifest on the surface; but the final solution of the problem does not lie within the field of the ornithologist.

The dwarf forests are composed of small, gnarled trees burdened with masses of parasites and epiphytes of every conceivable form. The bark of the older boles is often completely hidden by mosses, lichens, fungi, and ferns, while every nook beneath the twisted branches is usually filled with a tangled growth of two or three species of bamboo belonging to the genera *Chusquea* and *Arthrostyidium* (Pl. XIV). Stout climbing vines of *Fuchsia integrifolia* sometimes compete with the bamboo, and about the edges of the copses the fragrant white flowers of *Symphyopappus* are conspicuous.

The dominant plants of the open *campos*, which begin at about 6000 ft., are two species of *cabeça de negro* (*Xyris*), but among their tussocks spring up a host of beautiful and varied wild flowers. Prominent among them are the white heads of *Pæpalanthus polyanthus*, the purple *Utricularia reniformis*, *Alophia sellowiana* of palest blue, and the yellow and

scarlet bico de tucano (*Syphocampylos westinianus*). Dotted over certain parts of the *campo* are bushes of *alecrim do campo* (*Baccharis discolor*)—known only from Itatiaya.

Compared with lower altitudes, birds are not abundant at Alto Itatiaya. The dominant species is *Synallaxis moreiræ*, which lives chiefly about the margins of copses, while the commonest bird within them is *Elænia mesoleuca*. The depths of the bamboo undergrowth harbor *Scytalopus speluncæ*, *Drymophila genei*, *Hemitriccus obsoletus*, *Guracava difficilis*, and *Basileuterus leucoblepharus*, while only *Rhynchotus r. rufescens* and *Anthus hellmayri brasiliensis* are confined strictly to the grass of the *campos*. Other conspicuous species are *Stephanoxis lalandi*, *Knipolegus nigerrimus*, *Poospiza thoracica*, *Poospiza lateralis*, and *Stephanophorus diadematus*. *Stephanoxis lalandi*, *Synallaxis moreiræ*, *Knipolegus nigerrimus*, and *Brachypiza capensis* range higher than any other birds except hawks and vultures, and seem content even in the chaotic rocky wastes about the final peaks.

Numerous ponds, rain pools, occupy depressions at various levels, even on the summits of such high ridges as that connecting Prateleiras and the Pedra do Couto, where they were found at 8000 ft., but though one of these has yielded an abundance of a peculiar species of amphipod (*Allorchestes pernix*; cf. Moreira, 1903b) no sign of shorebirds or waterfowl was discovered.

It is an interesting fact that the bird specimens taken at Alto Itatiaya were commonly infested with ticks (*Ixodes auritulus*), while those secured at Monte Serrat were not so parasitized.

PREVIOUS WORK

Itatiaya has long interested the scientist, and at various times has been the field of labor of geographer, geologist, botanist, and zoölogist. Many illustrious men have told of the beauties and wonders of this truly remarkable mountain. But even a résumé of the work done in such widely different branches of science is beyond the scope of this report, and attention will be confined to a discussion of the ornithological knowledge of the region prior to the present survey.

Among forty-two books and papers concerning Itatiaya, only six were found to contain specific references to birds. These are Carvalho (1900), Ihering and Ihering (1907), Lüderwaldt (1909), Moreira (1903a),

Ribeiro (1905), and Ule (1896).¹ Carvalho and Ule mention but a single species each, Moreira only four, and the Ihering's work, though listing the specimens collected by Lüderwaldt and describing *Guracava difficilis* from Itatiaya, is essentially a catalogue of birds of Brazil as a whole; so we are left to deal with only the works of Ribeiro and Lüderwaldt.

In 1905, Dr. Ribeiro, of the Museu Nacional do Rio de Janeiro, published a report on all vertebrates, excepting amphibians, collected on Itatiaya in 1901, 1902, and 1903 by Dr. Carlos Moreira, then an assistant in the same institution. This report lists specimens of 53 species of birds and includes notes made by Dr. Ribeiro himself on nine others which he observed during a short visit to the *serra* in November, 1904. In this list *Synallaxis moreiræ* and *Musciphaga obsoleta* are described as new.

Four years later Sr. Lüderwaldt, of the Museu Paulista, São Paulo, published the ornithological results of seven weeks' collecting at Alto Itatiaya during April and May, 1906, and, by including 61 of the species reported by Ribeiro, brought the ornithology of the mountain up to date with a list of 99 forms.

Unfortunately, of the 100 forms reported at the time I began my work, two were synonyms, one hypothetical, six erroneously identified, and ten indefinite. Thus there remained a list of only 81 species upon which to build. My own records (comprising 164 species) and five courteously supplied by Sr. Pedro Velho, of the Museu Nacional, raise to 187 the total number of species now definitely recorded from the Serra do Itatiaya.

ACKNOWLEDGMENTS

It is my desire to acknowledge here a debt of gratitude for much valuable assistance rendered by many persons during the prosecution of my studies.

First of all, thanks are due Dr. Pacheco Leão, Director of the Jardim Botânico do Rio de Janeiro, for permission to work in the Reserva Florestal do Itatiaya, which is under his administration; Dr. Paulo de

¹Since the completion of my manuscript two other bird papers have appeared in Vol. XXIV of the *Archivos do Museu Nacional do Rio de Janeiro*, 1923, viz.: Alípio de Miranda-Ribeiro, 'Nota Crítica sobre a Ornis do Itatiaya,' pp. 237-255, and Pedro Pinto Peixoto Velho, 'Avifauna da Serra do Itatiaya,' pp. 257-264.

The first contains no records not included in the author's previous paper (Ribeiro, 1905), except those resulting from Pedro Velho's two excursions to Itatiaya (May and June, 1921, and February, 1922), which are published by Velho himself. The new records, therefore, I am quoting from Velho's paper rather than from Ribeiro's. In fact, this new paper of Ribeiro's is mostly a discussion of the identifications in his paper of 1905, and apparently was directly induced by the fact that the Iherings (1907) did not accept some of these determinations. Therefore the occasions for me to refer to this paper in connection with the present survey are but few, and for this reason all references to Ribeiro in the Systematic List apply to his paper of 1905, unless specifically indicated to the contrary.

The records contained in Velho's paper are duly incorporated in the Systematic List.

Campos Porto, in direct charge of the Reserva, for placing at my disposal many facilities contributing to my personal comfort and the success of the expedition; and Dr. J. G. Kuhlmann, of the same institution, for identifying botanical specimens.

Dr. Affonso d'E. Taunay, Director of the Museu Paulista, and Dr. Bruno Lobo, ex-Director of the Museu Nacional do Rio de Janeiro, have extended many courtesies; Sr. Pedro Pinto Peixoto Vehlo, of the Museu Nacional, has most generously contributed several of his unpublished records¹; while Mr. Edward A. Chapin, of the United States Bureau of Animal Industry, has very kindly identified the bird parasites collected.

But especially am I indebted to Dr. Alipio de Miranda Ribeiro, distinguished zoölogist of the Museu Nacional, and to Sr. Jayme Cotrim, scientific agriculturist and *fazendeiro* of the old school. Dr. Ribeiro's spirit of kindly interest and unselfish cooperation has been manifested in many ways. Suffice it to say here that he gave of his time without stint to obtain official permission for me to collect on a government reservation, and but for his aid and sponsorship I might well have encountered considerable difficulty and delay. Sr. Cotrim's home at Campo Bello was mine without the asking, and to him was largely due the solution of my problems of transportation and communication.

It is also my pleasure to express my gratitude to those, too numerous for separate mention, who have helped me in a hundred ways—*camaradas*, camp men, hunters, and other natives, unfailingly courteous and ever ready to do some bit to advance scientific knowledge of their country. To live with and really know the people of a country is perhaps the greatest privilege of the field naturalist; and as I now look back upon many varied experiences on Itatiaya the memories of my neighbors there are wholly pleasurable.

Lastly, I wish to acknowledge my obligations to Dr. Frank M. Chapman, under whose direction the survey was undertaken; to Mr. Waldron DeWitt Miller, who has carefully revised my identifications; to Mr. W. E. Clyde Todd, for valuable counsel; and to my wife, who has been my mainstay in the consultation of Portuguese references and in the preparation of manuscript.

EXPLANATIONS

The higher classification and sequence of species herein adopted follow Brabourne and Chubb in 'The Birds of South America,' 1912.

For certainty of reference, scientific names used by Ribeiro, Lüderwaldt, and Pedro Velho are listed as synonyms whenever they differ to

¹These have since been published in his 'Avifauna da Serra do Itatiaya.' See Velho, 1923.

any extent from the names now generally accepted. It will be observed, however, that several names found in the text of the Systematic List are not true synonyms of the modern captions under which they appear. This is due to incorrect identification of some of the specimens reported by the authors cited. Through the courtesy of Dr. Ribeiro in sending me a manuscript copy of an unpublished paper¹ correcting some of these errors, I am enabled to place the records under their proper specific headings.

Numbers in parentheses following an author's name refer to the year of publication of the paper cited and will serve as an index to the full reference in the Bibliography. To avoid endless repetition, however, such parenthetical numbers have generally been omitted from the Systematic List. The authors there cited are discussed under Previous Work.

Many of the Brazilian bird-names have been taken directly from the aborigines, and all have far greater right to existence than the artificial English terms unknown beyond the covers of books. Therefore I have exerted myself to collect here as many as possible of those in actual use by the natives. Where they occur in the text they have not been italicized, but have been given the same standing accorded to English names of North American birds.

Altitudes given in this paper can be considered very close approximations. Constant checking with three stations of known elevation reduced the error to a minimum and proved my aneroid to be remarkably accurate. In fact, it has agreed within a fifth of a millimeter with the official mercurial barometer at Alto Itatiaya. The altitude of each collecting station was carefully determined and the bezel of the aneroid set at this determination each day before leaving camp.

The accompanying plates are without exception from photographs taken during the progress of the survey, and faithfully depict conditions then existent upon the mountain.

¹Since published as 'Nota Critica sobre a Ornis do Itatiaya.' See Ribeiro, 1923.

SYSTEMATIC LIST OF ITATIAYA BIRDS¹

TINAMIFORMES

Tinamidæ. Tinamous

*Crypturus*² *obsoletus obsoletus* (Temminck)

Inhambú-Guassú

This species, one of the commonest of the Brazilian tinamous and a game bird eagerly sought by the natives, was not collected by me. Ribeiro records a specimen taken in *campo* on Morro Redondo (6800 ft.), and there are two others in the Museu Nacional do Rio de Janeiro, taken in forest by Pedro Velho, who writes that the birds are common from below Monte Serrat up to Macieiras (6100 ft.).

Lüderwaldt often observed the Inhambú in a forest of tall trees, and states that it is easily recognized by its plaintive call, which is heard at all seasons. Although he had the birds right before him several times, he was unable to obtain a specimen, and says that their manner showed that they were often hunted. He writes further that in unfrequented places, when in the shade, they have little fear and can easily be watched.

*Crypturus*² *tataupa tataupa* (Temminck)

Inhambú-Chintam, Inhambú-Chororó

I examined at the time of capture a specimen of this tinamou taken by Pedro Velho, of the Museu Nacional, February 23, 1922, at about

¹The manuscript of this paper was written at my home in Alabama, and first submitted for publication in February, 1923. In 1925, when the Itatiaya papers of Ribeiro and Pedro Velho (Archivos do Museu Nacional, XXIV, 1923) reached my hands, it was recalled and revised at Carnegie Museum. But nearly all of the two succeeding years I spent afield, and the manuscript was finally put into type before it could be again brought up to date. Thus I have been unable to avail myself of Dr. Hellmayr's catalogues of the Furnariidæ, Dendrocolaptidæ, and Tyrannidæ (Parts IV and V, 'Catalogue of Birds of the Americas'), and my nomenclature within these families will be found out of line at a number of points. Fortunately, most of the differences lie in merely generic designations—a matter of no consequence because nowadays one must carry in mind anyway a half dozen generic names for each species—but in three cases specific names that I have used have been shown by Dr. Hellmayr to be untenable. Therefore the following changes in my nomenclature become essential:

Heliolethrus superciliosus (Lichtenstein) to *Heliolethrus contaminatus* Berlepsch;

Dendrocolaptes picumnus picumnus Lichtenstein to *Dendrocolaptes platyrostris platyrostris* Spix;

Knipolegus comatus (Lichtenstein) to *Knipolegus lophotes* Hellmayr.

²After more than one hundred years of usefulness the name *Crypturus* has recently come into disfavor. In 1914, Brabourne and Chubb (Ann. and Mag. Nat. Hist., Ser. 8, XIV, p. 322) proposed to split the old genus, and erected a new one, *Crypturellus*, to accommodate the species *tataupa* and *parvirostris*, which were alleged to differ from the other members of the group chiefly in the position of the nostrils. *Crypturellus* was later found to be preoccupied, and in 1917 Chubb (Bull. Brit. Orn. Club, XXXVIII, p. 30) substituted for it the name *Microcrypturus*. In 1922, Dr. Oberholser (Proc. Biol. Soc. Washington, XXXV, p. 73) recognized Chubb's new genus and rejected *Crypturus* of Illiger, proposing in its stead the name *Cryptuornis*.

I have examined every specimen of *Crypturus* and so-called *Microcrypturus* in the Carnegie Museum collection and find inconstant the chief character on which the genus was split. While the nostrils in *tataupa* and *parvirostris* are inclined to be definitely posterior in the few specimens of these two species at hand, in other species of *Crypturus* their position varies from posterior to anterior, with perhaps the majority of specimens having the nostrils in the middle of the bill. Nor do I find other characters of sufficient diagnostic value to place *tataupa* and *parvirostris* in a separate genus. Should *Crypturus* really be untenable, then it must be replaced by *Microcrypturus*, as this name antedates *Cryptuornis*. But I share the implied opinion of Dr. Stone (The Auk, 1922, p. 585) that *Crypturus* might very well be let alone.

3100 ft., on the main trail below the Ponte Maromba. Owing to this positive identification the following notes on other small Inhambús, seen in almost the identical spot, are referred to the same species.

December 19, 1921, five purplish eggs, containing small embryos, were discovered in a depression, lined with old leaves, in the soil under the grass in an old clearing grown up with small trees, at 3000 ft. on a west slope. So closely did the parent sit that the nest was revealed only when trod upon and a handful of feathers sent flying from the bird. Unfortunately the eggs were crushed.

While riding down from the Ponte Maromba, January 12, 1922, a parent with a single young was surprised in the trail at 3100 ft. The adult immediately took wing, leaving the chick to hide under a small herbaceous plant, where it was captured by hand without attempt at escape.

***Rhynchotus rufescens rufescens* (Temminck)**

Perdiz

Ernesto Ule, writing in 1896, states that Perdizes were very common on the *campos* (6500–7500 ft.) during certain seasons of the year. Nine years later Ribeiro published a record of nesting, but made no mention of the bird's abundance. In the first half of November he discovered one sitting upon seven eggs in a poorly made nest on the ground, in a tussock of *cabeça de negro* (*Xyris* sp.). Only eggshells were found in the abandoned nest the last of that month. Lüderwaldt saw the bird only once, although he was told that the species was numerous (in 1906). He speaks of it as a heavy clumsy bird and says that it is hard to get without dogs.

During my own sojourn of six weeks at Alto Itatiaya I observed the species but three times, once among the trees of an old apple orchard, and twice on open *campo*. All were at approximately the same altitude, 7200 ft. No specimens were secured.

***Nothura maculosa maculosa* (Temminck)**

Codorna, Codorniz

The only record of the Spotted Tinamou's occurrence on Itatiaya is contained in Ribeiro's introduction, where he states that it was heard morning, noon, and evening, and that one was seen near his camp. The context indicates that the bird inhabited the *campos* (about 7000 ft.).

GALLIFORMES**Cracidæ. Curassows and Guans*****Penelope obscura bronzina* Hellmayr****Jacú, Jacú-Guassú**

Penelope jacu-açu SPIX, Ribeiro, p. 179.

Penelope obscura ILLIGER, Lüderwaldt, p. 337.

Penelope boliviana ILLIGER, Ribeiro, 1923, p. 253.

A guan taken at Alto Itatiaya (about 7200 ft.) was reported by Ribeiro as *Penelope jacu-açu* Spix, a bird of northern and western Brazil. This determination he endeavors in his 'Nota Critica' (1923, pp. 241-242) to sustain by quoting Hellmayr (1914, *Novitates Zoologicae*, XXI, 176-178), but the quotation is so rendered as to be entirely misleading. Incidentally, it may be mentioned that Hellmayr's original description of *P. o. bronzina* appears on p. 178 of the work cited, and that in his list of material examined appear specimens from the States of São Paulo, Rio de Janeiro, and Minas Geraes. Although Lüderwaldt repeated the error by republishing Ribeiro's record under the caption of *P. jacquassu* Spix, instead of including it in his own account of *P. obscura*, there can be no doubt that Ribeiro's specimen is referable to the present form.

Lüderwaldt writes that he often saw small groups of three to five birds busy in the brush or forest, but that he was never able to get within shooting distance because of their shyness.

This species I found to be a fairly common inhabitant of the forest zone, and observed it along the main trail from 3700 to 6650 ft. The birds were always off the ground in trees. Two females collected at 3800 ft. were shot at dusk from a *couve de burro* tree (*Croton* sp.), where they were making their supper of the fruit.

The Jacú is one of the finest of game birds, not too hard to bag, and its flesh is highly esteemed by the natives. It proved a most welcome addition to my own menu.

Pipile jacutinga* (Spix)*Jacutinga**

Ribeiro states in a footnote that he observed the Jacutinga in the zone of forest. It is not mentioned by other authors,¹ and was not found by me.

¹Carvalho (1900) does mention the Jacutinga, but his book is so purely a literary work that little scientific value can be attached to the record.

Odontophoridae. Quails and Partridges**Odontophorus capueira (Spix)****Capoeira, Urú**

This forest partridge was often found on the slopes of the mountain by Lüderwaldt, who quotes the Brazilians as saying that its call heard in the morning indicates rain, but when heard at evening, clear weather. Ribeiro saw it in the zone of forest on his ascent of the *serra*; and Pedro Velho collected two at Monte Serrat.

At the time of my visit, Capoeiras were reported to be common on the forested slopes below Monte Serrat, but I myself did not observe the species.

COLUMBIFORMES**Columbidae. Pigeons and Doves****Columba plumbea plumbea Vieillot****Pomba Amargosa, Caçuirova, Gemedeira**

Reported from Alto Itatiaya (7200 ft. more or less) by Ribeiro. Lüderwaldt also collected the species. He states that it is not a shy bird, and expresses the belief that it could be tamed. One visited him for a couple of days in a stable at Alto Itatiaya.

I found this fine pigeon not uncommon on the mountain from 2700 to 6900 ft. It is a bird of the forest or reverted clearings. At Macieiras (6100 ft.) a number were observed flying out of an unoccupied mud hut which they had apparently appropriated for their own dwelling. Later, when I assumed the occupancy of this house, the pigeons still frequented the old orchard which filled the clearing, and several were taken, not only to furnish food for scientific thought, but also to supplement my fare of beans and rice. The natives of Itatiaya call the bird Pomba Amargosa (Bitter Pigeon) because, they say, its flesh is bitter at certain seasons. During my stay there the season must have been propitious, for I found the pigeons most excellent.

Chamæpelia talpacoti (Temminck and Knip)**Pomba-Rola, Rolinha**

One was seen at Bemfica (1700 ft.), beside a road through an open valley.

Leptotila reichenbachi Pelzeln

Jurity, Jurity do Matto Virgem

Leptoptila rufaxilla (RICHARD AND BERNARD), Ribeiro, p. 180.

A dove taken on the Caminho do Couto (Alto Itatiaya) by Moreira was erroneously recorded by Ribeiro in 1905 as *Leptoptila rufaxilla* (Rich. and Bern.), an extralimital species. Dr. Ribeiro has since re-examined this specimen and corrected his determination to *L. reichenbachi* (1923, p. 243).

Although doves were heard calling on several occasions along the main trail, I was never fortunate enough to secure a specimen.

GRUIFORMES**Cariamidæ.** Screamers**Cariama cristata** (Linnæus)

Seriema

Microdactylus cristatus LINNÆUS, Lüderwaldt, p. 339.

The only Itatiaya record is that of Lüderwaldt, who writes that early one morning he saw two Seriemas about 100 meters from the house at Alto Itatiaya (7150 ft.), where they betrayed themselves by their strange loud cries. They became silent as soon as he looked out of the window, and he expresses surprise that such shy birds should dare to approach so near a dwelling. The real surprise is that they should have ascended to the Temperate Zone.

CATHARTIFORMES**Cathartidæ.** Vultures**Coragyps atratus brasiliensis** (Bonaparte)

Urubú, Corvo

Catharistes atratus BARTREILLE, Ribeiro, p. 173.*Catharista atratus brasiliensis*, LÜDERWALDT, p. 339.

It is remarkable that Ribeiro observed only one pair of Urubús (on the Pedra Assentada, about 8000 ft.), and that Lüderwaldt, during his stay of seven weeks of Alto Itatiaya, did not see the species at all.

I found Black Vultures fairly common; considering the forested nature of the country. Groups of two to five were often seen soaring above Monte Serrat (2700 ft.), and, though not quite so numerous at Alto Itatiaya (7150 ft.), the birds were frequently seen, and at least one was noted at an altitude of 8650 ft. I was told that they nest every year among the rocks at the summit of the Morro dos Urubús (7200 ft.).

Cathartes aura, subspecies

Urubú-Péba, Corvo de Cabeça Vermelha, Urubú Caçador

Ænops aura (LINNÆUS), Ribeiro, p. 173.

Ribeiro states that this vulture kept to the lower altitudes, soaring over the slopes of the foothills near Campo Bello.

I have observed it high above Alto Itatiaia (perhaps 7500 ft.), and, though not half so numerous as its black cousin, the Urubú, I have no doubt that it ascends to equally great altitudes.

ACCIPITRIFORMES.**Falconidæ.** Hawks and Falcons

Milvago chimachima chimachima (Vieillot)

Carácará

Mentioned by Ribeiro in a footnote. Lüderwaldt devotes a considerable paragraph to the species, stating that it was found among cattle as everywhere in Brazil. He says it is a funny sight to see one of these birds sitting on a cow.

The species was not observed by me.

Micrastur ruficollis (Vieillot)

Gavião Matteiro, Gavião Caburé

Ribeiro records a specimen taken in a copse near the Morro dos Carneiros (6800 ft.).

Accipiter erythronemius erythronemius Kaup

An immature male was taken from a dead tree top on an open slope at 7100 ft., on the Morro dos Carneiros trail. A large tick (probably *Ixodes auritulus* Neumann) was attached to the flesh in the fork of the mandible.

Rupornis leucorrhoa (Quoy and Gaimard)

Two specimens were taken, at 3700 and 6600 ft. The first was shot in an old clearing, and the other at the beginning of the *campo* on the main trail.

Elanoides forficatus yetapa Bonnaterre and Vieillot

Gavião Thesoura, Tapema, Tapenna

Elanoides forficatus (LINNÆUS), Lüderwaldt, p. 340.

Lüderwaldt observed a flock of about 30, high in the air, migrating (?) slowly southward on May 8.

Cerchneis sparverius cinnamomina (Swainson)

Quiri-Quiri

Tinnunculus sparverius cinnamomimus SWAINSON, Lüderwaldt, p. 341.

Lüderwaldt observed an adult and an immature in a small wood at Alto Itatiaya (6500–7500 ft.).

STRIGIFORMES**Bubonidæ.** Owls¹**Ciccaba hylophilum** (Temminck)

A single specimen was taken in a thicket in an old clearing at 3800 ft.

Glaucidium brasilianum brasilianum (Gmelin)

Caburé

Specimens were taken at 2500 and 3800 ft., and the species was found to be common in the low growth of reverted clearings between those altitudes. It is more or less diurnal during foggy weather, and every individual observed was about in broad daylight.

PSITTACIFORMES**Psittacidæ.** Parrots and Parrakeets**Eupsittula auricapilla aurifrons** (Spix)

Conurus auricapillus (LICHTENSTEIN), Ribeiro, p. 181.

Ribeiro states in a footnote that he saw this species in the zone of forest. It has not been noted by other observers.

Pyrrhura vittata vittata (Shaw)

Tiriba, Periquito

Ribeiro reports five specimens from the Caminho do Couto (7000 ft. ?); Pedro Velho, two from Monte Serrat.

I took specimens at 2700, 5650, and 5900 ft., and observed the species up to 7200 ft.

The Tiriba is one of the commonest, and certainly the noisiest, of the birds on Itatiaya. At Monte Serrat (2700 ft.) small flocks came every day to feed in the Paraná pines (*Araucaria brasiliana* Lambert) just above the reservation headquarters buildings. While thus engaged the birds remained quiet, except for a low twittering, and would allow such a close approach that on one occasion I secured two with a single

¹Lüderwaldt devotes a page and a half to *Pulsatrix*, stating, among other things, that he often heard it in the orchard near the house at Alto Itatiaya (7150 ft.), but he did not venture a specific name.

shot from my auxiliary. When disturbed, they would always first dart downward with startling screams, and then fly swiftly away, filling the air with their raucous cries. A flock of about half a dozen contested with me the title to the ripening fruit in the apple orchard at Macieiras (6100 ft.) throughout my stay there—March 22 to April 7.

Three large worms, *Ascaridia truncata* (Zeder), were found in the abdominal cavity of a specimen collected at Monte Serrat.

***Psittacula vivida vivida* Ridgway**

Periquitinho

Psittacula passerina (LINNÆUS), Velho, p. 260.

Pedro Velho records one specimen from Monte Serrat, and writes that the birds exist there in great numbers.

I too collected specimens at Monte Serrat (2700 ft.); and several times observed the species on the brushy deforested slopes there, and I saw it also at Bemfica (1700 ft.), but I do not consider the bird more than fairly common.

***Pionus maximiliani maximiliani* (Kuhl)**

Maitaca

Pionus menstruus (LINNÆUS), Velho, p. 260.

A bird of the heavier forests. It was observed along the main trail below Macieiras (5200–5500 ft.), and a single specimen was taken from a small flock at 5300 ft.

Following the general rule that the larger the bird the warier it is, these parrots present considerable difficulty to the collector. While perched they are silent, and, as they usually resort to the tallest tree tops, where they either sit motionless or move with great deliberation, their presence is seldom detected until, with a sudden uproar, the flock makes off headlong through the forest.

To my ear their notes are less harsh and piercing than those of *Pyrrhura v. vittata*. And their flocks are smaller, the largest I observed containing only five individuals.

Pedro Velho's statement that *Pionus menstruus* occurs in "*grande quantidade*" at Monte Serrat refers, of course, to the present form, though I can not agree that the bird is abundant. Neither did I find it so low.

Pionopsitta pileata (Scopoli)

Periquito-Rei, Cuiú-Cuiú

Three were observed by Lüderwaldt while he was climbing the Agulhas Negras. They were flying west, he says, at an altitude that must have been 3000 meters.

This beautiful species was noted only once by me. On that occasion I shot a single specimen from a flock of five feeding in a *couve de burro* tree (*Croton* sp.) in an old clearing at 3800 ft. My camp man said that it is a rare bird on Itatiaya.

CORACIIFORMES**Caprimulgidæ.** Nightjars**Macropsalis forcipata** Nitzsch

Curiango-Tesoura

Noted but once, at Macieiras (6100 ft.). One evening, as the last faint colors of sunset were fading into night, three or four of these strange long-tailed goatsuckers and one short-tailed individual were observed coursing low over the western end of the orchard. A lucky shot brought one to earth.

Cypselidæ. Swifts**Streptoprocne zonaris zonaris** (Shaw)

Andorinhão, Taperuçu

Chaetura biscutata (SCLATER), Ribeiro, p. 182.

Ribeiro records a specimen taken at Alto Itatiaya, and states that the species was breeding in November.

I found it common above Monte Serrat (2700 ft.), where scores course over the deforested slopes at mid-altitude. For a few moments the air overhead may be filled with careening black bodies darting here and there, and then suddenly all are gone, gliding swiftly down to lower levels on set pinions with a whistling like a strong wind through telegraph wires. At other times a couple of hundred birds may mount high in air and circle together in a confused mass, suggesting the milling of some herd of aerial cattle. The few specimens in my collection might be considered a tribute to my marksmanship were it not for the mute witness of many empty cartridges strewn about at certain points of vantage on the tops of treeless ridges.

My highest record for the species is furnished by a rough skin hanging in the meteorological station at Alto Itatiaya (7150 ft.). The bird was shot there October 30, 1921.

Cypseloides fumigatus Streub

Cries of noisy nestlings at Monte Serrat (2700 ft.) on December 24, 1921, led me to explore the attic above my room. There I found a typical swift's nest of twigs glued together and attached to the bricks on the inside of the gable, simply crammed with five young just sprouting pinfeathers. The parents had access to the attic through two ventilating holes in the end wall. January 9 the attic was again visited and the five fledglings, now fully feathered and almost ready to fly, were found bunched together, clinging to the bricks of the wall near the abandoned nest. One was taken down to my room, carefully identified, and returned to its perch. Adult swifts were often seen at Monte Serrat, and one specimen was taken.

Trochilidæ. Hummingbirds**Phæthornis squalidus** (Temminck)

Taken at 3000 and at 7400 ft., and seen at intermediate altitudes. This hummer is apparently not restricted to any particular habitat; it was observed on open *campo*, in reverted clearings, in thick *crissiuma* bamboo (*Arthrostylidium* sp.), and in dwarf forest.

Phæthornis pretrei (Lesson and Delattre)

February 23, 1922, Pedro Velho collected an example of this species at Monte Serrat (2700 ft.). I examined the specimen, which is now in the Museu Nacional.

Melanotrochilus fuscus (Vieillot)

This striking hummer was common over the deforested slopes about Monte Serrat (2700 ft.). Collected.

Chlorostilbon aureoventris pucherani (Bourcier and Mulsant)

Lepidopyga goudoti (BOURCIER), Ribeiro, p. 181.

Chlorostilbon aureiventris LAFRESNAYE AND D'ORBIGNY, Ribeiro, 1923, p. 244.

A single specimen (wing 48.5, bill 16 mm.) was taken from a low bush in my dooryard in an old clearing at 3800 ft. Ribeiro recorded another from Monte Serrat under the name *Lepidopyga goudoti*, but has subsequently changed his determination to *Chlorostilbon aureiventris* Lafresnaye and D'Orbigny.

Thalurania glaucopis (Gmelin)

A male was collected in thick second-growth forest at 3200 ft., near Monte Serrat.

***Petasophora serrirostris* (Vieillot)**

Collected and often observed by Lüderwaldt. He says that it is one of the shyer hummers which apparently prefers the small separate clumps of bushes.

I took a male that was perched, singing, on the bare twigs of a bush at 6800 ft., on the Caminho do Couto. Others were heard.

***Leucochloris albicollis albicollis* (Vieillot)**

Ribeiro records a specimen from the Caminho do Couto. Lüderwaldt observed the species almost daily and often collected it.

I found it to be the commonest hummingbird on Itatiaya. It inhabits alike brushy deforested slopes, reverted clearings, open *campo*, and the isolated copses of dwarf forest, and was observed from 2700 to 8050 ft. About Monte Serrat it was quite usual to find the birds perched on the terminal twigs of bushes, trilling like some orthopterous insect. Collected.

***Clytolæma rubicauda* (Boddaert)**

Clytolæma rubinea (GMELIN), Ribeiro, p. 181; Lüderwaldt, p. 344.

Ribeiro records two taken at Alto Itatiaya. Lüderwaldt often collected it in the same locality.

I noted the species from 3800 to 7900 ft., in reverted clearings, low forest, and the bushes and copses on the high *campos*. Collected.

***Calliphlox amethystina* (Gmelin)**

A single individual was collected in low open brush at Monte Serrat (2700 ft.).

***Stephanoxis lalandi* (Vieillot)**

Reported from Alto Itatiaya (7200 ft. more or less) by Ribeiro. Lüderwaldt writes that in spite of the altitude and the raw climate of the winter months at Alto Itatiaya, the hummingbirds, apparently the most delicate of all birds, remain there the year round. After a freezing night he found the present species, *Leucochloris a. albicollis*, and *Clytolæma rubicauda* still on the wind-swept heights.

The Plover-Crest was observed by me from 3800 to 8150 ft., but it is especially a bird of the higher altitudes, where it is common about the borders of the dwarf forests and the copses of bushes scattered over the rocky *campos*. Collected.

TROGONES**Trogonidæ. Trogons****Trogonurus aurantius (Spix)**

Surucuá

Trogon aurantius (SPIX), Velho, p. 260.

Lüderwaldt saw a pair in the woods near Monte Serrat, but did not commit himself to a specific name. My collection of *aurantius* in the same locality and the fact that no other species of trogon was seen on Itatiaya make reasonable the inclusion of his record here. Pedro Velho also collected Surucuás near Monte Serrat.

All that I observed were in reverted clearings or second-growth forest at 3000 ft.

COCYGES**Cuculidæ. Cuckoos****Piaya cayana macroura Gambel**

Alma de Gato, Rabo de Palha, Alma de Caboclo

Piaya cayana (LINNÆUS), Lüderwaldt, p. 346; Velho, p. 260.

Seen once by Lüderwaldt on the top of a tree, and taken once by Pedro Velho.

The species is not uncommon in the forest and old clearings at mid-altitudes (3000-5200 ft.). Collected.

Crotophaga ani Linnæus

Anú Preto

Pedro Velho reports seeing a band of this species at Monte Serrat.

The Anú Preto, one of the commonest birds of the cultivated districts of Brazil, makes little attempt to encroach upon the mountain fastness of Itatiaya. A number were observed from 1600 to 1900 ft., in the open river bottom at Bemfica (one flock containing fourteen individuals). Another flock of four frequented the deforested area about Monte Serrat (2700 ft.). Collected.

Guira guira (Gmelin)

Anú Branco

This species, like the Anú Preto, is a bird of the cultivated lowlands, and several were seen in the open valley at Bemfica (1600 ft.). A record of its remarkable occurrence at Alto Itatiaya is attested by a rough skin that hangs in the meteorological station here. This specimen was killed in November, 1921, at 7150 ft.

SCANSORES**Ramphastidæ. Toucans****Ramphastos ariel Vigors****Tucano do Bico Preto**

Pedro Velho, in May, 1921, examined at Bemfica (1600 ft.) the fresh skin of a toucan of this species that had been killed in the nearby forest.

Ramphastos discolorus Linnaeus**Tucano, Tucano do Bico Verde**

According to Ribeiro, Moreira collected a specimen of this species on the Morro dos Carneiros (6800 ft.). Lüderwaldt says that they often betrayed themselves in the forest by their calls, but were too shy for him to think of hunting them.

In the latter observation I concur, for though Tucanos were seen on several occasions in reverted clearings in the zone of heavy forest (3400–3800 ft.), I found it vain to attempt to bag them. They kept to the tops of tall trees from which they had an unobstructed view for many yards around, and always took flight long before I could get within shotgun range. However, I examined in hand an adult female shot by a native in a clearing at 2500 ft.

I was told that these birds commonly catch and eat young chickens, but I can not vouch for this.

Baillonijs bailloni (Vieillot)**Arassari, Tucaninho**

This is one of the few birds that I observed in virgin forest. Four or five were seen at 3700 ft., feeding together on a dark blue juicy fruit in the tree tops of the unbroken timber above the Ponte Maromba. Several others were noted on different occasions in the tops of tall trees growing up through the tangles of reverted clearings along the main trail (3700–3800 ft.). Collected.

Selenidera maculirostris (Lichtenstein)**Arassari-Pocca, Sari-Pocca**

Two males of this species were taken at Monte Serrat (2700 ft.) on May 18, 1921, by Pedro Velho. I later examined them in the Museu Nacional.

PICIFORMES**Bucconidæ. Puffbirds****Malacoptila torquata torquata** (Hahn and Küster)

João Barbudo, João Doido

One found by Lüderwaldt in *campo* (about 7000 ft.) was being pursued by other small birds as if it were an owl. Pedro Velho took one at Monte Serrat.

I took the species on two occasions, both times at 3100 ft., perched over trails through second-growth forest.

Picidæ. Woodpeckers**Soroplex campestris campestris** (Vieillot)

Pica-Páu do Campo, Chan-Chan

Colaptes campestris (VIEILLOT), Ribeiro, p. 180; Lüderwaldt, p. 346.

Two taken at Alto Itatiaia are reported by Ribeiro. Lüderwaldt writes that at Alto Itatiaia the flickers have to eat ants (*Camponotus rufipes* F.) because there are practically none of the hill-building termites which in other parts of the country serve as their only food. He says they were usually seen in pairs, seldom in threes.

I found a flock of five living on the *campo* at Alto Itatiaia (7150 ft.). They were extremely wary birds, and a specimen was secured only by surprising the flock at a turn in the trail. A group of five flushed from the *campo* on the summit of the Morro dos Carneiros (6850 ft.) might possibly have been composed of the same birds.

Chloronerpes aurulentus (Temminck)

Collected by Lüderwaldt at Alto Itatiaia, and by Pedro Velho at Monte Serrat.

I took two specimens at about 3600 ft., near the Ponte Maromba; one on the main trail and the other in virgin forest.

Chrysoptilus melanochloros melanochloros (Gmelin)

Ribeiro records a specimen of this woodpecker from Monte Serrat, and saw the species on the Caminho do Couto.

My specimens were taken in the reverted clearings (3550-3800 ft.) near the Ponte Maromba. Only a few individuals were seen.

Tripsurus flavifrons (Vieillot)

Benedicto, Pica-Páu do Matto Virgem

Ribeiro records four from the Caminho do Couto (6500–7000 ft.).

I observed the species at lower altitudes (2500–5900 ft.), in more or less open situations along the main trail. Collected.

Veniliornis spilogaster (Wagler)*Dendrobates ruficeps* (SPIX), Ribeiro, p. 181.¹

Three males from the Caminho do Couto and the Morro Redondo are recorded by Ribeiro. Pedro Velho took a female at Monte Serrat.

I noted the species in a garden (2700 ft.), in reverted clearings (3700–3800 ft.), and in dwarf forest (7150 ft.). Collected.

Phlæoceastes robustus robustus (Lichtenstein)

Pica-Páu Soldado

This bird was seen at a distance by Lüderwaldt, though he did not commit himself beyond a generic designation.

I took a specimen in dwarf forest at 7200 ft., and saw two other individuals in a reverted clearing at 3600 ft. on the main trail.

Picumnus cirrhatus cirrhatus Temminck

Piculets were not uncommon about Monte Serrat (2700–3100 ft.). A couple were taken in the garden of the reservation headquarters, another in tall bracken in a brush-grown pasture, and still another in bamboo in second-growth forest. Others were observed in a reverted clearing at 3800 ft.

PASSERIFORMES**Hylactidæ.** Babblers .**Scytalopus speluncæ** (Ménétrières)*Scytalopus sylvestris* TACZANOWSKI, Ribeiro, p. 185.In 1905 Ribeiro recorded (p. 185) two tapacolas taken at Alto Itatiaya as *Scytalopus sylvestris* Taczanowski, a species described from Peru. Two years later the Iherings included this record under *Scytalopus speluncæ* in their 'As Aves do Brazil' (p. 191). Dr. Ribeiro has never agreed to this disposition, and in his last paper (1923, pp. 246–247) he reviews the whole case at considerable length, but with unfortunate results. Besides an erroneous reference to Hellmayr, there is an effort¹Subsequently corrected to *Veniliornis spilogaster* (Wagler). See Ribeiro, 1923, p. 245.

to link *S. sylvestris* with *S. speluncæ* as "forms of development" of *S. magellanicus*, and a suggestion that Euler's designation of *S. magellanicus* for the Nova Friburgo bird must be changed to *S. niger* (Swainson). It is regrettable that Dr. Ribeiro did not see Hellmayr's positive identification (1907, p. 76) of a fully adult male from Itatiaya as *S. speluncæ*, nor the article by Chapman (1915, *The Auk*, XXXII, pp. 406-423) wherein it is shown that all known South American forms of *Scytalopus* are confined to the Andean region, except *S. indigoticus* and *S. speluncæ*. The latter is corroborated by the later allocations of Cory and Hellmayr (1924, pp. 10-23). Thus, even without considering the present series from the same locality, Dr. Ribeiro's Itatiaya specimens can be referred without hesitation to *S. speluncæ*.

Lüderwaldt often collected the species in the thick undergrowth at Alto Itatiaya and writes at length of its curiosity, trustfulness, and mouse-like habits, and the difficulty of securing specimens. He says that it looks so much like a shadow that once in the twilight he shot at a shadow thinking it to be *Scytalopus*.

My own experience with the bird was extensive and interesting. It is a dweller of the dwarf forests and the dense tangles of bamboo (*Arthrostylidium* and *Chusquea*), and is most abundant above 5000 ft., following the forests until they lose themselves (at about 8000 ft.) in isolated patches amidst the chaos of rocks on the higher peaks. It is, however, fairly common as low as 3700 ft. In both action and appearance it is peculiarly wren-like as it hops about from stem to stem, within a few inches of the ground, in the heaps of rubbish littering the forest floor or in the piles of dead bamboo that are its especial haunts. It responds readily to squeaking, and its curiosity brings it from considerable distances to ascertain the cause of a disturbance within the range of its faculties. I have had one to approach within a yard of me while I retrieved a bird of some other species shot in a bamboo tangle. A series was collected.

Even little *Scytalopus* is not immune from parasitization by ticks, and on the head of one individual I found no less than six of these creatures (probably *Ixodes auritulus* Neumann).

***Scytalopus indigoticus* (Wied)**

A single specimen was collected in dense brush at 3200 ft., in a damp ravine near Monte Serrat.

Conopophagidæ. Gnateaters**Conopophaga lineata** (Wied)

Cuspidor, Chupa-Dente

Ribeiro reports specimens from Alto Itatiaya. The bird often lives in the same localities with *Scytalopus*, according to Lüderwaldt, but is more easily shot because, instead of hiding like that species, it sits on some limb at a short distance and watches the hunter.

I, too, found it of a confiding disposition, deliberate in its movements, and exhibiting considerable curiosity. It is a bird of the undergrowth, and was recorded from 3000 to 6900 ft. Collected.

Formicariidæ. Antbirds**Batara cinerea cinerea** (Vieillot)

Borralhara, Matraca

A pair was taken in a vine-entangled old clearing at 3650 ft. on the main trail.

Mackenziaena leachii (Such)

Borralhara

Thamnophilus leachi SUCH, Lüderwaldt, p. 350.

One found in thick brush by Lüderwaldt paid so little attention to him that he was able to approach it within eight or ten steps.

I collected the species in undergrowth at 5200 and 6200 ft.

Mackenziaena severa (Lichtenstein)

Borralhara

Specimens were taken in tangled thickets and undergrowth from 2900 to 3800 ft.

Thamnophilus cærulescens cærulescens Vieillot

Thamnophilus pileatus SWAINSON, Ribeiro, p. 184.

Thamnophilus cærulescens albonotatus SPIX, Lüderwaldt, p. 350; Ribeiro, 1923, p. 247; Velho, p. 261.

Ribeiro reported two specimens from Alto Itatiaya as *Thamnophilus pileatus* Swainson, and stated that the species was breeding in November. It was collected also by Lüderwaldt, but he republished Ribeiro's record under the name *Herpsilochmus pileatus* Swainson, with a query. Pedro Velho took a specimen at Monte Serrat.

This bush-shrike is a confident, unhurried denizen of undergrowth, tangles in old clearings, and dwarf forests, and is common from 3000 to

7900 ft. Birds taken at the higher altitudes were commonly parasitized by *Ixodus auritulus* Neumann. Five of these ticks were attached in a bunch to the throat of a specimen shot at 7000 ft.

Rhopochares ruficapillus (Vieillot)

Choca

Specimens were taken from 1600 to 7250 ft. This species, like the last, is an inhabitant of thickets, undergrowth, and low forest, but is apt to be found in more open situations than *Thamnophilus c. caerulescens*. High altitude specimens were parasitized by *Ixodes auritulus* Neumann.

Dysithamnus mentalis mentalis (Temminck)

Taken at 3400 and 3600 ft., in second-growth forest.

Dysithamnus xanthopterus (Burmeister)

A pair was taken from a loose band traveling through the forest at 5200 ft., and another individual was collected on the edge of a clearing at 6100 ft.

Drymophila ferruginea (Temminck)

Trovoada

Several specimens were collected in bamboo, and in tangles of vines in reverted clearings from 2900 to 5500 ft.

Drymophila ochropyga (Hellmayr)

Found in company with *Drymophila ferruginea* in dense tangles of vines and underbrush from 2900 to 3800 ft. Collected.

Drymophila genei (Filippi)

Formicivora erythrocerca SCLATER, Lüderwaldt, p. 350.

Lüderwaldt says that he collected this species both in and out of the forest. He remarks that it is very curious, and relates that he once saw one hopping only a couple of yards away, missed it twice, and then even after his second shot it came closer again, more excited this time, and was killed with a third shot.

This active little ant-wren is preëminently a bird of the dense tangles formed by the drooping, interlacing stalks of *crissiuma* bamboo (*Arthrostylidium* sp.), and its distribution is practically co-extensive with that of the plant. It therefore attains its greatest abundance in the upper

reaches of the tall-forest zone (5500–6000 ft.), though it is common in the dwarf forests up to 7500 ft., and I have taken a specimen as low as 3800 ft. For about 1700 ft. along the main trail the ranges of *Drymophila genei* and *D. ferruginea* overlap, and at 3800 ft. *D. genei* meets *D. ochropyga*.

Always on the qui vive, this bold midget is quick to greet the intruder who ventures into its shadowy retreats.

***Terenura maculata* (Wied)**

A single specimen was taken at 3100 ft., beside a trail through second-growth near Monte Serrat.

***Pyriglena leucoptera* (Vieillot)**

Papa-Formiga, Papa-Taóca

A bird of the underbrush. Collected, 3100–3800 ft.

***Myrmoderus loricatus* (Lichtenstein)**

One was taken in undergrowth in a damp ravine (3100 ft.) near Monte Serrat.

***Chamaeza ruficauda ruficauda* (Cabanis and Heine)**

Tovaca

Chamaeza brevicauda (VIEILLOT), Ribeiro, p. 184.

Ribeiro reports three specimens from Alto Itatiaya.

I recorded the species from 3800 to 7150 ft., but found it most common between 5000 and 6000 ft.

The Tovaca is a ground bird typical of the bamboo tangles. It has a habit of moving its tail up and down pump-handle-wise, holding the member almost erect during pauses. During my visit the forest rang with its song—a low-pitched throaty rattle, with rising inflection and of short duration, suggesting a tree frog. Sometimes two neighboring birds would sing reciprocally.

The skin and flesh of this ant-thrush are so tender that great care is necessary in the preparation of specimens. Its flesh is white, and delicate of flavor, and the individuals I collected served both ornithological and culinary purposes.

***Grallaria varia imperator* Lafresnaye**

Tovacassú

Though this ground dweller was often heard, it is so shy that it was taken only once. Then it was surprised in dense undergrowth (at 3700 ft.), so near that the necessary quick shot completely ruined the specimen.

Dendrocolaptidæ. Ovenbirds, Woodhewers, etc.**Furnarius rufus badius** (Lichtenstein)

João de Barro

Furnarius rufus (GMELIN), Velho, p. 261.

Pedro Velho took two specimens at Monte Serrat.

Several Ovenbirds' nests were found by me in the Paraná pines at Monte Serrat (2700 ft.), but only a single rather wild bird was seen there (in January). In April the species was common and noisy in bush-dotted pastures at Bemfica (1600 ft.). Collected.

Lochmias nematura nematura (Lichtenstein)

Tridy, Macuquinho

Lüderwaldt writes that this is one of the few birds he found in the rocky treeless valley just in front of the Agulhas Negras (about 7500 ft.).

I did not find the species so high. My specimens were collected between 2800 and 6700 ft.

This dendrocolaptid is quite wren-like in appearance, and its chattering scold also is suggestive of a wren, but as it flits from stone to stone along the beds of the cool swift streams that are its chosen haunts it brings to mind the Dipper.

The natives of the Serra do Caparaó call the bird "Tiririca," an onomatopœic designation which to my mind is much preferable to either of the common names listed by the Iherings.

Synallaxis ruficapilla Vieillot

Pichororé, Turucuhé, Curutié

Inhabits the tangled undergrowth of reverted clearings. Collected, 2900-5100 ft.

Synallaxis spixi spixi Sclater

João Tenenê, Bentereré

This is the dominant bird species of the rank growth of *samambaia* (gigantic bracken) which covers the deforested slopes both above and below Monte Serrat. It was recorded from 1600 to 3800 ft. Collected.

Synallaxis cinnamomea russeola (Vieillot)

Curutié, Marrequito do Brejo

A pair was taken in a marshy spot in the open fields at Bemfica (1600 ft.).

***Synallaxis moreiræ* Ribeiro**

Garrixa-Chorona

This species was described by Ribeiro (p. 182) from three specimens taken by Dr. Carlos Moreira on the Morro Redondo (about 6800 ft.), and was named in honor of the collector. It was subsequently collected by Lüderwaldt and Pedro Velho. The former remarks that the bird is not a pretty flier, and in windy weather appears awkward.

It does hurtle from bush to bush in a rather jerky manner because of its extremely long tail, but it is so gentle and confiding, so inquisitively friendly, that I can not think of it as being awkward. In fact I often paused to admire the grace and dexterity with which it manages that same exaggerated appendage as it climbs about from twig to twig through some thick shrub or, with legs widely spread, balances itself between two upright stalks of grass, each grasped firmly in a tiny foot.

Of all Itatiaya birds this is the most trustful. Its frank friendliness seems to imply that it expects only kindness of the larger beings it comes in contact with, and the collector who would take a series (exceedingly desirable from the type locality) must steel himself to downright murder. Once, as I approached a low copse, five came out to greet me, and even though I rudely shot a bush-shrike almost from their very midst, they evinced no fear, but remained within a few feet, hopping about through the bushes in an effort to ascertain what my business might be. On another occasion a little squeaking brought ten hurrying out of a small thicket, agog with curiosity.

Though not primarily a grass-dweller, *Synallaxis moreiræ* is restricted to the zone of natural *campo*. Here it is the most abundant bird, and is found chiefly about the brushy margins of the dwarf forests and in clumps of bushes scattered over the grassy slopes and swales. My altitudinal records for the species run from 6550 to 8500 ft.

For a number of years after this species was described it was known only from Itatiaya. Now, however, Dr. Ribeiro informs me that he has recently discovered it in the Organ Mountains, just north of Rio de Janeiro, and in July, 1922, I collected specimens on the Serra do Caparaó, over 200 miles northeast of the type locality.

In common with most other Alto Itatiaya birds *S. moreiræ* often serves as a host for ticks.

***Siptornis pallida* (Wied)**

Synallaxis pallida (PR. MAX.), Ribeiro, p. 182.

One reported by Ribeiro from the Caminho do Couto.

I found it living in undergrowth and in the dwarf-forest copses, and collected specimens from 5000 to 7150 ft.

Philydor rufus (Vieillot)

Three specimens were taken in second-growth between 2700 and 3800 ft.

Heliobletus superciliosus (Lichtenstein)

One was taken in forest at 5300 ft., on the main trail.

Xenicopsis rufo-superciliatus (Lafresnaye)

Anabasitta rofossuperciliata LAFRESNAYE, Ribeiro, p. 182.

Xenicopsis rufosuperciliatus oleaginus SCLATER, Lüderwaldt, p. 352.

Xenicops oleagineus SCLATER, Ribeiro, 1923, p. 254.

Ribeiro records two specimens from the Morro dos Carneiros (about 6800 ft.), and Lüderwaldt reports two others, presumably from Alto Itatiaya.

I took the species from 3800 to 7150 ft. It is found in low forest, and seems rather partial to bamboo.

Anabazenops fuscus (Vieillot)

Apparently the favorite haunt of this species is the leafy tops of the giant bamboo, *taquarassú*. The fact that I collected it only between 2700 and 3550 ft. strengthens the idea of a correlation between the bird and the plant.

Sittasomus sylviellus sylviellus (Temminck)

Sittasomus erythacus (LICHTENSTEIN), Ribeiro, p. 182.

Two specimens taken between the Morro Redondo and the Morro dos Carneiros are reported by Ribeiro.

I collected one in dwarf forest at 7000 ft., on the Morro dos Carneiros trail, and others in low growth down to 3000 ft. In its hunting habits this bird is much like the Brown Creeper (*Certhia*).

Xiphocolaptes albicollis albicollis (Vieillot)

Arapassú

Ribeiro records a specimen from the Caminho do Couto (6500–7000 ft.), and Lüderwaldt, who saw the species only once, collected it, presumably at Alto Itatiaya (7200 ft. more or less).

My specimens were taken at a much lower altitude; in fact I did not see the bird above 5100 ft., and found it common only in the reverted

clearings above the Ponte Maromba (3600–3800 ft.). Here the birds spend their time searching the tall first-growth trees left standing in the clearings—long since abandoned to a riot of vines and shrubbery.

It is a curious fact that with the present species there occurs another, *Dendrocolaptes p. picumnus*, of identical habits, equally common, and so similar in appearance that the natives do not distinguish between them.

Lepidocolaptes fuscus fuscus (Vieillot)

Picolaptes tenuirostris (LICHTENSTEIN), Ribeiro, p. 182.

Picolaptes squamatus (LICHTENSTEIN), Ribeiro, 1923, p. 248.

Recorded by Ribeiro from the Caminho do Couto (6500–7000 ft.).

My only two specimens were taken in bamboo-entangled forest at 3250 and 3550 ft.

Campylorhamphus falcularius (Vieillot)

Arapassú de Bico Curvo

Xiphorhynchus procurrens (TEMMINCK), Ribeiro, p. 182.

Ribeiro reports one from a small cõpse on the Morro dos Carneiros (about 6800 ft.).

I took a single specimen at 5000 ft., in a thicket beside the main trail.

Dendrocolaptes picumnus picumnus Lichtenstein

Arapassú, Tarasca

Pedro Velho records one specimen from Monte Serrat.

Collected by me in second-growth forest and old clearings, 3000–3850 ft. See remarks under *Xiphocolaptes a. albicollis*.

Tyrannidæ. Tyrant Flycatchers

Tænioptera cinerea cinerea (Vieillot)

Pombinha das Almas, Maria Branca

Tænioptera nengeta (LINNÆUS), Ribeiro, p. 184.

Ribeiro reports a specimen from Alto Itatiaya (7200 ft. more or less), and it is stated by Moreira that this bird of the *campos* was noted there by him in July, characterizing the winter fauna of the region.¹

Lüderwaldt writes (p. 352) that he saw a pair of another species, with snow-white underparts, which he thought to be *T. velata* (Lichten-

¹These records are referred provisionally to the typical form, although no specimens are available from southeastern Brazil; nor have we any of *T. c. obscura* Cory from Bahia.—W. DeW. Miller.

stein), but as the birds did not permit a close approach I consider this sight record too indefinite to afford a basis for including *Tænioptera velata* in the list of Itatiaya species.

***Knipolegus comatus* (Lichtenstein)**

Maria Preta

One of a pair at Alto Itatiaya (7200 ft. more or less) was taken by Lüderwaldt. Moreira writes that he noted the species continually on the *campos* in July, stating that it is one of the characteristic winter birds, but it is very probable that he saw *K. nigerrimus* instead of *K. comatus*.

I secured one specimen (1700 ft.) and saw another (1600 ft.) at Bemfica.

***Knipolegus nigerrimus* (Vieillot)**

Maria Preta, Viuvinha

Specimens are recorded from Alto Itatiaya by Ribeiro and Lüderwaldt, and a single male is reported from Monte Serrat (2700 ft.) by Pedro Velho.

My lowest record is supplied by an immature male collected at 3800 ft., and, at least during the months from December to April, individuals seen below the *campos* were plainly stragglers. At Alto Itatiaya I observed the bird as high as 8300 ft.

This flycatcher is one of the commonest tyrannids of the upper altitudes. Its vesture of coal-black makes it conspicuous even when perched motionless upon the terminal twigs of a dwarf-forest copse; when it flits from bush to bush across the open *campo*, the flashing of its white wing-patch is almost startling.

The Maria Preta is one of the many hosts of *Ixodes auritulus* Neumann. One of these ticks remained attached for 27 hours to a specimen taken at 7150 ft., and then loosed its hold only because I forcibly removed it.

***Knipolegus cyanirostris cristatus* (Lesson)**

Maria Preta

Knipolegus cyanirostris (VIEILLOT), Ribeiro, p. 184; Velho, p. 262.

Ribeiro records two males from a copse on the Caminho do Couto (6500–7000 ft.); Pedro Velho, another from Monte Serrat.

While I found the species common from 3700 to 7150 ft., it is a remarkable fact that all specimens taken above 5900 ft. were females, and that no adult males were seen above 3800 ft.

On the *campos* this bird lives in the copses of dwarf forest; lower down, most of the individuals noted were in low growth beside the trail.

The species is parasitized by a tick probably identical with that of *K. nigerrimus*.

Muscipira vetula (Lichtenstein)

One reported from the Morro Redondo (about 6800 ft.) by Ribeiro, and two from Monte Serrat by Pedro Velho.

I secured one at 6150 ft., in the edge of a patch of thin forest, and another in an old clearing at 3800 ft. Two more were seen at the latter place.

Colonia colonus colonus (Vieillot)

Viuva, Viuvinha

Seen only in tall first-growth trees left standing in the old clearings at about 3800 ft. on the main trail. Collected.

Platytriccus mystaceus (Vieillot)

A bird of the undergrowth. Collected, 2850–5900 ft.

Rhynchocyclus sulphureus sulphureus (Spix)

Three specimens were taken in thick bamboo undergrowth near Monte Serrat (2900–3100 ft.).

Todirostrum poliocephalum (Wied)

Cagasebo, Teque-Teque

Several were taken and a number seen in the open brush of the deforested slopes about Monte Serrat (2700–3000 ft.). A wild fig tree in the reservation headquarters yard was a popular resort.

Euscarthmus nidipendulus subspecies

Cagasebo

A single immature male of this species was taken in the brush at Monte Serrat (2700 ft.). According to Mr. Miller, it can not be definitely separated, so far as color is concerned, from six skins of *Euscarthmus n. nidipendulus* or from one supposed to be *E. n. paulistus* that are contained in The American Museum of Natural History. It differs from all in the yellowish-tipped middle wing coverts, but this is probably due to immaturity. *E. orbitatus* is greenish yellow instead of whitish below. Wing measurements compare as follows:

Itatiaya specimen No. 189,148,	♂ im.	47.5 mm.
<i>Euscarthmus n. nidipendulus</i> ,	Type	44 "
" " "	"	42 "
" " "	♂, Bahia	43 "
" " "	Sex ?, Bahia	42 "
" " "	♀, Bahia	41.5 "
Doubtful type of <i>E. orbitatus</i> ,		
apparently = <i>nidipendulus</i>		47 "
<i>Euscarthmus n. paulistus</i> , ♂		46.5 "

***Orchilus auricularis* (Vieillot)**

Cigarra

The local name, Cigarra (Cricket), is peculiarly appropriate for this midget flycatcher, since it is actually smaller than many Itatiaya hummingbirds. It was collected in second-growth forest and old clearings, 3000–3800 ft.

***Hemitriccus obsoletus* (Ribeiro)**

Hemitriccus vilis IHERING, 1902, Revista Mus. Paulista, V, p. 270. (Ypiranga specimen, No. 146, only; *vide* Hellmayr).

Musciphaga obsoleta RIBEIRO, 1905, Arch. Mus. Nac. Rio de Janeiro, XIII, p. 183 (orig. descr.). HELLMAYR, 1907, Bull. Brit. Orn. Club, XIX, p. 76 (crit.).

Hemitriccus diops IHERING AND IHERING, 1907, 'As Aves do Brazil,' p. 270 (Itatiaya specimens). HELLMAYR, 1915, Verh. der Orn. Gesell. Bayern, XII, 2, p. 133, part (references; crit.; measurements).

Hemitricus obsoleta LÜDERWALDT, 1909, Zool. Jahrb. (Syst.), XXVII, Heft 4, p. 353.

Hemitricus obsoletus RIBEIRO, 1923, Arch. Mus. Nac. Rio de Janeiro, XXIV, pp. 251, 252, 254 (crit.; measurements).

A specimen taken on the Caminho do Couto (alt. 6500–7000 ft. ?) supplied the basis for Ribeiro's original description of *Musciphaga obsoleta*. Lüderwaldt also took specimens (one of which I have examined) at Alto Itatiaya, but did not report them.

The six birds I collected were taken in *crissiuma* bamboo (*Arthrostyidium* sp.), at altitudes ranging from 5800 to 7500 ft.

From the beginning this species has been involved in the confusion that has always surrounded *Hemitriccus diops* (Temminck), and therefore has not been recognized by taxonomists. The cause of this confusion is not difficult to ascertain, if one cares to delve into the literature, but how to unravel the tangle is entirely another matter. I essayed the task, and after a thorough study of all published references that could be found, in conjunction with all pertinent specimens that could be brought together, I was forced to conclude: (1) that the plates and

descriptions of Temminck's *Muscicapa diops* and Ihering and Ihering's *Guracava difficilis* represent the same bird (a form closely allied to *Phylloscartes ventralis*, but lacking wing bars); (2) that Ribeiro's *Musciphaga obsoleta* needs a new genus; and (3) that a bird from the Organ Mountains, congeneric with *obsoleta*, is new to science.

However, when these results were submitted to Dr. Hellmayr for criticism they were rejected *in toto*. Dr. Hellmayr has personally examined seven of the eight specimens collected by Natterer, some of which served as the basis of Temminck's plate and description of *Muscicapa diops*, and he assures me that these specimens are identical with the Organ Mountain bird that I thought to be new. That being the case; then the published plate and description of *Muscicapa diops* certainly do not represent the bird Temminck had in hand, unless, perchance, he based them on Natterer's eighth specimen which has since been lost. However, Temminck designated no type. Moreover, Temminck's plate and description more accurately define *Guracava difficilis* than do the Iherings' plate and description which purport to represent that species. If it can not be shown that Temminck intended to describe the bird now known as *Guracava difficilis*, then the only thing to do is to discard his plate and description as unidentifiable.

When it is considered that the uncertainty of the meaning of Temminck's *Muscicapa diops* led Ihering in 1902 to list specimens of *Hemitriccus obsoletus* (cf. Hellmayr, 1915) and *Guracava difficilis* (though both were then undescribed) under the name *Hemitriccus vilis*, it is not surprising that Ribeiro's *Musciphaga obsoleta* should be considered a synonym of *Hemitriccus diops*. However, I have no hesitancy in restoring this bird to full specific rank, although it is very closely related to the Organ Mountain bird. If, as Dr. Hellmayr has stated (*loc. cit.*), a specimen from Ypiranga agrees with a topotype of *obsoleta*, while another skin from the same locality is referable to *diops*, that fact alone is sufficient to establish the specific distinctness of the two forms. That two subspecies of the same non-migratory species do not occur in the same locality is axiomatic.

In order to obviate further confusion regarding *Hemitriccus obsoletus* (Ribeiro) there is appended a description of the species, and measurements of the seven Itatiaia skins that I have handled.

DESCRIPTION.—Upper parts between medal bronze and dark citrine; tail hair-brown, wings more dusky, the outer webs of both margined with citrine; inner webs of remiges margined with light buff; lores and orbital region tawny buff without definite line of demarcation above or below, except sometimes just above the lores; throat and breast between wood-brown and buffy brown, this color continued along

sides to blend with color of back; a slightly lighter patch on middle of throat; middle of abdomen creamy white or buffy; tibiae brownish; crissum ochraceous; under wing coverts buff-yellow at bend of wing, paling inwardly; maxilla black; mandible generally very pale (yellowish in old specimens), but sometimes brownish or black. Sexes alike.

MEASUREMENTS.—Male (4 specimens): Wing, 57–59 (average, 58.2); tail, 49.5–54 (51.9); culmen, 10–10.5 (10.1); width of bill at nostril, 4–4.5 (4.2); tarsus, 19–21 (20.1). Female (3 specimens): Wing, 52–53.5 (52.7); tail, 43–46.5 (44.8); culmen, 11; width of bill at nostril, 3.5–4.5 (4); tarsus, 18.5–19 (18.8).

***Guracava difficilis* Ihering and Ihering**

Hemitriccus diops IHERING, 1898, Revista Mus. Paulista, III, p. 185 (Alto da Serra, São Paulo; *fide* Hellmayr).

Hemitriccus vilis IHERING, 1902, Revista Mus. Paulista, V, p. 270 (Alto da Serra specimen only; *fide* Hellmayr).

Musciphaga diops RIBEIRO, 1905, Arch. Mus. Nac. Rio de Janeiro, XIII, p. 183 (Serra do Itatiaya).

Guracava difficilis IHERING AND IHERING, 1907, 'As Aves do Brazil,' p. 271 (Serra do Itatiaya, and Alto da Serra, São Paulo; orig. descr.). LÜDERWALDT, 1909, Zool. Jahrb. (Syst.), XXVII, Heft 4, p. 353. BRABOURNE AND CHUBB, 1912, 'Birds South Am.,' p. 279. IHERING, 1914, Revista Mus. Paulista, IX, p. 414, colored Pl. IV. RIBEIRO, 1923, Arch. Mus. Nac. Rio de Janeiro, XXIV, p. 251 (crit.).

Hemitricus diops LÜDERWALDT, 1909, Zool. Jahrb. (Syst.), XXVII, Heft 4, p. 353. RIBEIRO, 1923, Arch. Mus. Nac. Rio de Janeiro, XXIV, p. 254.

Ribeiro records a male of this species from the old Caminho do Couto (6500–7000 ft.?) as *Musciphaga diops* Temminck. Later, a specimen taken by Lüderwaldt (May 13, 1906) on the Campos do Itatiaya (= Alto Itatiaya) furnished the type of the species.

My collection comprises three males and three females, taken at altitudes ranging from 5900 to 7200 ft.

This little green flycatcher is one of the few forms apparently restricted on Itatiaya to the Temperate Zone, where it inhabits the dense copses and the tangles of bamboo. It occurs also in the upper edge of the forest zone. When "squeaked" the bird responds readily enough, but accompanies its emergence from its retreat with much snapping of its bill.

The perplexing status of this species has been remarked upon under *Hemitriccus obsoletus* and need not be further discussed here. It seems desirable, however, to clear the case as much as possible, and to this end the following description of *Guracava difficilis* Ihering and Ihering is subjoined, together with the measurements of my six Itatiaya skins.

DESCRIPTION.—Upper parts rather dark yellowish oil green; wings and tail between deep mouse-gray and dark olive-gray, the outer webs of the feathers margined with the color of the back, most broadly on the proximal halves of the rectrices; inner webs of the remiges margined, most broadly towards the bases, with pale olive-buff;

eye-ring white or yellowish white, continued into a yellowish white or yellowish spot before the eye and just above the dusky lores, and sometimes coalescing as a band across the bases of the frontal feathers; separating this spot from the green crown above, there is sometimes a distinct narrow black line; the sides of the head below the eye are dusky, and there is usually a silver patch on the auriculars; throat and breast between light neutral gray and light mouse-gray, somewhat mottled; chin the same, but more distinctly mottled with whitish and dusky; sides, and sometimes sides of breast, washed with the color of the back; middle of abdomen creamy white; crissum yellowish with a tinge of green; tibiae more or less Roman green; bend of wing pale lemon-yellow, the under wing coverts paler; maxilla black; basal half of the mandible light horn-color, the tip usually black, but the color of the mandible and even of the maxilla is variable. The sexes are indistinguishable.

MEASUREMENTS.—Male (3 specimens): Wing, 54–56.5 (average, 55.3); tail, 55.5–58 (56.5); culmen, 8.5–10 (9.2); width of bill at nostril, 3.5; tarsus, 18.5–19 (18.8). Female (3 specimens): Wing, 51.5–52.5 (52.2); tail (2 specimens only), 52.5–54 (53.2); culmen, 8.5–10 (9.2); width of bill at nostril, 3–3.5 (3.3); tarsus, 18–18.5 (18.3).

***Phylloscartes ventralis ventralis* (Temminck)**

Recorded by both Ribeiro and Lüderwaldt. The former writes that it produces a snap analogous to that made by the butterfly *Ageronia feronia*.

I noted the species between 5200 and 8050 ft., in forest and copse, and collected a series.

***Pogonotriccus eximius* (Temminck)**

One was collected in an old clearing at 3600 ft.

***Serpophaga subcristata* (Vieillot)**

Alegrinho

Lüderwaldt took the species, presumably at Alto Itatiaya (7200 ft. more or less).

I collected a pair from low bushes in an open weedy field at Bemfica (1600 ft.), and another specimen from a Paraná pine at Monte Serrat (2700 ft.).

***Pipromorpha rufiventris* (Cabanis)**

Collected principally in bamboo undergrowth, 3100–6100 ft.

***Phyllomyias brevirostris brevirostris* (Spix)**

Cagasebinho

Collected by Lüderwaldt, presumably at Alto Itatiaya (7200 ft. more or less).

Camptostoma obsoletum obsoletum (Temminck)

Taken in the low brush of old clearings at 2500 and 3400 ft.

Elænia parvirostris parvirostris Pelzeln

An immature bird was taken at Ponte Maromba (3800 ft.), and five other specimens near Macieiras (5650–6100 ft.).

Elænia mesoleuca Cabanis and Heine¹

Eight specimens were collected between 5900 and 7250 ft., five of them at 6900 ft. or higher.

This is the preponderant flycatcher of Itatiaya. Dull of color and demure of action, it would pass unnoticed but for its voice. Its call, which is similar to that of *Chiroxiphia caudata*, is delivered from bamboo tangle to tree top, often from some bare terminal twig high above the forest floor, and its notes ringing throughout the day are the most typical sounds within the dwarf forests.

Elænia obscura obscura (Lafresnaye and d'Orbigny)

Guracava, Guaracava

Two specimens are reported from the Morro Redondo (about 6800 ft.) by Ribeiro.

Two were taken by me in brushy clearings at 2500 and 3000 ft., near Monte Serrat.

Pitangus sulphuratus maximiliani (Cabanis and Heine)

Bem-Te-Vi

Lüderwaldt writes that he found the Bem-Te-Vi at Alto Itatiaya, and often heard it calling from the tops of the Paraná pines near the *fazenda* (7150 ft.). According to him it descends the *serra* upon the advent of the first frost.

I did not find the bird at Alto Itatiaya although I visited the heights during the warmer months. In fact I saw it no higher than 3800 ft.

¹Mr. Holt's specimens of this species and the preceding were recorded in his manuscript as *E. albiceps* (Lafresnaye and d'Orbigny). They are clearly separable into two species, and it will be noted that their altitudinal ranges are in the main distinct, but slightly overlap at the junction of the Sub-tropical and Temperate Zones.

E. mesoleuca has a wider bill than *E. parvirostris*, the culmen more curved, the gonys much shorter (width of maxilla at base much greater than length of gonys, in *E. parvirostris* merely equal to gonys); no crest; ninth primary usually shorter than seventh (in *E. parvirostris* usually longer than seventh); tail slightly longer. The maxilla is pale or tipped with brown (in *E. parvirostris* tipped with blackish) white in crown restricted, usually wholly wanting; upper parts greener; wing-bars more olivaceous edges of outer webs of remiges and rectrices greener.

E. parvirostris is distinctly crested, and the white in the crown is always conspicuous.

E. albiventris Chapman appears to be a recognizable race of *E. parvirostris*, from which it differs in its wider, flatter bill, and greener upperparts.—W. DeW. Miller.

On the other hand, it was common and noisy over the deforested slopes about Monte Serrat (2700 ft.), and was noted at Bemfica (1500 ft.). Collected.

Myiodynastes solitarius solitarius (Vieillot)

Siriritinga

One was taken from a Paraná pine at Monte Serrat (2700 ft.).

Megarynchus pitangua pitangua (Linnæus)

Bem-Te-Vi do Bico Chato, Pitangoá, Nei-Nei

A male taken (about 2500 ft.) May 20, 1921, at Monte Serrat, and recorded by Pedro Velho, was examined by me at the Museu Nacional.

Hirundinea bellicosa bellicosa (Vieillot)

Birro

Pedro Velho took one at Monte Serrat.

I saw a group of four among the Paraná pines at Monte Serrat (2700 ft.), and collected two males.

Myiobius ridgwayi Berlepsch

Taken in undergrowth, 3100–3600 ft.

Myiophobus fasciatus flammiceps (Temminck)¹

Cagasebo

Two were seen in a weedy sedge field at Bemfica (1600 ft.). Collected.

Empidonax euleri euleri (Cabanis)

Collected in brushy clearings and bamboo undergrowth, 3000–6100 ft.

Myiochanes cinereus (Spix)

Two were taken from perches beside the main trail, 3800 and 5000 ft.

Myiarchus ferox swainsoni Cabanis and Heine

Irré, Pae Augustinho

I secured two in old clearings near Monte Serrat (2700 and 3000 ft.).

Empidonomus varius varius (Vieillot)

A couple of specimens were taken in brush near Monte Serrat (2700 and 2850 ft.).

¹Cf. Hellmayr, *Novitates Zoologicae*, XXXII, 1925, p. 176.

Tyrannus melancholicus melancholicus Vieillot

Siriri

One was taken by Pedro Velho at Monte Serrat. Ribeiro records it from Alto Itatiaya (7200 ft. more or less).

I found the Siriri fairly common about large trees left standing on the deforested slopes around Monte Serrat (2700 ft.), and collected it also in an old clearing at 3800 ft.

Pipridæ. Manakins**Chiroxiphia caudata** (Shaw)

Tangará, Dansador

Pedro Velho records a male from Monte Serrat.

I found the species common near Monte Serrat, and collected specimens between 3000 and 3400 ft.

The Tangará is a beautiful and most interesting bird, but, as it chooses to hide its brilliant plumage and queer capers in the obscurity of the densest undergrowth, it is seldom seen. Its characteristic calls, however, enliven stretches of forest often otherwise silent. The fantastic dancing contests of the male are among the most remarkable phenomena of bird behavior.¹

Manacus manacus gutturosus (Desmarest)

Rendeiro Barbudinho, Monge, Corrupião

Chiromachæris gutturosus (DESMAREST), Velho, p. 262.

Pedro Velho records two from Monte Serrat.

I collected one in bamboo in a ravine near Monte Serrat (2700 ft.), and heard another calling near-by.

Scotothorus unicolor (Bonaparte)

But two specimens of this species were obtained; one in second-growth forest in a damp ravine at 3000 ft., the other in a thicket at 3800 ft. The first harbored a huge leech under the skin of the crown.

Neopelma aurifrons (Wied)

A male was taken in dense second-growth at 3000 ft.

¹One of these exhibitions that I witnessed near Rio de Janeiro is described in *The Auk*, XLII, October, 1925, pp. 588-590.

Cotingidæ. Cotingas**Tityra brasiliensis** (Swainson)

Araponguira, Canjica

Several were seen in reverted clearings between 3400 and 3850 ft. Collected.

Pachyrhamphus polychropterus polychropterus (Vieillot)

Canelleirinho

A single specimen was taken from a low tree in the open at Bemfica (1600 ft.).

Attila griseigularis Berlepsch

Tinguassú, Capitão de Sahira

Attila cinereus (GMELIN), Velho, p. 262.

Pedro Velho records a single male from Monte Serrat.

I noted the species in brushy clearings and in woods, 2400–3600 ft. One seen just above the Ponte Maromba was one of the few birds observed in virgin forest. Collected.

Phibalura flavirostris Vieillot

Tesourinha

Ribeiro, recording three specimens from Monte Serrat, states that the birds were breeding in November. He writes that they were seen also on the Morro dos Pinheiros in the zone of *campo*. Pedro Velho took a pair at Monte Serrat.

Several frequented the Paraná pines at Monte Serrat (2700 ft.) during my sojourn there, and on another occasion I counted 25 together in the top of a tall tree standing in an old clearing at 3800 ft. Collected.

Tijuca nigra Lesson

Saudade, Sobiador

This unusual bird was noted from 3800 to 6800 ft., but the bulk of my records pertain to the upper limit of heavy forest, directly below Macieiras (5500–6800 ft.). Here the black males with golden wings sit placidly in the tops of the giant trees and sing, and keen is the eye that discovers them. The green females pass unnoticed among the leafy branches. Collected.

My acquaintance with the Saudade¹ was considerable before I had actually seen the bird. My notebook contains altitudinal records based on song alone, but these are as sure as if the birds had been in hand, for that song once heard is not soon forgotten. In my experience it is unique, and to have heard it delivered amidst the full wealth of its lonely forest setting was one of the greatest privileges of my work upon Itatiaya. My first audience was impressive.

I had been long hours in the saddle. Now, amid lengthening shadows, I was traversing the upper reaches of the forest zone, no sound breaking the stillness of the heights save the *soc, soc* of the hoofs of my tired mule as it struggled through the mud. Unexpectedly there floated out upon the thin, clear air a vibrant note, a long-drawn plaintive whistle that rose in pitch and intensity, and then faded away in a mere thread of sound—withal so sad, so mournful, that it seemed the cry of some languishing wood sprite rather than a vibration of purely organic origin. With every sense alive, I craned my neck to see the tallest tree tops. Nothing moved except a great sparkling drop which fell from a rosette of bromeliads high overhead to splash into a puddle in the trail. After a tense moment, the disembodied voice drifted again through the trees, this time joined by another, the two singing in unison. I turned in my saddle then, and looked back and down as well as up, for the air seemed filled with sound, but the notes died away, leaving on every hand only silent green gloom. It was not until weeks after, when I trudged those high trails day after day, that I stumbled by chance upon the owner of that wonderful voice.

Hirundinidæ. Swallows

***Pygochelidon cyanoleuca* (Vieillot)**

Andorinha

Atticora cyanoleuca (VIEILLOT), Ribeiro, p. 173.

Reported common by Ribeiro. Lüderwaldt identified no species, but says, "The swallows; at least the greater part, migrate upon the first cold weather, for although I saw the birds very often when I first came to Itatiaya, after the first cold nights they disappeared, so that for whole days later on I would see none, or just one or two."

Swallows of this species were common at Monte Serrat (2700 ft.), and in December had nests under the roof tiles of the buildings. On

¹The word *saudade* is a poetic Portuguese term signifying memory imbued with longing. Its application to *Tijuca nigra* is evidence of the impression made upon the Brazilians by this bird's remarkable song.

January 10 a nest over my room was deserted except as a sleeping place. The birds were abundant at Bemfica (1600 ft.), coursing over the open fields, and the species was seen on the *campos* at Alto Itatiaya as high as 7900 ft. Collected.

Stelgidopteryx ruficollis ruficollis (Vieillot)

Many were seen coursing low over the deforested slopes about Monte Serrat (2700 ft.). Collected.

Troglodytidae. Wrens

Troglodytes musculus musculus Naumann

Corruira, Cambaxirra

A happy songster, common throughout the bushy fields at Bemfica and over the deforested slopes about Monte Serrat (1500–2700 ft.). Collected.

Mimidae. Mockingbirds and Thrashers

Mimus saturninus frater Hellmayr

Sabiá do Campo, Sabiá Pócca, Calandra, Arrebita-Rabo, Arrebita

Mimus saturninus (LICHTENSTEIN), Ribeiro, p. 185.

Ribeiro records a specimen from Monte Serrat (2700 ft.).

I saw the species only at Bemfica (1600 ft.), where a flock of a dozen individuals frequented the bush tops about an open pasture. The birds were so extremely wary that all efforts to secure a specimen were fruitless.

Turdidae. Thrushes

Platycichla flavipes flavipes (Vieillot)

Sabiá-Una, Sabiá Preto

Merula flavipes (VIEILLOT), Ribeiro, p. 185.

Ribeiro records a specimen from the Caminho do Couto (6500–7000 ft.), and states that the birds were breeding in November. Lüderwaldt writes that they were often seen and taken by him (at Alto Itatiaya).

My own records range lower, from 2700 to 5900 ft., and I found the Sabiá Preto common only through the reverted clearings dotted with tall first-growth trees, at about 3800 ft. on the main trail. Collected.

Planesticus rufiventer rufiventer (Vieillot)

Sabiá Larangeira

Turdus rufiventris VIEILLOT, Ribeiro, p. 185; Velho, p. 264.

A specimen is reported from Alto Itatiaya by Ribeiro, who says that the species was breeding in November. It was seen there almost daily by Lüderwaldt, and was collected by him. Pedro Velho took one at Monte Serrat.

I found the birds distributed from the brush of the deforested slopes about Monte Serrat up through the dwarf-forest copses at Alto Itatiaya (2700-7150 ft.). Collected.

A bulky nest of plant stems and fibers, mud, and green moss, lined with finer (but by no means soft) fibers, was discovered on January 19. It was placed about nine feet above the ground, in a leafy bush standing in a brush-grown pasture at 3000 ft., near Monte Serrat. The two eggs, which were partially incubated, measure 29×22 , and 32×22.5 mm.

Planesticus albicollis albicollis (Vieillot)

Sabiá Colleira, Sabiá do Matto

Turdus albicollis (VIEILLOT), Velho, p. 264.

Pedro Velho reports a specimen from Monte Serrat.

I saw several between 5900 and 6100 ft., in the upper border of the forest zone. Collected.

Planesticus amaurochalinus (Cabanis)

Sabiá Branco, Sabiá Pardo

Turdus leucomelas VIEILLOT, Lüderwaldt, p. 355.

Mentioned by Lüderwaldt as being seen at Alto Itatiaya.

I took specimens only in open situations at Bemfica and Monte Serrat (1600 and 2700 ft.).

Planesticus albiventer albiventer (Spix)

An adult female, undergoing a complete molt, was taken at Monte Serrat (2700 ft.) on January 11.

Vireonidæ. Vireos**Vireosylva chivi chivi** (Vieillot)

Juruviana

A specimen was taken in the shade trees at Monte Serrat (2700 ft.), and on December 27 a fledgling just able to fly was seen in the brush not far below.

***Pachysylvia poecilotis* (Temminck)**

Hylophilus poecilotes TEMMINCK, Ribeiro, p. 183.

Specimens are reported from Alto Itatiaya (7200 ft. more or less) by Ribeiro and Lüderwaldt.

I took three in the upper part of the forest zone (5300–5900 ft.).

***Cyclarhis ochrocephala ochrocephala* Tschudi**

Reported by Ribeiro, Lüderwaldt, and Pedro Velho.

I found the bird common, and singing, in the brush about Bemfica and Monte Serrat (1700–3000 ft.) and collected it as high as 6750 ft., in a dwarf forest between Terceiro Morro and the Morro dos Carneiros.

Mniotiltidae. Wood-Warblers***Compsothlypis pitiaiyumi pitiaiyumi* (Vieillot)**

Mariquita

A number were observed feeding through the foliage of low tree tops in an old clearing at 3800 ft. They moved with great agility and with scarcely a pause in their feverish search for insects. Collected.

***Geothlypis æquinoctialis cucullata* (Latham)**

Pia-Cobra, Cagasebo

Taken in brush at Bemfica and Monte Serrat (1900 and 2500 ft.).

***Basileuterus auricapillus auricapillus* (Swainson)**

Lüderwaldt records three, presumably from Alto Itatiaya (7200 ft. more or less).

I found this warbler common between 2000 and 6100 ft. It is particularly a bird of the underbrush and second-growth, where it flits through the tops of the smaller trees and shrubs. The leafy tops of the various bamboos seem to be especially attractive haunts. Collected.

***Basileuterus leucoblepharus* (Vieillot)**

Collected by Lüderwaldt.

This species I found common about Macieiras and Alto Itatiaya (5800–7150 ft.). It is a bird of the undergrowth, and was never seen more than a few feet above the ground. Its pleasing, cheery song is one of the characteristic bird notes of the bamboo growths at the upper altitudes. Collected.

Motacillidæ. Pipits and Wagtails**Anthus hellmayri brasiliensis** Hellmayr

Caminheiro

Anthus chii VIEILLOT, Ribeiro, p. 184; Lüderwaldt, p. 355.

Reported from Alto Itatiaya by both Ribeiro and Lüderwaldt. The latter writes that the birds were found in small groups (3-7) on the *campos*, where they live after the manner of larks.

I found the Caminheiro fairly common between 7100 and 8000 ft. It and the Perdiz (*Rhynchotus r. rufescens*) are the only two species absolutely restricted to the grass of the open *campos*. Collected.

Fringillidæ. Finches**Cyanocompsa cyanea cyanea** (Linnæus)

Azulão, Gurundi Azul, Catre

Common over the brushy slopes about Monte Serrat (2700-3000 ft.). It was collected also at Bemfica (1600 ft.).

Oryzoborus angolensis angolensis (Linnæus)

Avinhado, Curió, Papa-Arroz

Common in thickets and sedge fields in the open valley at Bemfica (1600 ft.). Collected.

Sporophila caerulescens (Vieillot)

Colleira, Papa-Capim, Tia-Tam

Reported from Monte Serrat by Pedro Velho.

The Colleira is a cheerful songster that prefers grassy situations, but it is abundant throughout the brush of the deforested slopes about Monte Serrat (2700 ft.). I found it common also in weedy fields at Bemfica (1600 ft.). Collected.

This is one of the favorite cage birds of Brazil.

Pitylus fuliginosus (Daudin)

Bico-Pimenta, Bicudo

A specimen is recorded from Monte Serrat by Ribeiro.

Several were seen by me in dense brush in a ravine at 3300 ft., and another was taken in giant bamboo at 3550 ft.

A specimen collected at the former altitude was the host of a large tick.

***Saltator similis similis* d'Orbigny and Lafresnaye**

Tico-Tico Goloso, Bico de Ferro, Pichorroren, Matia, João Congo

This is a sweet singer of the thickets in old clearings, and was observed from 1700 to 5300 ft. I found it most abundant, however, about Monte Serrat and the reverted clearings above the Ponte Maromba (2700–3800 ft.). In the upper part of the forest zone it is replaced by *Stelgidostomus maxillosus*. Collected.

***Stelgidostomus maxillosus* (Cabanis)**

Trinca-Ferro, Tico-Tico Goloso, Pichorolé

Moreira collected six specimens of this species, about Alto Itatiaya and the Lagoa Esgottada, which were reported by Ribeiro under the name *Saltator azaræ* d'Orbigny.¹ Three or four were taken by Lüderwaldt.

I observed the birds between 5300 and 7150 ft., and found them common in the low forest and undergrowth just below Macieiras (6100 ft.), where a series was collected.

This species is parasitized by ticks.

***Spinus ictericus ictericus* (Lichtenstein)**

Pintasilgo, Pintasilva do Campo

Ribeiro reports Pintasilgos from Alto Itatiaya, where the birds were seen in pairs on the *campos*. They were taken also by Lüderwaldt, who writes that several made their headquarters, during his entire stay at Alto Itatiaya, in the orchard near the house, and slept in the top of a Paraná pine near-by. Pedro Velho reports three from Monte Serrat.

I noted a few at Monte Serrat (2700 ft.), and on December 24 discovered a nest on the tip of a lateral branch of a Paraná pine there. A half dozen birds frequented the pines and apple trees near the meteorological station (7150 ft.) during my residence at Alto Itatiaya. Collected.

This is a common cage bird of Brazil.

***Sicalis flaveola holti* Miller²**

Canario da Terra

Sicalis flaveola (LINNÆUS), Lüderwaldt, p. 358; Velho, p. 263.

Lüderwaldt writes that he saw this species once at Alto Itatiaya (7200 ft. more or less). Pedro Velho reports a male from Monte Serrat.

¹Subsequently corrected to *Stelgidostomus maxillosus* (Cabanis). See Ribeiro, 1923, p. 253.

²The Auk, XLII, April, 1925, p. 254. Because Mr. Miller has erroneously ascribed the type locality—the whole Serra do Itatiaya, in fact—to the State of São Paulo, it seems necessary to emphasize the facts pointed out under Geographic Position; namely, that Itatiaya stands upon the boundary between Minas Geraes and Rio de Janeiro, but to eastward of the São Paulo line, and that practically all bird records of whatever author refer to the State of Rio de Janeiro.

I found the bird an inhabitant of the brush about Bemfica and Monte Serrat (1600 and 2700 ft.), and at the latter place collected the type specimen. The species seemed not averse to the vicinity of human dwellings, and at Monte Serrat a male often sang from the ridgepole of the barn.

***Myospiza humeralis manimbe* (Lichtenstein)**

Tico-Tico do Campo

A single specimen was collected in bushes in an open sedge field at Bemfica (1600 ft.).

***Poospiza thoracica* (Nordmann)**

Moreira collected five specimens (reported by Ribeiro) on the Caminho do Couto, the Morro Redondo, and at Alto Itatiaya. He writes that the species was noted continually in low woods on the *campos* in July, and that it is one of the common birds which characterize the winter fauna of the region. The species was also collected by Lüderwaldt.

I found this attractive little finch associated with *Poospiza lateralis* from 5650 to 7250 ft. Both are typical of the copses at Alto Itatiaya and of the low forest about Macieiras. *P. thoracica* is often found near the ground in the bamboo tangles, though it more commonly keeps to the tops of the low trees, where small groups flit like warblers through the foliage. One flock was seen which contained upwards of 25 individuals. Collected.

***Poospiza lateralis* (Nordmann)**

Obtained by Lüderwaldt, who writes that it is much rarer than *Poospiza thoracica*, and travels with it or other small birds. Reported also by Ribeiro (1923, p. 253).

My observations do not bear out the statement regarding its rarity. In fact, I found *lateralis* fully as common as *thoracica*, with which it is often associated, and its altitudinal range more extensive (3800–8050 ft.). Like *thoracica*, it is usually to be found in small bands, but it is more a bird of the undergrowth, not affecting the tree tops as does that species. It is a characteristic bird of the dwarf-forest copses at Alto Itatiaya, and the bamboo tangles along the main trail below Macieiras teem with them.

This species illustrates well the indifference displayed by birds that are never molested by man. One within a dozen feet of me in a thicket held its ground even when I fired at another individual a little beyond it.

Parasitized by ticks. Collected.

Brachyspiza capensis subspecies

Tico-Tico

Moreira noted the Tico-Tico continually about the house at Alto Itatiaya (7150 ft.) in July, and writes that it is a common species characteristic of the winter fauna. Ribeiro speaks poetically of it as forming part of a common picture always in view of the observer. But Lüderwaldt merely remarks that it can not in the least compare with "our" *Passer domesticus* for cleverness! Pedro Velho reports it from Monte Serrat.

My field notes show the Tico-Tico to be abundant about Bemfica and Monte Serrat (1500–3000 ft.), and common throughout Alto Itatiaya (7000–8150 ft.). It was not observed in the forest zone except in an old clearing (Lote 41, 3800 ft.) above the Ponte Maromba. At Monte Serrat the brush of the deforested slopes rang with its song.

In late December the birds were still nesting, and I found two sets of three partially incubated eggs each. A description of one nest will suffice for both. It was constructed of grass, lined with finer fibers and hair, and placed on the ground, under green herbaceous vegetation and dead bracken fronds, beside a trail across a deforested slope at 3000 ft. The six eggs range in size from 20×15 to 20.5×16 mm. Two fledglings and an egg were found in another nest at Alto Itatiaya (7150 ft.) on February 4. Two days later the young had left the nest.

The Tico-Tico is a characteristic bird of the bushes scattered over the bleak rocky *campos* of the highest ridges and valleys, but at these lonely altitudes this common dooryard sparrow is strangely shy.

Without a doubt this is the best-known bird in Brazil. Collected.

Embernagra platensis subspecies

Perdizinha do Campo

Ribeiro reports three specimens from the *campos* of Alto Itatiaya (7200 ft. more or less), and states that the species is insectivorous.

Donacospiza albifrons (Vieillot)

One was taken in a bush in an open field at Bemfica (1600 ft.).

Emberizoides herbicola herbicola (Vieillot)

Canario do Campo

Emberizoides macrourus GMELIN, Lüderwaldt, p. 358.

Seen by Lüderwaldt two or three times in a marshy spot near the house at Alto Itatiaya (7150 ft.).

I recorded the species only at Bemfica (1600 ft.), where several specimens were taken in bushes and sedge in open fields.

Haplospiza unicolor Cabanis

Pichóchó

This bird is usually to be found in small bands about the borders of the dwarf-forest copses at Alto Itatiaya (7150 ft.), though it is not an abundant species. A specimen taken here was the fattest bird that I have ever seen. Collected as low as 5600 ft.

Cœrebidæ. Honey-Creepers

Cœreba chloropyga chloropyga (Cabanis)

Cambacica, Mariquita

Fairly common at Bemfica and Monte Serrat (1600-3200 ft.). A wild fig tree in the reservation headquarters yard at Monte Serrat seemed to especially attract them. Collected.

A retort-shaped nest of grass, bamboo leaves, fine rootlets, and plant down, adorned with pieces of green moss, was discovered on January 19 about 5½ ft. above the ground, in a thorny herb in a brush-grown clearing at 3200 ft. The two partially incubated eggs measure 17.5×12, and 16.5×12.5 mm.

Were the volume of its song as great as the energy and persistence with which it is delivered, this gay mite would occupy the forefront among avian minstrels.

Dacnis cayana paraguayensis Chubb

Sahy Azul, Sahy Bicudo

One was taken while feeding on the fruit of a wild fig tree at Monte Serrat (2700 ft.).

Tersinidæ. Swallow-Tanagers

Tersina cœrulea cœrulea (Vieillot)

Sahy Andorinha, Sahy Arara, Sahira

One was collected from a eucalyptus at Monte Serrat (2700 ft.).

Tanagridæ. Tanagers

Tanagra pectoralis (Latham)

Tieté, Alcaide, Gaturamo Serrador

Three were seen between 3300 and 5100 ft., in old clearings. Collected.

Pipraeidea melanonota melanonota (Vieillot)

Viuva

A specimen is reported from the Morro dos Carneiros (6800 ft.) by Ribeiro.

Tangara cyaneiventris (Vieillot)

Sahy

Calospiza cyaniventris VIEILLOT, Velho, p. 264.

Pedro Velho took a pair near Monte Serrat.

I shot a couple from a flock of half a dozen or more feeding in low bushes in a reverted clearing at 3100 ft.

Tangara thoracica (Temminck)

Sahy Verde

Calospiza thoracica TEMMINCK, Lüderwaldt, p. 356.

Two were taken from a group at Alto Itatiaya (7200 ft. more or less) by Lüderwaldt, but he saw the species only once.

I took specimens from the tree tops at 2700, 5300, and 5700 ft.

Tangara flava chloroptera (Vieillot)

Sahy Amarello

Two specimens were collected on brushy slopes at 1900 and 2700 ft. One or two others were seen at the former altitude.

Stephanophorus diadematus (Mikan)

Azulão, Sanhaçu Frade, Azulão do Campo, Azulão da Serra, Sahyruçú,

. Lindo Azul

Stephanophorus leucocephalus (VIEILLOT), Ribeiro, p. 186; Velho, p. 263.

Six specimens are reported from Morro Redondo and from small copses at Alto Itatiaya by Ribeiro. Lüderwaldt also collected the bird at Alto Itatiaya. The single specimen taken by Pedro Velho at about 3000 ft., near Monte Serrat, constitutes the lowest record for the species.

The Azulão was found by me to be common through the lower growth of the upper border of the forest zone, and in the dwarf-forest copses, from 5000 to 7900 ft. At Alto Itatiaya its clear sweet song does much to relieve the oppressive stillness of the barren wastes of rock.

The species is parasitized by ticks (probably *Ixodes auritulus* Neumann). Collected.

***Thraupis cyanoptera* (Vieillot)**

Sanhaçu, Sahy-assú

One was collected from a Paraná pine at Monte Serrat (2700 ft.).

***Thraupis sayaca* (Linnæus)**

Sanhaço

Tanagra sayaca LINNÆUS, Velho, p. 263.

Pedro Velho reports a male from Monte Serrat.

The Sanhaço I found common among the Paraná pines, and in the trees about the garden, at Monte Serrat (2700 ft.). The birds seemed especially fond of the ripening papayas and wild figs. Collected.

***Thraupis ornata* (Sparrmann)**

Sanhaçu de Encontros, Sanhaçu da Serra

Tanagra ornata SPARRMANN, Ribeiro, p. 186.

One is reported from Monte Serrat by Ribeiro.

I took the species from 2700 to 5700 ft. It was common at Monte Serrat, and particularly numerous in the reverted clearings on the main trail at 3800 ft.

This tanager, like the last, was especially attracted by the wild figs at Monte Serrat.

***Piranga saira saira* (Spix)**

Canario do Matto, Sanhaço do Fogo

Ribeiro reports a specimen from the forest on the Caminho do Couto (6500 ft., more or less).

***Orthogonys chloricterus* (Vieillot)**

Orthogonys viridis (SPIX), Velho, p. 264.

Two males taken by Pedro Velho near Monte Serrat (about 3000 ft.), May 17, 1921, are preserved in the Museu Nacional at Rio de Janeiro.

***Tachyphonus coronatus* (Vieillot)**

Tié Preto, Gurundi Preto

A common inhabitant of thickets and second-growth about Monte Serrat. Collected, 2400–3800 ft.

On January 21, two eggs, containing large embryos, were found in a nest of broad grass leaves and plant stems, lined with a compact cup of rootlets, and placed three feet above the ground in a clump of tall, straight, herbaceous plants in a dense thicket at 3000 ft. The eggs measure 24×17 , and 25×17 mm.

Trichothraupis melanops melanops (Vieillot)

Tié de Topete

Common in the brush of reverted clearings, 3200–3800 ft. Collected.

Pyrrhocomma ruficeps (Strickland)

Pioró

One was taken and another seen in a reverted clearing at 3800 ft.

Cissopis leveriana major Cabanis

Pintasilva, Tiétínga, Prebixim, Anicavara

Pedro Velho collected three near Monte Serrat that were in the company of *Orthogonys chloricterus* and other birds.

This sweet singer in the guise of a magpie is common in small bands throughout the reverted clearings between 3000 and 3800 ft., and was recorded up to 5800 ft. It is numbered too among the few birds seen in virgin forest. Collected.

Except for its ability as a songster, the Pintasilva bears but little resemblance to a tanager, suggesting rather the jays in its actions. Once a bad shot failed to kill one instantly, and as it flew away its cries attracted several of its fellows, some of which burst into an ecstasy of song when the poor victim fell to the ground.

Schistochlamys capistrata (Wied)

Sanhaçu Pardo, Bico de Velludo

Several were collected in brush about Bemfica and Monte Serrat (1600–2700 ft.).

Icteridæ. American Blackbirds and Orioles**Ostinops decumanus decumanus** (Pallas)

Japú, Japú-Guassú

A small group of these birds was seen by Lüderwaldt in the forest below Monte Serrat.

Archiplanus albirostris (Vieillot)

Soldado, Melro

Cassicus chrysopterus (VIGORS), Lüderwaldt, p. 359.

Lüderwaldt writes that these birds were often seen by him, presumably at Alto Itatiaya.

I did not find them so high. Those I observed were living in reverted clearings and forest between 3800 and 5800 ft. They are singers of quaint songs, and are conspicuously dressed in yellow and black. Collected.

Cacicus hæmorrhous aphanes Berlepsch

Guache, Japuirá

Cacicus hæmorrhous (LINNÆUS), Velho, p. 263.

Pedro Velho reports two specimens from Monte Serrat.

I saw a number in second-growth forest, 3000-3200 ft. One specimen had under its scalp a leech which came out under the right eyelid onto my table when the bird became cold.

Molothrus bonariensis bonariensis Gmelin

Vira-Bosta, Coricho, Chopim

Lüderwaldt says of this bird, "Seen only two or three times by me, and always alone, whistling in the fruit trees near the house" (Alto Itatiaya, 7150 ft.). There is no other record of the species.

HYPOTHETICAL LIST

Phæthornis eurynome Lesson

Lüderwaldt states (p. 344) that he once saw this bird on the "Campo Itatiaya," and often at Monte Serrat. However, the species was noted by neither Moreira, Ribeiro, Pedro Velho, nor me, and, while there is nothing inherently impossible about Lüderwaldt's record, it is very probable that the birds he saw were *P. squalidus* (Temminck), a species that I found in both localities he mentions.

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Four birds are mentioned, and notes by Hemmendorff on plant regions are incorporated.)

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PLATES VI to XIX

PLATE VI

Itatiayassú or Agulhas Negras.

Culminating pinnacles of the Serra do Itatiaya, from the west. Rock is nepheleuc-syenite. South end of this 1200-ft. wall is shown on Plate XVI, fig. 2.

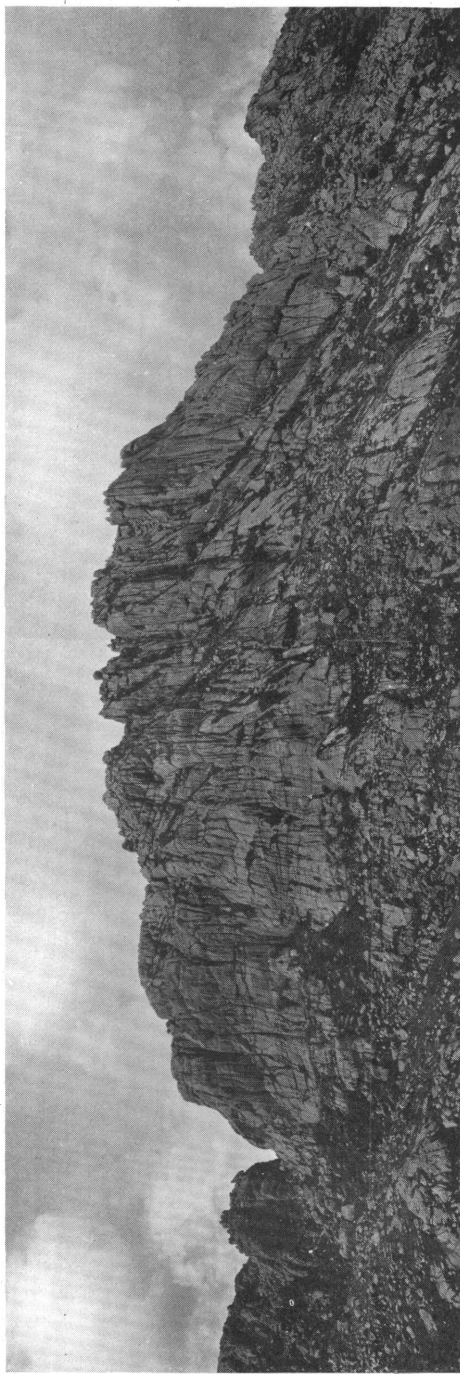


PLATE VII

Fig. 1. Prateleiras from the north.

Note barren slopes and peculiar weathering of rocks. The lakelet lies at 7800 ft. alt.

Fig. 2. Balanced rock on Prateleiras.

Fluting and exfoliation clearly illustrated. Alt. 7900 ft.

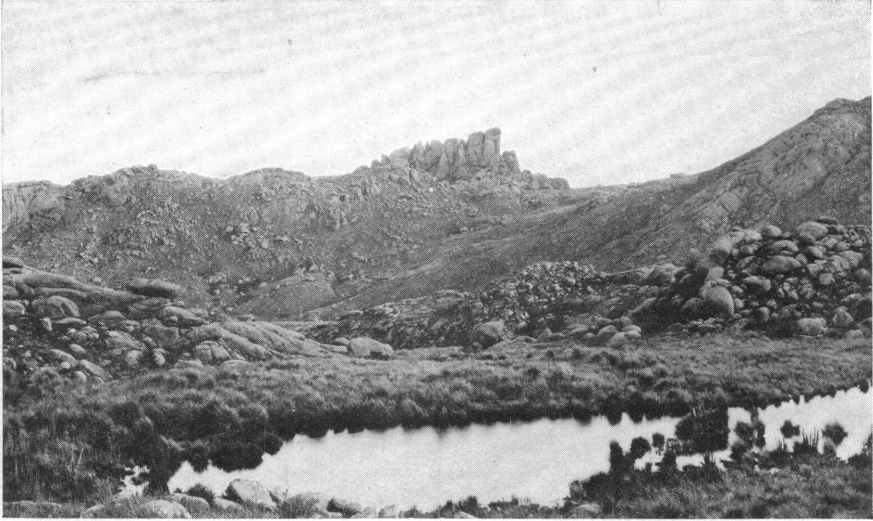


Fig. 1

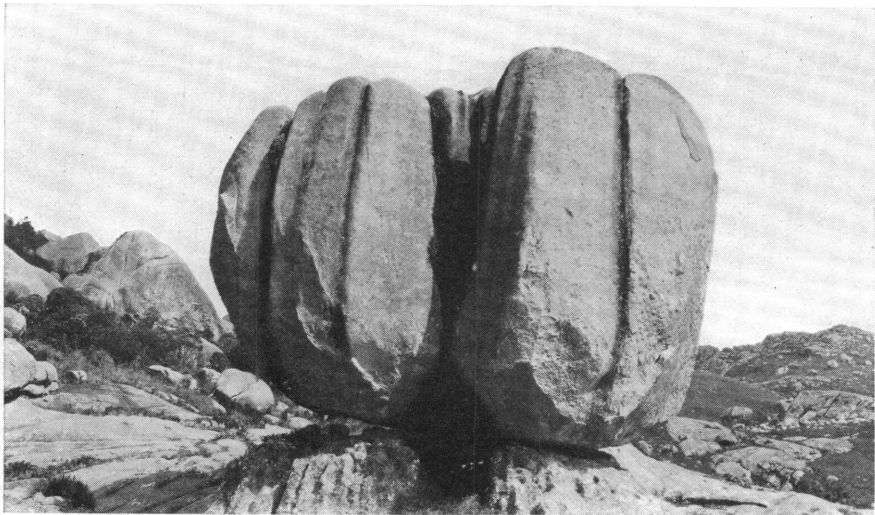


Fig. 2

PLATE VIII

Fig. 1. Serra do Itatiaya.

View north across the Parahyba River and Valley. The town of Campo Bello (center) lies at 1337 ft. alt.

Fig. 2. Monte Serrat.

Open slope beyond is covered with giant bracken—habitat of *Synallaxis s. spixi*. Altitude of houses 2700 ft. Paraná pines (*Araucaria*) at right.



Fig. 1

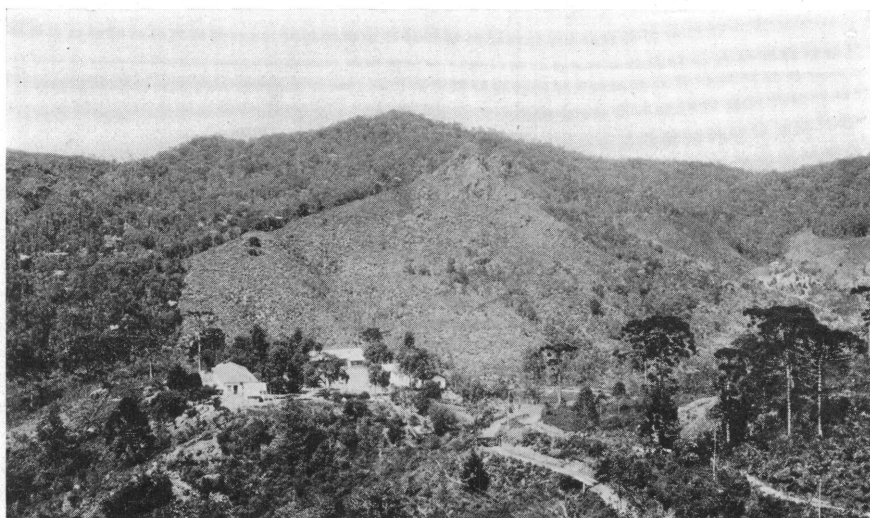


Fig. 2

PLATE IX

Fig. 1. Monte Serrat.

Looking S.S.W. over the Parahyba Valley to the Serra da Bocaina. Paraná pines in foreground are favorite resort of *Pyrrhura v. vittata*.

Fig. 2. Edible palm, *Euterpe edulis*, growing in cut-over forest at 3400 ft. alt.



Fig. 1



Fig. 2

PLATE X

Fig. 1. Reverted clearing.

A typical tangle, very attractive to birds, at 3800 ft. on the main trail. *Croton*, *Cecropia*, and vines predominate.

Fig. 2. Cañon of the Rio Campo Bello.

View N.N.E. over virgin forest from 4700 ft. on the main trail. Treeless summits of Temperate Zone in background.

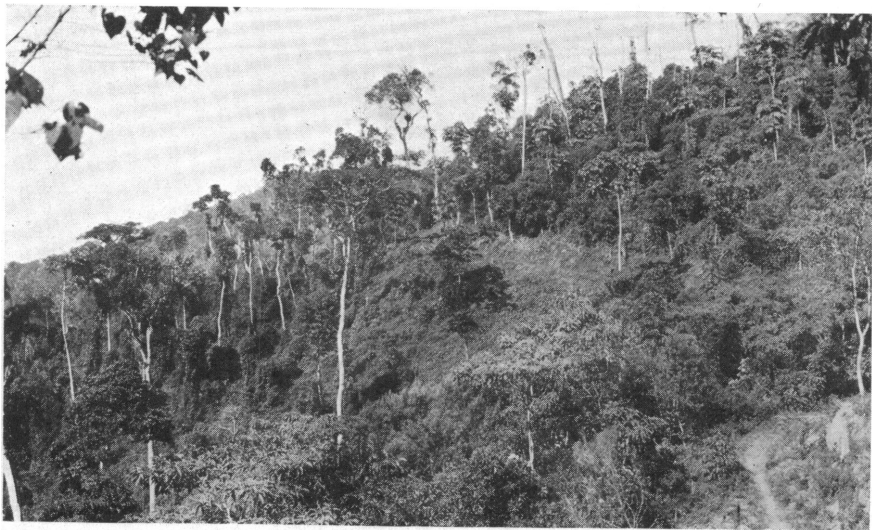


Fig. 1

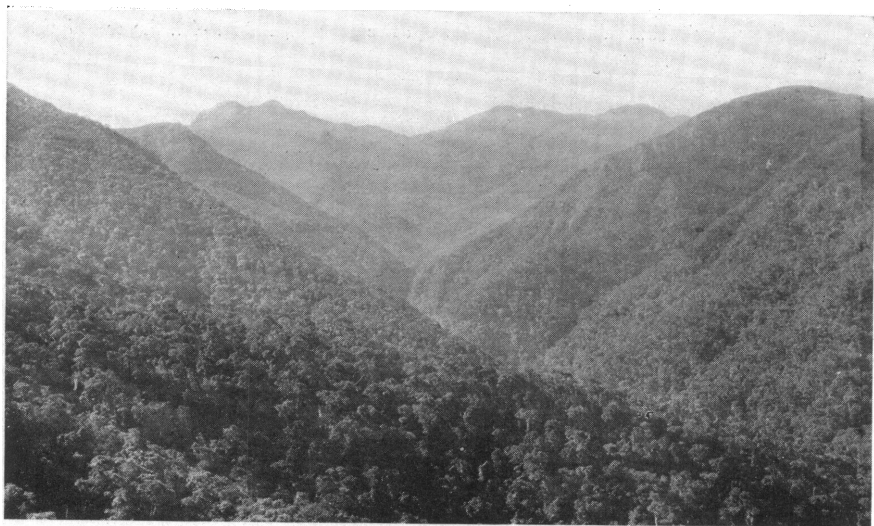


Fig. 2

PLATE XI

Fig. 1. Macieiras.

The mud hut at 6100 ft. Pear trees at left, apple trees at right, native growth in background.

Fig. 2. Upper Campo Bello Cañon.

Itatiaya Peak from S.E. The bottom of the cañon is 6100 ft. alt., the top of the peak nearly 9200 ft.



Fig. 1



Fig. 2

PLATE XII

Alto Itatiaya.

View west from 7300 ft. Clumps of *Xyris* in meadow, dwarf-forest copses in hollows, Serra do Picú in background. Terceiro Morro at left, Prateleiras and Pedra Assentada at right.



PLATE XIII

Fig. 1. Alto Itatiaya Meteorological Station.

Alt. 7150 ft. *Xyris* in foreground, dwarf-forest copses on the hill, Cabeça do Leão in the distance.

Fig. 2. Pedra Assentada.

View N.N.E. from 7400 ft. Bare rocky ridges with dwarf forest in the ravines. Summit is about 8150 ft. alt.



Fig. 1



Fig. 2

PLATE XIV

Fig. 1. Prateleiras.

View N.N.W. from 7400 ft. Height of peak about 8279 ft. Dwarf forest in foreground, Pedra do Couto in background.

Fig. 2. Detail of forest shown above.

Spaces between trees filled with dense growth of bamboo (*Arthrostylidium* and *Chusquea*)—habitat of *Scytalopus speluncæ* and *Drymophila genei*.

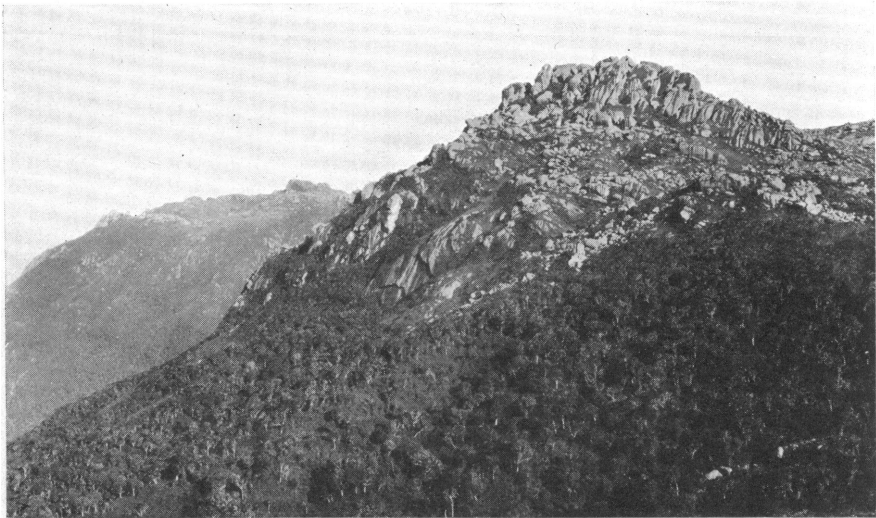


Fig. 1



Fig. 2

PLATE XV

Fig. 1. A highland meadow.

Alt. 7150 ft. Flowering shrub in foreground is *Symphyopappus*. Clumps of *Xyris* at right.

Fig. 2. Detail of meadow above.

Bunches of *Xyris* at left, *Baccharis discolor* at right. Alt. 7100 ft.



Fig. 1



Fig. 2

PLATE XVI

Fig. 1. Margin of a copse.

Habitat of *Synallaxis moreiræ*. Note epiphytes. Bunches of *Xyris* in foreground, *Symphypappus* at right. Alt. 7100 ft.

Fig. 2. Agulhas Negras.

View N.N.E. from 8000 ft. on Prateleiras. Dwarf forest ascends to about 7600 ft.



Fig. 1



Fig. 2

PLATE XVII

Fig. 1. Morro do Altar.

A good example of the rocky wastes about the summit of Itatiaya. Alt. 8650 ft.

Fig. 2. Alto Itatiaya.

An isolated tree on the *campo* and a patch of dwarf forest. Alt. 7100 ft. Serra do Picú in background.

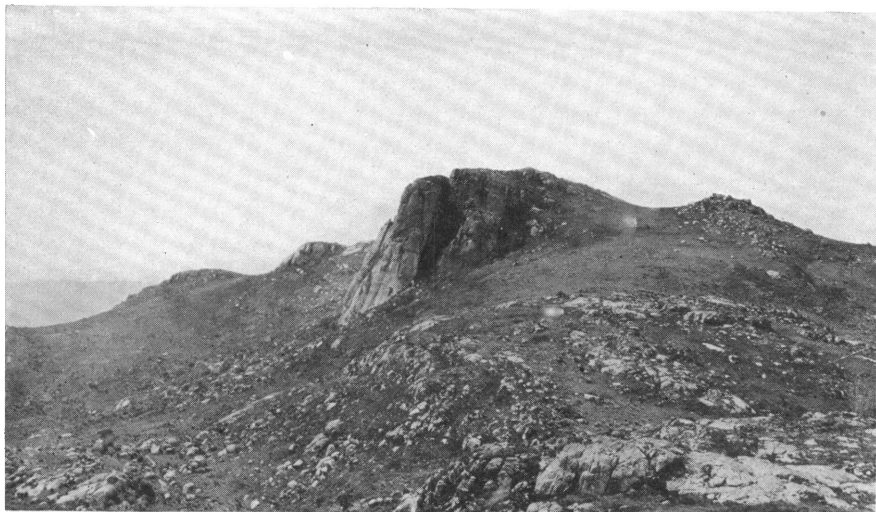


Fig. 1



Fig. 2

PLATE XVIII

Cabeça do Leão

N. E. × E. from 7300 ft. Note interdigitation of forest and *campo*.



PLATE XIX

Fig. 1. Morro Redondo.

Alt. 6875 ft. Type locality of *Synallaxis moreiræ*. Flowers in foreground are *Pæpalanthus polyanthus*.

Fig. 2. Morro dos Urubús.

Alt. 7225 ft. Breeding place of *Coragyps a. brasiliensis*. View west showing effect of fire on dwarf forest. Serra do Picú in background.



Fig. 1

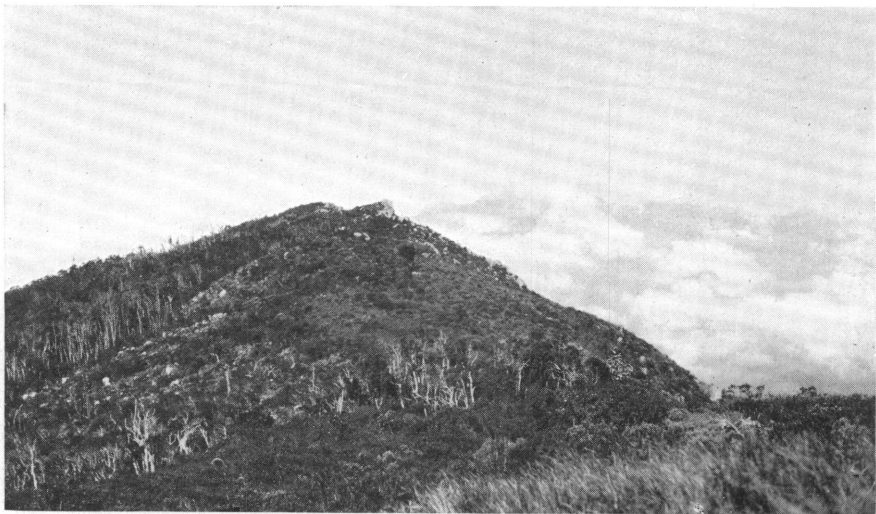


Fig. 2

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