LAGUNA DE NICARAGUA
Puerto de San Carlos
Castillo viejo
Rio Frio
V. la Vieja
Rincon de la Vieja
V. Miravalles
1410 F.
Cupilapa
GUATUZOS
El Muelle
Cerros de San Carlos
Tenorio
Bagaces
Cerros de los Guatuzos
Las Cañas
Rio Tempisque
Rio Piedra
Cerros de las Dantas
Cerros de la Trinidad
Isola de Chira
Nicoya - antigua
Peñon de la Bocana
I. del Venado
I. del Caballo
Punta Arenas
San Lucas
Calderas
Peñon de Calderas
Cedro I.
Las Negritos
I. Alcatraz
I. Jasper
Cabo de la Ballena
Bahia de la Ballena
R. Grande
Rio Grande
Puerto de Tarcoles
Pta. Sucia
Pta. de la Herradura
Puerto de Herradura
Esparza
San Ramon
Atenas
GOLFO DE NICOYA
EL NICOYA

CHAPTER 2

Orchid collecting in that rich coast

Carlos Ossenbach and Franco Pupulin

> *"Paradise for an orchid collector is a trail that runs through rich orchid habitat"*
>
> Calaway H. Dodson, in his foreword to Cribb's magnificent work on Friedrich Carl Lehmann[1]

One of the outstanding aspects of the collections made by Endrés in just a few years in the post-colonial Costa Rica of the Nineteenth century is his impressive knowledge of the country, in terms of geographical coverage. Several of the localities indicated by Endrés in his notes, or affixed to the dry specimens and drawings he regularly sent to his main correspondent, Prof. Reichenbach at Hamburg, were at that time at the extreme bounds of the known territories of a still unexplored country. Some of them correspond today to prosperous villages and towns, but they are recorded by Endrés just as the farms and hamlets, mines, pastures, trails, or simple sites, as they were at the time he visited these localities for the first time.

A brief review of Costa Rica's physical geography, weather, climate, and phytogeographical regions will show us that Endrés, the *skillful lynx-eyed investigator*, as Reichenbach described him, had not only an exceptional eye for rare plant novelties, but that he also had a sixth sense for knowing exactly where to travel during his collecting journeys, always choosing the country's richest orchid regions.

Costa Rica: physical geography[2]

> *"Why should so small an area possess such a vast number of plants, a number much greater than exists in any of the other Central American countries, most of which are much more extensive in area? Why should Costa Rica have such a stupendous number of ferns and orchids, groups of which few other tropical countries, no matter how great their area, can*

[1] Cribb, P. 2010. The orchid collections and illustrations of Consul Friedrich C. Lehmann. *Lankesteriana* 10(2-3): 1—217.

[2] The structure of this chapter and most basic information on Costa Rican physical geography, weather, climate, and vegetation, follows Hammel, B.E., Grayum M.H., Herrera, C. and Zamora, N., editors, *Manual de Plantas de Costa Rica*, vol. 1. *Monographs in Systematic Botany from the Missouri Botanical Garden*.

◂● Augustus Heinrich Petermann, 1861. *Originalkarte des nördlichen Theiles von Costarica, nach einer Original-Zeichnung / von Dr. A. v. Frantzius*. Gotha, Justus Perthes.

rival it?Why is it that in America such wealth of plant life can only be found in no other area of equal size, unless it be in portions of Colombia, Ecuador or Perú?These questions may be answered satisfactorily by an understanding of Costa Rican geography and climate."

Paul Standley in his *Flora of Costa Rica*[3]

Considering its small size, Costa Rica is extraordinarily diverse topographically. The landscape is dominated by a chain of four major cordilleras, which run from the northwest to the southeast, flanked on either side and to the north by lowlands studded with outlying peaks and ridges. These major cordilleras are the Cordillera of Guanacaste, extending from the border between Costa Rica and Nicaragua to the region of Cañas; the Cordillera de Tilarán, from the town with the same name to the Montes del Aguacate, between San Ramón and Atenas; the Cordillera Central, extending from Alajuela to the east of Turrialba, dividing the Central Valley from the northern lowlands; and the Cordillera de Talamanca, extending from Cartago southeastward into Panama. The Cerros de Escazú, which form much of the southern skyline of the Central Valley, may be viewed as a northerstern spur ridge of the Cordillera de Talamanca, connected to them by the Alto Tablazo and the Cerros de la Carpintera, on the Continental Divide.

"While upon the map one sees a neat chain crossing the country obliquely, in actuality this chain is much interrupted and bewildering complex in geography"[4].

The Central Valley, or Meseta Central (Central Plateau), flanked to the north by the Cordillera Central and to the south by the Cerros de Escazú and Tablazo, is a small area straddling the Continental Divide in the heart of the country, and ranging in elevation from ca. 700 to 1500 m. The Caribbean portion of the valley drains to the sea via the Reventazón River, while the Pacific portion via the Barranca and Grande de Tárcoles rivers. Over ninety percent of the country's population lived in this area at Endrés' time.

The Caribbean slope is drained by three major rivers. These are, from north to south, the San Juan River, along the border with Nicaragua, the Reventazón River, in the central part of the country, and the Sixaola River, at the Panamanian border. The San Juan River has the most extensive drainage basin, including the northern and eastern slopes of the Cordilleras of Guanacaste and Tilarán and most of the Cordillera Central. This basin forms the extensive lowlands to the north and north-east of Costa Rica, known as the Llanuras de los Guatusos, Llanuras de San Carlos and Llanuras de Sarapiquí.

Along the Caribbean coast, the Llanuras de Tortuguero extend from the San Juan River to Puerto Limón. South from Limón the coastal plain is very narrow. The Caribbean coastal plains are dotted with isolated hills and ridges up to several hundreds meters in height.

The Pacific slope lacks the broad coastal plains characteristic of the Caribbean slope. The basin of the Tempisque River, at the northern end of the country in the province of Guanacaste, is the most extensive lowland region on the Pacific side. In the Central Pacific region, several rivers flow from the western portion of the Central Valley and the southern slopes of the Cordillera Central, the most important being the Barranca, Jesús María and

[3] Standley, P.C. 1937. Flora of Costa Rica, Part I. Fieldiana. Botany series: 18.

[4] *idem*: 7.

Grande de Tárcoles rivers. A narrow coastal plain extends from the mouth of the Barranca River southeast to the Osa Peninsula, compressed between the Pacific Ocean and the Cordillera de Talamanca. Further south, the most important river system is that of the Grande de Térraba River, which – with its tributaries – drains the western slope of most of the Cordillera de Talamanca. Near the Panamanian border, a smaller system centering on the Coto Colorado River drains the waters of the southern Fila Costeña and the hills at the foot of the Burica Peninsula into the eastern side of the Golfo Dulce.

> *"Such, in brief, is the geography of Costa Rica. Land at either of its ports, but especially the Atlantic one, and look about you, and the geography seems far from simple. After spending a little time in the country, and trying to travel over it, even to the more accessible and populated regions, you will agree that practically the geography is highly complicated".*[5]

Costa Rica: climate and weather

Because Costa Rica is a relatively narrow isthmus and topographycally complex, it presents great climatric variation, often over small distances. As pointed out by Gómez P.[6], one of the driest sites in the country (El Guarco) ist just 18 km removed from one of the wettest sites (Tapantí) in the province of Cartago.

Average maximum temperatures at sea level are around 32°C on the Pacific side ant 29°C on the Caribbean coast. Maximum temperature in the Central Valley varies from ca. 23°C to 27°C, while average maximum temperature on Cerro Chirripo (3819 m), the highest peak of the country, is ca. 7°C. Frost is frequent at high elevations, however, there is no permanent ice and snow is officially unknown, notwithstanding apocryphal sightings on the highest peaks of the Cordillera deTalamanca.

Costa Rica, as all of Central America, has two distinct rainfall regimes. The Caribbean slope is, on the whole, more continuosly rainy, peaking from November through January. On the Pacific slope, the rainy season extends from April or May through November, with virtually no rain during the northern winter. On either slope, a brief, relatively dry period (*veranillo*) may ocurr at some point in the middle of the rainy season (July – September, depending on the site). In both Caribbean and Pacific rainfall regimes, March and April are always the driest and hottest months. The seasonal distribution of rainfall is probably more important for plants than the annual total[7]. The pronounced seasonality of the Costa Rican Pacific slope is presumably responsible for the diminished diversity of certain groups of plants –especially epyphytes-, even in areas with high annual rainfall. Local distribution of rainfall is profoundly affected by topographic factors, particularly the height and orientation of the mountan ranges, and the configuration of the coastline relative to the air-flow patterns of the season. In general, ridges are wet, lee sides of ranges are dry, and windward sides are much moister. The rainfall patterns in inland areas are a mix of the Atlantic and the

[5] *idem*: 6.

[6] Gómez P., L.D. (ed.). 1986. *Vegetación y clima de Costa Rica*. San José, Editorial de la Universidad Estatal a Distancia.

[7] *idem*.

Pacific regimes, with maximum rainfall on the windward sides of obstacles[8]. *"The mountains constituting the continental divide are the factor governing distribution of rainfall. During winter months they are an effective barrier against rain clouds driving inland from the Caribbean. These clouds are halted at the summits, but drift across upon the Pacific slope for a short distance. Ascending the Pacific slope of one of the central volcanoes during the winter, especially in early morning, it is easy to see how the moisture is distributed. On the lower slopes in March the fields are dry and brown, but at a certain level the dust in the road disappears, and the ground becomes progressively wetter and wetter. Immediately one notices that every tree is laden with orchids, ferns, and other epipythes. It is to this line that clouds descend at night."*[9]

Climate and weather not only affect vegetation type and the distribution of plant species, but also the phenology of leaf-flushing, flowering and fruiting. The most well-known patterns involve deciduous-forest trees that flower conspicuosly during the dry season, while leafless. This pattern is however not universal in Costa Rica. Species of Araceae often flower during the rainier months and some shrubs and small trees specialized in colonizing gaps appear to begin flowering when they reach a critical size and to continue flowering until they are shaded out. Flowering of other species is apparently linked to day-length, rather than rainfall.

Costa Rica: vegetation

Several authors (cf. Wercklé[10] and Standley[11]) have documented in detail the phytogeographical relation betweenthe vegetation of Costa Rica and that of South America, especially the northwestern part of Colombia and the Pacific coast of Ecuador. Wercklé, in fact, described the flora of Costa Rica as *"an outpost of the northern equatorial flora in the continent of the North"*[12]. Reichenbach, in the introduction to his account of new discoveries of orchids by Lehmann, had already discovered that *"there seems to be a remarkable harmony between the orchid floras of Costa Rica and Ecuador. This is evident from a comparison with Endrés' orchids"*[13]. Pittier[14] recognized three altitudinal belts: a basal zone from sea level to 1,000 m; an intermediate or mountainous zone from1,000 to 2,600; and a superior or Andean zone above 2,600 m. Wercklé described four regions: Atlantic or Caribbean region from sea level to 800 m; Pacific region from sea level to 800 m; temperate region from 800 to 1,500 m; and cold region above 2,000 m. Standley followed Wercklé's phytogeographic divisions, but stated that the cold region must be subdivided into lower and upper belts, and was the first to point out the difficulty of assigning a single altitudinal limit to a particular type

[8] Coen, E. 1983, *Climate*. Pp. 37-38 *in* D. H. Janzen (ed.), *Costa Rican natural history*. University of Chicago Press, Chicago.

[9] Standley, P.C. 1937. *Op. cit.*, p. 9.

[10] Wercklé, C. 1909. *La subregión fitogeográfica costarricense*. San José, Ministerio de Fomento, Sociedad Nacional de Agricultura.

[11] Standley, P.C. 1937. *Op. cit.*

[12] Wercklé, C. 1909, *op.cit.*, p. 5.

[13] Reichenbach, H.G. 1878(b). Orchidaceae F. C. Lehmannianae ecuadorenses. *Otia Botanica Hamburgensia* 1(1): 3-31.

[14] Pittier, H. 1957. *Ensayo sobre las plantas usuales de Costa Rica*, pp. 29-33. Washington, H.L. & J.B. McQueen.

of vegetation[15]. Holdridge's dissatisfaction with existing vegetation classification systems led to the development of a new system[16] that has been extensively used in Latin America to preapre ecological maps. Holdridge's system gives first importance to temperature and rainfall and the seasonal variation and distribution of these two climatic parametrers as the primary determinants of the world vegetation. The bioclimatically defined units are called Life Zones. Twelve of these Life Zones occur in Costa Rica and we will use their definitions, as explained by Holdridge and collaborators[17] to characterize the regions through which Auguste R. Endrés travelled while pursuing his unfulfilled dreams of fame and fortune. One should however take Dressler's words in earnest consideration, who warns that *"one must emphasize that there is a spectrum of vegetation types and that each plant species has its own range of tolerance and requirements, which rarely correspond exactly to a life zone. Any attempt to map or characterize vegetation types in detail will be frustrating, if not misleading."*[18] We will therefore, in the following pages, fall back now and then to the older definitions of vegetation zones, as defined by Pittier, Wercklé and Standley. Thus, we believe, will the reader have a more comprehensive overview over Costa Rica's phytogeographical characteristics.

The orchid itineraries of Auguste R. Endrés in Costa Rica and Panama

It is interesting that Endrés' first impression of Costa Rica was that *"it [...] would be a useless waste of time and labor to collect anything here"* as he wrote to Dow[19].He was under the impression that the collectors who had visited the country before him had already taken *"all that could be found within the country"*. It is fortunate that he apparently changed his mind. In the years to come, Endrés traveled throughout Costa Rica, reaching every region that was accessible at that time (FIG. 61-66). The exceptions where the Northwestern regions (the westernmost part of the province of Alajuela and the region of Guanacaste), where orchids were large in quantity but small in diversity (and thus of little interest to Endrés), and the Pacific and Atlantic coastal regions of Southeastern Costa Rica, practically inaccessible at that time and only partially surveyed during the last two decades of the 19 century by explorers like the American geologist William Gabb, Archbishop Bernard A. Thiel, and the Swiss naturalist Henri Pittier. One of the smallest Central American countries, Costa Rica had in 1868 just about 128,000 inhabitants[20]. Large portions of the country were still covered by virgin forests that were fertile ground for plant collectors. As an example, Endrés wrote on one of his herbarium specimens, that it could be found *"by thousands, north of Santa María."*[21]

[15] Hartshorn, G.S, 1983. Plants. Pp. 118-157 in: D. H. Janzen (ed.), *Costa Rican natural history*. University of Chicago Press, Chicago.

[16] Holdridge, L.R. 1947. Determination of world plant formations from simple climatic data. *Science* 105(2727): 367-368.

[17] Holdridge, L.R., W. C. Grenke, W. H. Hatheway, T. Liang & J. A. Tosi Jr. 1971. *Forest environments in tropical life zones: A pilot study*. Pergamon Press, New York.

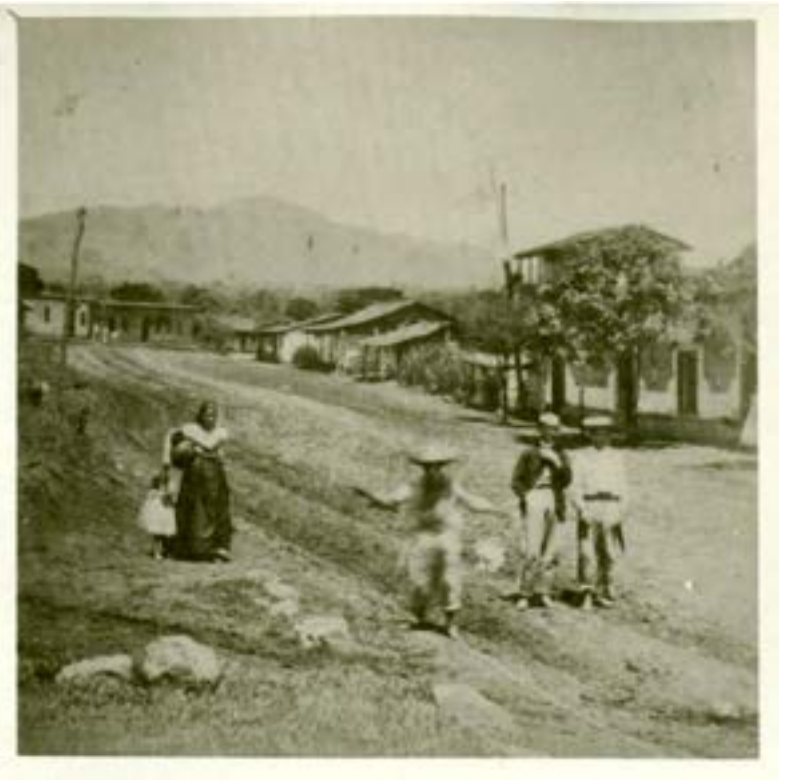
[18] Dressler, R.L. 1993. *Field Guide to the Orchids of Costa Rica and Panama*, p. 6. Cornell University Press, Ithaca.

[19] Letter to Capt. Dow, dated in San Jose, May 25th, 1867. Cornell University.

[20] Paniagua, 1943. *Apuntes Históricos y Crónicas de la Ciudad de San Ramón en su Centenario*, p. 44.

[21] *Ornithidium* sp., W 0018715.

A



B

Figure 61. Otto Siemon, 1873. A) Road entering the village of Atenas. B) Bridge of mules. Road of San Antonio de Belén. Costa Rican Libraries System and the Costa Rica National Library.

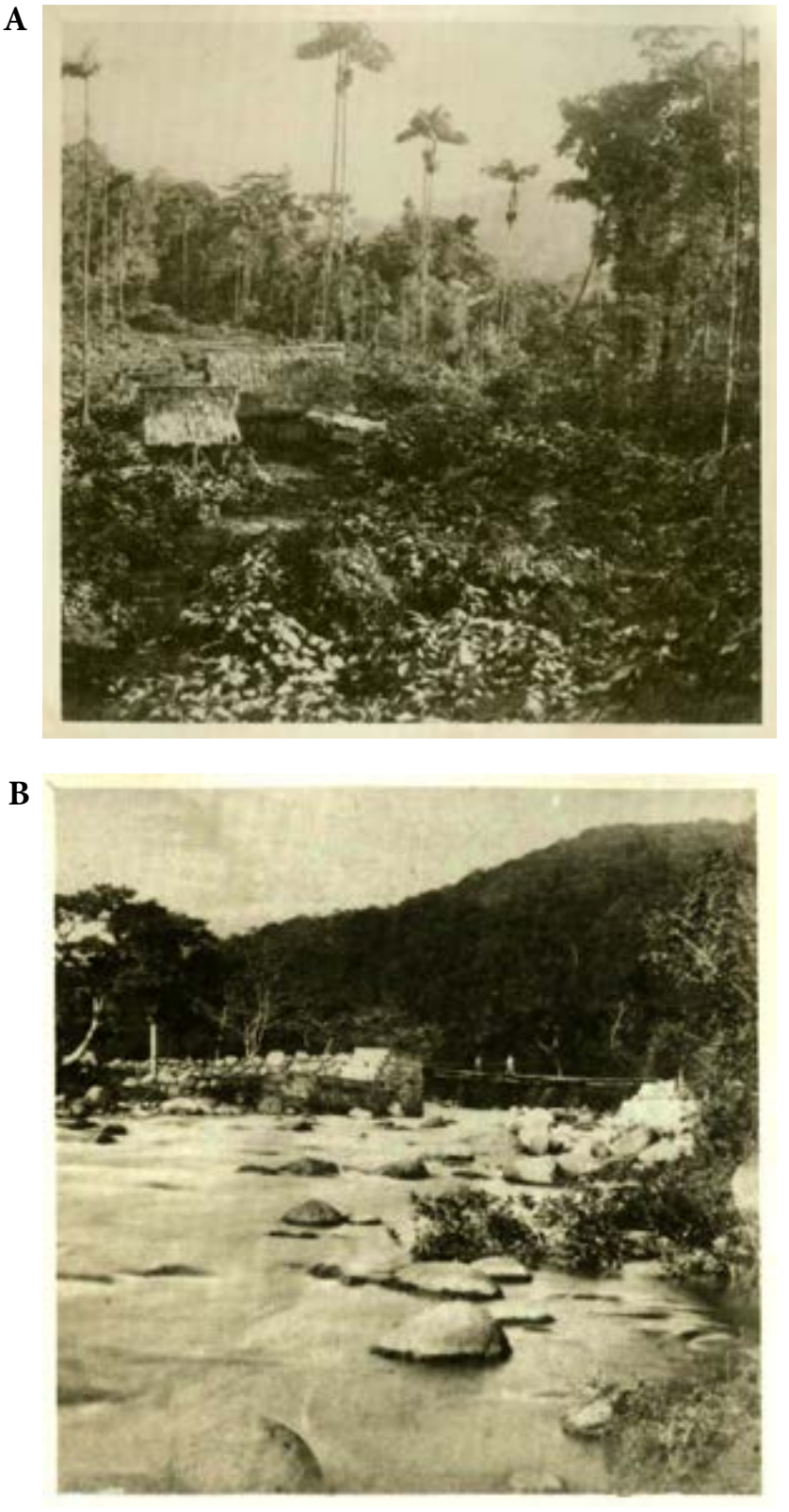


Figure 62. Otto Siemon, 1873. A) Road to the North, Soledad. B) Suspension bridge over the Río Navarro, road to Orosi. Costa Rican Libraries System and the Costa Rica National Library.

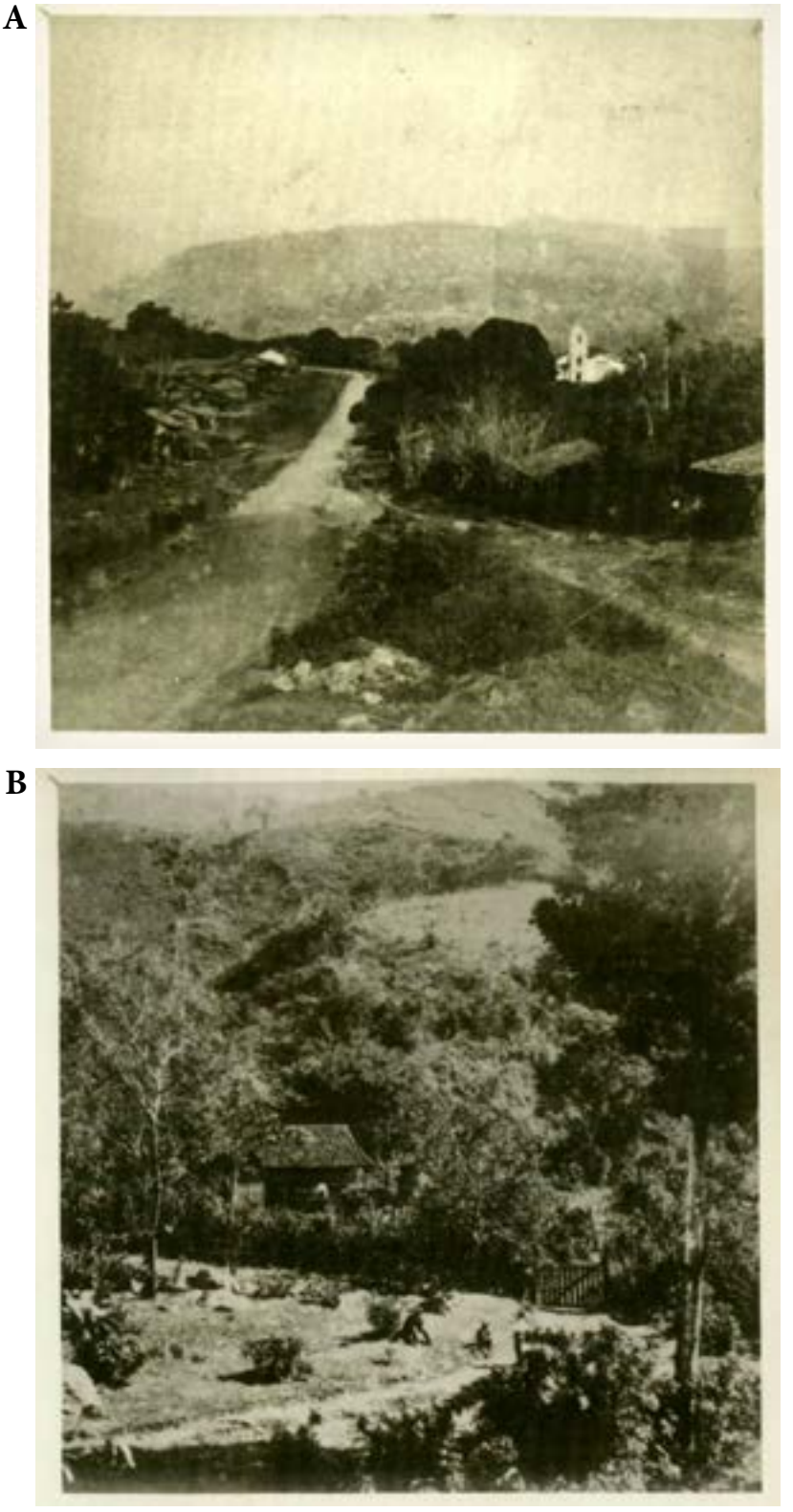


Figure 63. Otto Siemon, 1873. A) View of the entrance to San Mateo. B) View of the Cacao River. Costa Rican Libraries System and the Costa Rica National Library.

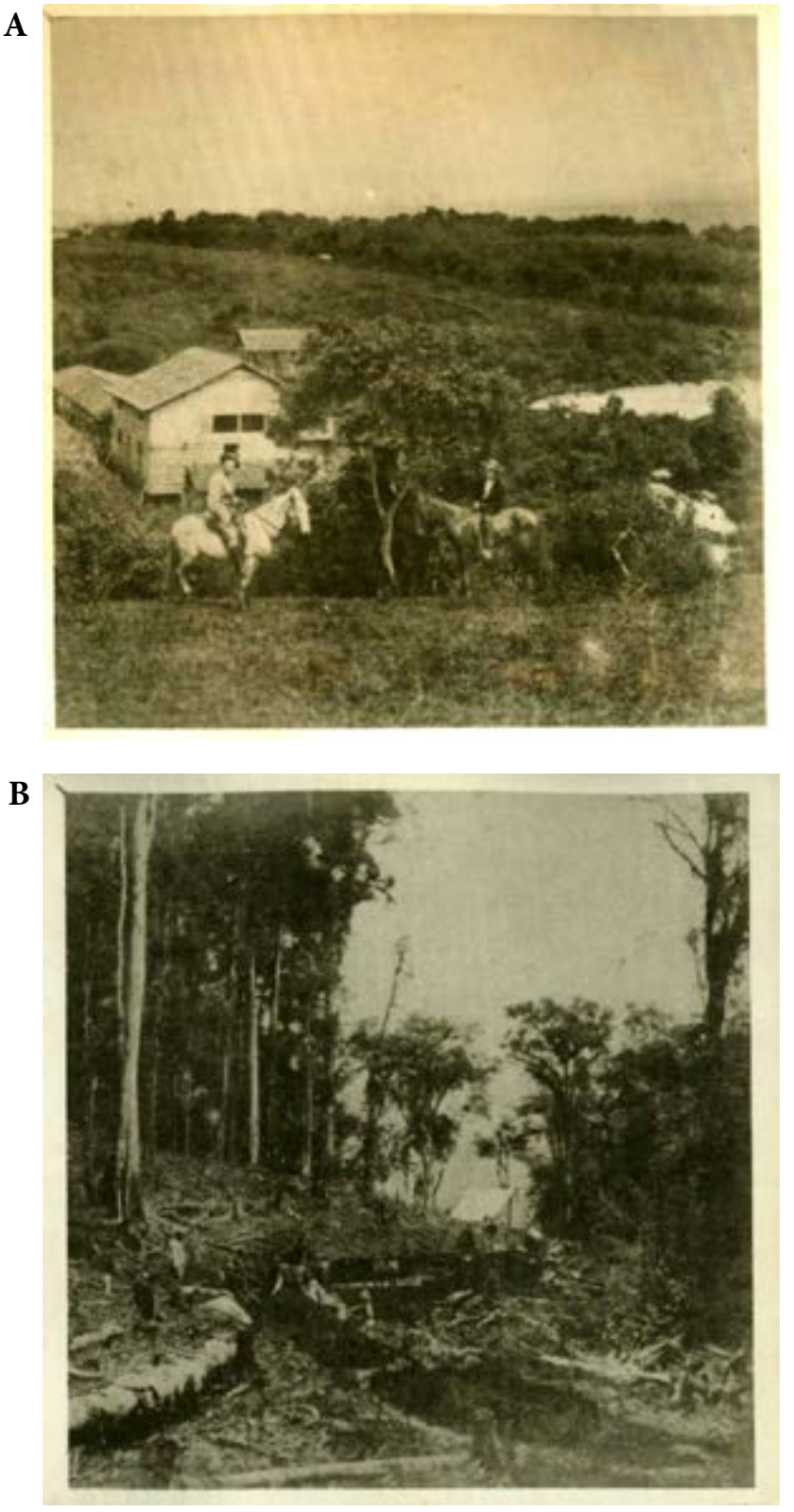


Figure 64. Otto Siemon, 1873. A) View of the vicinities of Barva. B) Road to the North, Calvario. Costa Rican Libraries System and the Costa Rica National Library.

A

B

Figure 65. Otto Siemon, 1873. A) Market day in Cartago. B) Bridge over the Río Virilla. Costa Rican Libraries System and the Costa Rica National Library.

B

Figure 66. Otto Siemon, 1873. A) Río Reventazón valley, near Ujarrás. B) La Unión, Tres Ríos. Costa Rican Libraries System and the Costa Rica National Library.

The 'far' Northeast and the road of Sarapiquí

After arriving in Greytown, Endrés spent several months in the Atlantic region of Nicaragua and Costa Rica. According to undocumented reports, Endrés settled temporarily with English and German colonists along the San Carlos and Sarapiquí rivers[22]. There he worked at least part-time with a Mr. Koschny in beginning a plantation of native rubber and nutmeg. The port of Greytown, and the rivers San Juan and Sarapiquí were part of the "road of Sarapiquí", at that time the only route connecting the highland valleys of Costa Rica and the Caribbean coast. Travelers embarked in Greytown on primitive canoes and after navigating the treacherous sandbars on the mouth of the San Juan went up the river and continued into the Sarapiquí until they reached the village of El Muelle, the only available river landing on this stream (FIG. 67). From there, on foot and on mules, travelers took the trail to the villages of La Virgen and San Miguel through virgin forests and climbed over the mountain pass of El Desengaño, descending from an altitude of almost 3,000 m to Costa Rica's Central Valley and the country's capital, San José. Only passable during the dry season, the road was equally important to travelers and for the import of goods into the country. Costa Rica's first piano and first printing press came into the country via Greytown and Sarapiquí. The first notice of this route dates back to 1620, when Diego de Mercado, at the request of the Spanish authorities, who were interested in finding a way between the Atlantic and the Pacific because of the insalubrity of Panama, submitted a report to the government in Guatemala in which he stated that he had found the desired communication along two different routes. *"The first one navigating upstream along the 'Desaguadero'*[23] *to the mouth of the Sarapiquí, then upstream for more than twenty leagues and from that point to the Royal Embarkment (the mouth of the Tempisque River on the Pacific coast). The road was of 'hard earth and not marshy' … "* The other route consisted in what was later known as the Nicaragua Canal, sailing the San Juan River upstream to the Lake of Nicaragua and building from there a canal to the Pacific Coast[24].

Shortly after Costa Rica's independence from Spain in 1821, Richard Trevithick (1771–1833), a British inventor and mining engineer, whose most significant success had been the high pressure steam engine and the first full-scale working railway steam locomotive, arrived in Costa Rica hoping to develop mining machinery. He spent time looking for a practical route to transport ore and equipment, settling on using the San Juan River, the Sarapiquí River, and then a railway to cover the remaining distance. Trevithick had in mind a steam-driven and not a mule-driven railway. After almost loosing his life along the route, Trevithick abandoned the idea in 1827, returned to England and never came back to Costa Rica[25]. The road of Sarapiquí lost importance against the route from Costa Rica's Pacific port of Puntarenas to Panama and Colón once the railroad across the Isthmus of Panama was inaugurated in 1855.

[22] Luis Diego Gómez, pers. comm., 2008.

[23] = the Drainage, or the San Juan River

[24] Secretaría de Gobierno, 1924. *Guanacaste - Libro conmemorativo del Centenario de la Incorporación del Partido de Nicoya a Costa Rica - 1824-1924*.

[25] Gutiérrez Braun, H. 1981. *La ingeniería en Costa Rica 1502-1903*, Editorial Tecnológica de Costa Rica, Cartago.

↤ Figure 67. Confluence of the San Juan and Sarapiquí Rivers. In Vargas, 2008.

A more easterly route to the road of Sarapiquí was built in 1880, which communicated San José with the Sucio River and joined there the new railroad to Port Limón. It was named the 'road of Carrillo', in remembrance of President Braulio Carrillo (1800-1845) who had first envisioned the need for better communications with the Atlantic region. Finally, the railroad between San José and Port Limón was completed in 1890. However, the road of Sarapiquí, expanded in the early 1900's for the circulation of motor vehicles, remained the most important access to Costa Rica's Atlantic region until the late 1960's, when the present roads to Port Limón (the first over Turrialba and Siquirres and the latest over the Zurquí tunnel) were inaugurated.

Endrés first known orchid collection in Costa Rica, a specimen of *Dichaea trulla*, carries the date "1866"[26] and was undoubtedly collected in the Caribbean watersheds of the Sarapiquí and San Juan rivers, where still today this species is fairly common. There is no mention of other plant collections by Endrés along the "road of Sarapiquí", but we know that he arrived in San José on May 25, 1867, after following this route.

The northeastern regions delimited by the San Juan River to the north, the Sarapiquí River to the west and the Caribbean to the east, correspond to the "Tropical Wet Forest", and "Tropical Premontane Wet Forest" as defined in Holdridge's system of Life Zones. The first is defined as *"a tall, multistratal, evergreen forest. A few canopy species may be deciduous, but this does not change the overall evergeen aspect of the forest. Canopy trees*

[26] W 0019163 (*Rchb Orch* 18037).

are 45-55 m tall… ; sub-canopy trees ares 3-40 m tall…, and understory trees are 1-25 m tall…. Shrub layer is 1.5-2.5 m tall with abundant dwarf palms; unbranched treelets and giant broad-leaved herbs are ocassional…. Tropical Wet Forest is the most species-rich Life Zone in Costa Rica."[27] The second, a transition to somewhat higher elevations, is similar in tree strata to the first one, with somewahat smaller trees. Epiphytes are present but not conspicuous. While ascending the northern slopes of the Cordillera Central, Endrés entered the "Tropical Premontane Rain Forest"and the "Tropical Lower Montane Rain Forest", again following Holdridge's definition. Both are evergreen forests, with two or three strata, varying in tree height, which is 30-40 m tall in the lower regions, and becomes gradually smaller as the trail ascends to the lower montane areas. Understory stratum is often dense, with trees from 15-25 m and 10-20 m height, depending on site elevation. *"Epiphytes, woody wines, and herbaceous climbers are very abundant. Moss and epiphytes cover practically all surfaces."*[28] Finally, while crossing the Pass of Desengaño, between the Poás and Barva volcanoes, Endrés traveled through the "Tropical Montane Rain Forest", again an evergreen forest with two strata, and canopy tress of 25-30 m height. *"Tree ferns are common in the understory. The shrub layer is dense, with dwarf bamboos up to 5 m tall… Trunks and branches of trees are thickly covered with moss and small herbaceous epiphytes; orchids and ferns are common in the moss."*[29]

The 'near East': the road to Turrialba, the Turrialba volcano, Turrialba and surroundings (1867 and second half of 1872)

The region of Turrialba was the first to be explored in Costa Rica by Endrés after he had decided to settle in Costa Rica. As he wrote to Spencer F. Baird, "*In June 1867, I left a jar of Hummers* [=hummingbirds] *preserved in spirits, at the "Angostura… "*[30]. He referred to the small village of Angostura, just East of the city of Turrialba, and to his activities as collector of birds, which he alternated with his main objective, the orchids.

He would return to the area some years later. In a letter to Dow he wrote that he had *"lately scaled the Volcan de Turialba"*[31] (FIG. 68). It is probable that this excursion to the volcano was part of his failed excursion to Talamanca, which took place in May of 1872. Also possible is that Endrés stayed on that occasion (May-September 1872) for a longer period of time in the area of Turrialba, traveling and collecting in the neighborhood of that city.

On his way to the volcano, Endrés must have stopped at the house of Eusebio Ortiz, a place which he had visited before and that is mentioned frequently on his herbarium labels, described by Endrés as follows: *"Sitio*[32] *de Eusebio Ortiz. Southwestern slopes of Vulc. Turialba.*

[27] Hartshorn, G.S. 1983. *Op. cit.*, pp. 122-123.

[28] *idem*, pp. 124-125.

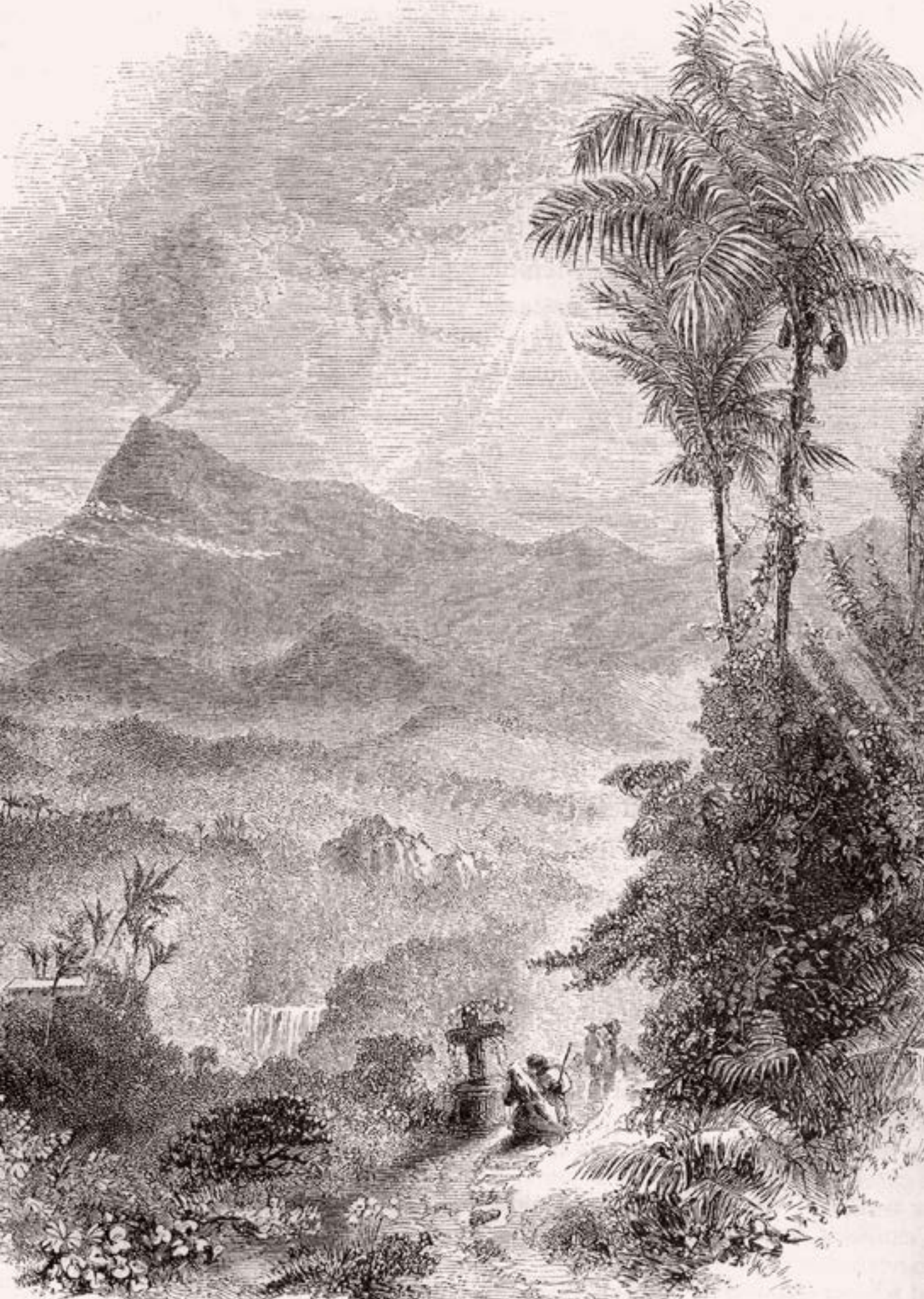
[29] *idem*, p. 125.

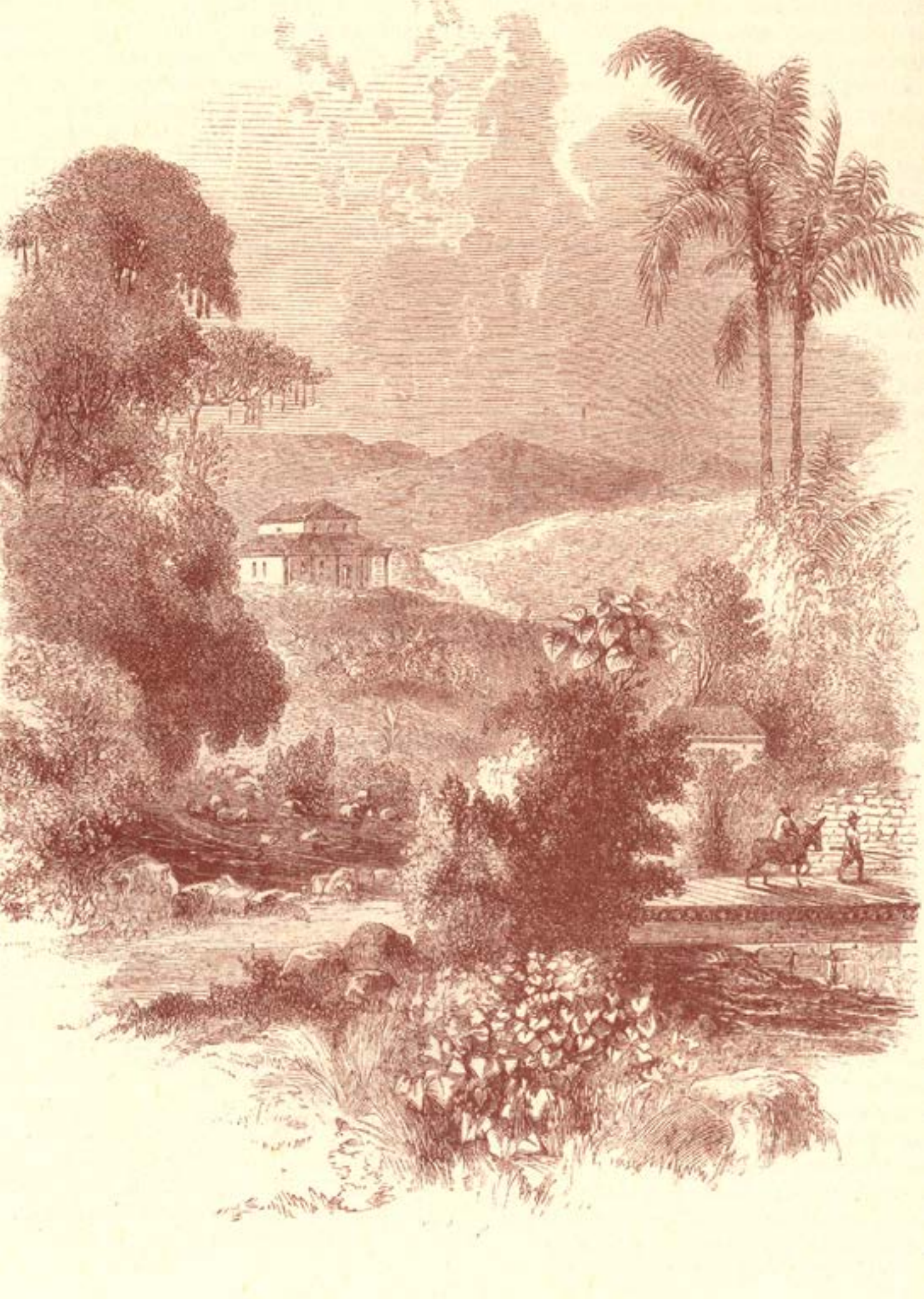
[30] Letter to Prof. Baird, Jan. 23, 1869. Cornell University, Ithaca.

[31] Letter by Endrés to Capt. J. M. Dow, dated Dated 27 September, 1872. Cornell University, Ithaca.

[32] = site.

↩ Figure 68. View of the Turrialba Volcano. In Vargas, 2008..





Road from Cartago to Turialba. After crossing the river Birris, where the same gentleman possesses a saw-mill, one takes the cuesta[33] *(Iglesias' new road) and before reaching the height, follows on the left until reaching the Potrero*[34] *where a house is found at a altitude of about 5,000 feet"*. On the road from Cartago to Turrialba, Endrés collected in Paraíso, Cervantes, Birrís, Quebrada Honda, Naranjo, Juan Viñas, Chiz and Colorado. To the North of Turrialba he names Guayabo. To the Southeast we have seen labels from Atirro, Angostura (where he probably stayed at the house of the German teacher Karl Lammich[35]) and Bóveda. And to the South and Southeast he was in Pejibaye, Azul and Tucurrique.

The region of Turrialba and surroundings falls mostly into Holdridge's "Tropical Moist Forest", which is described as a tall, multistratal, semideciduous or evergeen forest, with canopy trees 40-50 m tall, unbranched for 25-35 m. Subcanopy trees are upto 30 m tall, and understory trees uo to 8-20 m. The ground layer is generally bare except for occasional ferns. Herbaceous vines and woody lianas are abundant, as are epiphytes[36]. The road from Cartago into the Turrialba Valley corresponds to the "Tropical Premontane Wet Forest", highly variable zone in altitudinal terms, already described for the initial, north-eastern slopes of the Cordillera Central. The area aroud the summit of Turrialba Volcano corresponds to the already described "Tropical Montane Rain Forest", which was first encountered by Endrés when crossing the Cordillera into the Central Valley in May of 1867.

The 'far' East: the Atlantic Region (May 1872)

Endrés excursions to the Atlantic region had probably the city of Cartago as their point of origin, and were related to the construction of the railroad from San José to Port Limón (FIG. 69). In October of 1872 Endrés wrote to Dow about his intention of forming a collection of plants with the help of Wilhelm Nanne (then in charge of the construction of the railway) and said he hoped that *"he may give the necessary instructions to his staff of engineers for the purpose"*[37]. Endrés was also offered to take part in the exploration by W.M. Gabb[38] of the region of Talamanca *"for the purpose of working out a report on the vegetation of the eastern coast"*. And speaking of Talamanca, he wrote that *"Last May* [1872] *already, I started in that direction but was dissuaded before I reached Limon"*. It was undoubtedly during this excursion that he met Georg Müllner at his Hacienda Caño Seco, and Müllner's hospitality which earned him the dedication

[33] = steep incline of a road.

[34] = pasture.

[35] Lammich had arrived at Angostura as part of the group that attempted to establish a German colony under the direction of Baron Alexander von Bülow. The attempt ended in 1854 as a total failure and most Germans abandoned the area, but Lammich stayed behind and lived for years at Angostura.

[36] Hartshorn, G.S. 1983. *Op. cit*., pp. 121-122.

[37] Letter to Dow, October 18, 1872. Cornell University.

[38] William M. Gabb (1839-1878) was an American geologist who was hired in 1873 by Minor Keith, the builder of the railroad to Limón, to explore the region of Talamanca in search of the legendary gold mines of Río la Estrella and Tisingal.

◂● Figure 69. Hacienda in Navarro, along the road from Cartago to Turrialba.

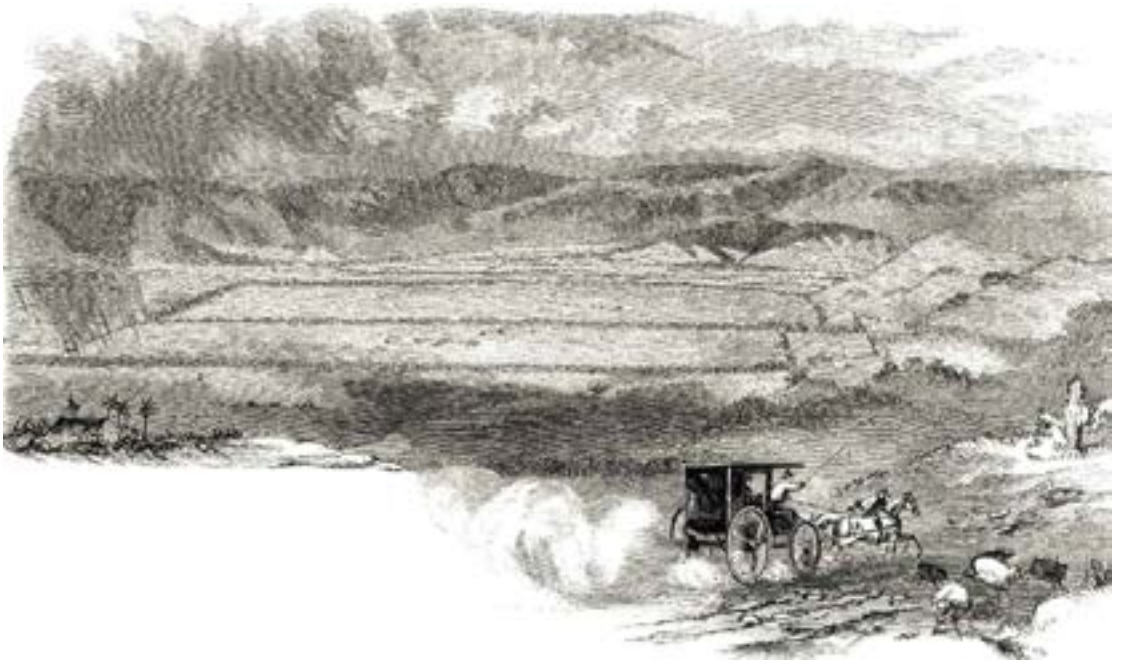


Figure 70. The valley of Cartago. In Vargas, 2008.

of *Lepanthes muellneriana* (an unpublished name by Endrés for *Lepanthes candida*)[39]. Müllner and his partner, another German by the name Schäfer, had occupied important positions in the railway company[40] and it is therefore probable that it was Nanne, who was directing the construction of the railway, who referred Endrés to Caño Seco. Nanne was rewarded with the dedication by Endrés of *Lepanthes nanneana* (a manuscript, unpublished name for *Lepanthes bradei*).[41]

It was in preparation of his excursion to Talamanca that Endrés read Valentini's manuscript about the discovery and conquest of the Atlantic region of Central America.[42] A reference to this work is given by Endrés in his 'Notizbuch II'.[43] Endrés extracted from this manuscript a vocabulary of words of the Bribrí language (spoken by the natives of Talamanca), with its translation into German.

Several specimens of *Ionopsis*, one of them bearing the label *'Common in Atlantic coast betw. Pacuare & Matina in the Cacao haciendas del "Bejuco"'* were collected during that excursion[44]. Moreover, many of his collections on the route from Angostura to the Atlantic ocean are labeled "May", which is coincident with the indication in the above mentioned letter. Finally, in his letter to Endrés of October1872, Captain Dow wrote: *"I am also glad to hear you have got some first [orchids] from the rivers of the eastern slope of the Cordillera"*.[45] Molina, in 1851,

[39] W *Rchb-Orch* 007618/W0019675.

[40] Bovallius, C. 1974. *Viaje por Centroamérica, 1881-1883*. Nicaragua, Banco de América.

[41] W *Rchb-Orch* 007620/W0019685.

[42] Valentini, F. J. J., 1869, Castilla de Oro –1502-1602 –Estudios históricos sobre el descubrimiento: Conquista del Istmo de Darién, Veragua, Costa Rica, Nicaragua y Honduras. San José, Costa Rica. Unpublished manuscript.

[43] Endrés, A.R. 1870. Archives of the Viena Natural History Museum.

[44] W *Rchb-Orch* 035959/W0019741.

[45] Letter to Endrés, October 13, 1872. Cornell University.

had described the road to Matina as "extremely laborious", having to pass through large rivers without bridges, and large swamps. One had to rent horses in Cartago (FIG. 70) and ride through Turrialba to the Matina river, and took boats from there to the mouth of the river on the Atlantic shore. The journey took almost a whole month. [46]

Although the locality of Fajardo (near Ujarrás, on the Reventazón River) lies on the original route which was proposed for the railroad, we do not know if Endrés' orchid collections in that area (Fajardo, Ujarrás, Orosi) were made during the excursion sponsored by W. Nanne or on a different occasion. Let us remember that the railroad was originally planned to run along the Eastern bank of the Reventazón, but the rocks of Fajardo proved to be an insurmountable obstacle. The route was afterwards changed to the Western bank of the river, running from Cartago to Cervantes, Juan Viñas and Turrialba.

Again, "Tropical Premontane Wet Forest", as defined by Hodridge, is the best characterization for this region.

A layman may form a clearer image about the former described regions if we follow the much broader definition of plant distribution zones used by Pittier, Wercklé, and Standley in the first half of the XX century, which gave a stronger emphasis on geographical characteristics. Thus, the first three of Endrés' orchid itineraries –with the exception of the higher slopes of the Turrialba Volcano- would fall into the "Atlantic Tierra Caliente", best translated as "Atlantic Hot Land", whose upper limit was placed by Pittier at 1,000 m and by Wercké and Standley at 800 m elevation.

> *"The whole Atlantic slope of Costa Rica, from the sea to the top of the mountains,except where cleared for cultivation, is occupied by dense rain forest of the type prevalent from southern Mexico almost continuously along the Central American coast, and far southward, at least to the mouth of the Amazon. If viewed from an airplane, nothing would be seen but a monotonous expanse of green, everywhere almost uniform in height, broken only by isolated peaks, and varied but slightly by lower mountains and hills. … The landscape of the tierra caliente is monotonous, even to a botanist. To others uninterested in vegetation it must seem even less varied, for the view consists of little but forest, interrupted by an occasional glimpse of a swift stream… Entering this forest afoot or on horseback, the first feeling is one of bewilderment. One recalls the old remark about being unable to see the forest for the trees, a statement that here, especially for the botanist, is all too literally true. You are in a forest, with trees on every hand, but all you can discern in any direction is tree trunks and more trunks. You can not even guess at what they may be. For most botanists, unfortunately, tree trunks have little significance… An important element in these forests consist of epiphytes. From the ground you can see the coarser ones, festooning the trunks of almost every tree with rope-like stems ans cloaks of huge leaves. On a recently fallen tree you will discover a host of others that are invisible from the ground. Some of the more freely branched trees support dozens of epiphytic species, ranging in size from minute lichens and hepatics to the largest aroids."*[47]

[46] Molina, F. 1851. *Bosquejo de la República de Costa Rica seguido de Apuntamientos para su Historia*. New York, Imprenta de S. W. Benedict.

[47] Standley, P.C. 1937. O*p. cit.*, pp. 11-15.

South and Southeast of Cartago, the ascend to the Páramo de Vueltas (also called Páramo de Dota) and Cerro Buena Vista, and the road to Térraba.

There were two routes into the Talamanca mountain range. The first went from San José through Desamparados and Aserrí to Frailes, and from there to Boca de Dota (named also Atarrazú, today the city of San Marcos de Tarrazú). In Tarrazú there is frequent mention by Endrés of the "savannas of Ramón Zúñiga". Ramón Zúñiga Barahona had been one of the founders of the village and probably another of the many people whose hospitality was enjoyed by Endrés during his travels. Santa María de Dota was founded somewhat later by settlers who came from Tarrazú and from there a road was built to the hamlet of Copey.

The second route started from Cartago, and went through El Tejar (here Endrés mentions the lime-kilns of Ana Cleta Mayorga[48]) to Tobosi, Palo Blanco, Copalchí, Pizirres (where he stayed at the house of Rafael Calderón), Corralillo, San Cristóbal, los Frailes and Copey.

From the indications on his herbarium sheets, it seems that Endrés traveled both of the routes to the region of Dota. From the first, Endrés recorded *Masdevallia* (= *Scaphosepalum microdactylum*[49] and *Trichocentrum saundersianum*[50] (= *Trichocentrum pfavii*), while from the route to Copey he gathered *Ponera fastuosa* (= *Scaphyglottis pulchella*)[51] and *Platystele propinqua*[52].

From Copey, Pedro Calderón started, in 1866, to explore a trail across the mountains, trying to reach the Valley of El General and the region of Térraba. Calderón, a native of San Ramón, was accompanied by his son-in-law Juán López. While Pedro Calderón spent months at a time in the mountains, his son-in-law returned every three months to San Ramón, to visit his family, a journey of over two weeks each way. It may well be that Endrés learned about this area from Juan López, and that he decided to travel with him when he returned to the mountains. Endrés makes specific mention on one of his labels of Calderón's trail (the 'Picada de Pedro Calderón') and on several of his specimens from Dota mentions 'the road to Térraba'. Calderón and López received shelter and supplies from Patricio Granados, a landowner in Copey who is often named (as *"the savanna de los Granados"*) by Endrés on his labels.

To the Southeast of Cartago Endrés collected in and around Aguacaliente. It could be that he continued along this route to the valley of Orosi and Ujarrás.

While ascending the slopes of the Cordillera de Talamanca, Endrés rode[53] along the *Quercus* forests that characterize the "Tropical Lower Montane Moist Forest" and the "Tropical Lower Montane Wet Forest", rich in small orchids, ferns and bromeliads; the first extending as high as Corralillo and Frailes, and the second on higher altitudes, in the Dota

[48] Anacleta Arnesto de Mayorga (1809-1877) was a rich widow, owner of an important coffee farm near Paraíso, and one of the first women in Costa Rica who took an active part in politics.

[49] W Rchb-Orch 38548/W0020768.

[50] W Rchb-Orch 37148/W0020946.

[51] W Rchb-Orch 33226/W0020272.

[52] W Rchb-Orch 38623/W0020363.

[53] There is no indication in the existing documents on how Endrés traveled, but the long distances that he covered in a relatively short time can only be explained if we accept that he had horses at his disposal.

and Tarrazú valleys. Both are similar, evergreen forest with two tree strata, difering mainly in tree height, which becomes smaller at higher altitudes, and the understory, which opens up as one climbs above the 1,600 m mark at Frailes on the road to Tarrazú.

Special mention deserves the high altitude areas above Copey de Dota, on the trail to the Cero Buena Vista. The "Tropical Subalpine Rain Páramo" is the *"northwesternmost occurrence of Andean Páramo, originally restricted to the highest peaks of the Talamanca Cordllera, but extending downward to the Cerro de la Muerte… Páramo refers to cold, inhospitable, and humid landscape above the tree line. In the northern Andes and in Costa Rica páramo is dominated by shrubs where drainage is adequate, but bogs occurr when drainage is poor. Andean páramos are best known for the tree espeletias (Compositae) which dominate the landscape."*[54]

North of Cartago: the slopes of the Irazú volcano

Although no exact date is known for his excursion, Endrés collected on the slopes of the Irazú volcano (FIG. 71). In his description of the flora of the Turrialba volcano, he writes to Dow (Endrés, 1872): *"... yet the flora is much the same as that of the contiguous Volc. Irazú, interspersed with a few sp. from the crest of Dota."* Clearly, he had been on the Irazú and in Dota before ascending to the Turrialba. Endrés names several collecting localities in this area: Cot, Potrero Cerrado, Pascón (near Pacayas), 'Felipe Díaz' (a Spanish conqueror, who in 1569 had been granted a large part of Cot and its neighborhood) and Cerro Grande[55] .

This area corresponds to the "Tropical Montane Wet Forest", which according to Hartshorn is restricted to the summit and the upper southwest slopes of the Irazú Volcano. As most of the vegetation was destroyed or severely damaged by volcanic eruptions in the years of 1963-1965, Hartshorn assumes that this should be *"an evergreen forest of intermediate height and two tree strata. The canopy should be dominated by Quercus spp. Bamboos should be abundant in the shrub layer."*[56]

The Central Mountain Range (Poás and Barva volcanoes)

Again, we have no dates for Endrés' collections along the southern slope of the Central Mountain Range. However, he names frequently localities along the route to the Poás (also called by him 'Volcan de los Votos') and Barva volcanoes and seems to be quite familiar with that area. San Isidro, Itiquís River, Desengaño, Poás and Barba are names which are often found on the herbarium specimens preserved in Vienna. Charles Lankester, who seems to have been familiar with Endrés' itineraries, wrote about Varablanca, a locality on the pass of Desengaño: *"Endrés worked it, but probably mainly for horticultural stuff!"* [57].

[54] Hartshorn, G.S. 1983. *Op. cit.*, p. 125.

[55] W Rchb-Orch 38538/W0019322, W Rchb-Orch 36720/W0021668; and many others.

[56] Hartshorn, G.S. 1983. *Op. cit.*, p. 125.

[57] Letter from Charles H. Lankester to Oakes Ames, July 27, 1923. Lankester, C. and Ames, O., 1922-1946. Correspondence. Courtesy of the American Orchid Society. Library of the Lankester Botanical Garden, University of Costa Rica.

Figure 71. Ascent to the Irazú Volcano. In Vargas, 2008.

North of the village of Barva, Endrés seems to have been acquainted with Pío Murillo, the owner of a large farm close to the crater of the Barva volcano.

It is clear that Endrés was well acquainted with this region. One of his notes on a herbarium sheet preserved at Vienna reads:

> *"Plenty of the Poas Sobralia along the road from Alajuela (Camino de las Canoas) to Desengaño, some 2,000 yds. above Casorla's Hacienda growing on the respaldos* [embankments of the road] *(terrestrial). Further up towards where the "Tambor" river crosses the road, Odontoglossum cariniferum with ovate oblong,* [...] *bulbs, ovate acute leaves and a 2-3 ft. long erect stout 50-60 fl. panicled peduncle and rachis somewhat glaucous. On the same spot a pendulous 8 in. long Epidendrum with lanceolate acuminate fleshy green leaves flat* [...] *behind. Flowers in a slender fine branched irregular short panicle, pale* [...] *lilac, spurred, small, inconspicuous. Sept. Oct. Among the Poas Sobralia, Fregea Batemanniana with deep purplish carmine flower, the base of labellum white blotched with deep crimson. Above Santa Bárbara plenty of Epidendrum campylostalix, Odontoglossum pulchellum ? the Candelaria & Poás variety. Above San Isidro (Alajuela) Epidendrum campylostalix, Lycaste candida, Odontoglossum pulchellum and some plants of Odontoglossum cariniferum"*[58].

A man named José Mora seems to have been Endrés' guide to the Poás volcano. In his Notizbuch II.[59] Endrés mentions a 6-day journey to the volcano, for which Mora was paid $4,50 (Pesos, the Costa Rican currency of that time).

The higher slopes of the volcanoes of the Cordillera Central fall into the "Tropical Montane Rain Forest", already described when narrating Endrés' crossing of the Pass of Desengaño. Let us fall back again on Standley's description of the vegetation of Costa Rica at higher altitudes, described by him as "Tierra Fría" (Cold Region).

> *"The fame of Costa Rica's flora for bewildering variety and exquisite beauty is based primarily upon the vegetaton of the tierra fría… If a botanist has only a short time to spend in Costa Rica, he should hasten to the upper slopes. He will never forget what he sees there of profuse vegetation, and he will have seen, no matter how long he remains, only a small fraction of the whole… In all North America no region can compete in variety of vegetation and number of species with the higher mountains of Costa Rica, except the similar adjoining Province of Chiriquí in Panama."*[60]

Standley then compares Pittier's and Wercklé's definition of these regions, and proposes to divide the *tierra fría* in a lower belt, from 1,500 m to 2,600 m elevation (following Wercklé) and an upper belt above 2,600 m (according to Pittier).

> *"The tierra fría is the region par excellence of epiphytes. Conditions are ideal for their growth –moderate shade and constant, abundant moisture. First in interest are the orchids, for*

[58] W Rchb-Orch 36911/W0021520; W Rchb-Orch 38546/W0019496.

[59] Endrés, A.R. 1870. Archives of the Natural History Museum, Vienna.

[60] Standley, P.C. 1937. *Op. cit.*, pp. 30-31.

which Costa Rica is famous… When, ascending the slopes of the volcanoes that overlook the Meseta Central, one comes to the cloud line previously described, one realizes that there at last is the paradise for orchid hunters.The trunk of every low tree beside the road bears several large clumps of orchid plants. Let no one suppose that the abundance of orchid plants involves a profusion of orchid flowers… Orchid species with large and showy flowers are few, and their blooming season seems to be usually short… There are a few delicately beautiful flowers than a thrifty clum of the lovely Epidendrum Endresii (certainly to be envied is the orchid collector for whom it was named), with its panicles of small, white and purple blossoms."[61]

No one specific vegetation zone is homogeneous. This is the case for the lower parts of the valleys of Dota and Tarrazú, which clearly cannot be described as cold regions, and fall into Standley's *tierra templada*, as described later.

The Northwest: San Ramón and surroundings and the road to San Carlos (1867-1874)

The town of San Ramón was not only the favorite collecting area for Endrés, but for most of his time in Costa Rica also his place of residence. From his letters to Captain Dow and Prof. Baird we know that he lived in San Ramón at least from November 1867 until April 1874. In September of 1872 he even bought a piece of property in the center of the town[62]. At least four herbarium specimens with collecting localities close to San Ramón (Quebrada Verde, Cerros de los Palmares) are dated in 1867, a clear indication that this area was explored by Endrés from the very beginning of his stay in Costa Rica.

Endrés first came to San Ramón in the last half of 1867, after he was named superintendent for the construction of the road to San Carlos, which led from the district of Los Ángeles (to the North-Northwest of San Ramón) to the Cataratas River and from there to the *"navigable waters of the San Carlos River"* (Endrés, 1869). This is the route which Endrés calls "the road to San Carlos" or "the new road to San Carlos". However, in a few cases Endrés mentions "the old road to San Carlos". This road went from Alajuela to Grecia and passed through Zarcero, Zapote and the La Vieja River. It had been opened in 1850 by the expedition of Martínez and Toledo and was of military importance during the campaign of 1856 against the troops of William Walker[63]. After the war, it was abandoned. In Endrés' time it must have been no more than a trail[64].

Living in San Ramón, Endrés could travel in any direction and find undisturbed forests, ideal for his purposes. Journeys of no more than 1-3 days brought him to the North, to the hacienda of Ramón Rodríguez Solórzano (one of the founding fathers and the first mayor of San Ramón) at Silencio, the ford at the San Lorenzo River, to Quebrada Verde (near Balsa), and reaching as far as the headwaters of the San Carlos River. The trail to San Carlos, at the

[61] Standley, P.C. 1937. *Op. cit.*, pp. 34-35.
[62] Archivos Nacionales de Costa Rica, 2008.
[63] Hilje, L. 2008. *Desde el ausente muelle, en Muelle.*
[64] W Rchb-Orch 142213/W1889-0142213.

ford of the San Lorenzo River, was also known as 'picada de Nelson', or 'Nelson's path', and Endrés mentions the house of P. Nelson in this area. His incursion to the Arenal Volcano (called at that time 'Cerro de los Guatusos') was surely coincidental with his travels during the construction of the road to San Carlos.

To the Northeast, passing through the hacienda of Julián Volio (the village of Volio of present days) he collected in Zarcero, Palmira, Laguna, Zapote and Tapezco. A note in his "Notizbuch II"[65] (Endrés, 1870) reads *"Sarcero, June 10th, 1871"*. To the Southeast we have seen specimens from Palmares, Candelaria, San Roque and Grecia. To the Southwest he collected in Río Jesús and the lime-kilns of La Calera. To the South he described plants from Dujardin's Hacienda La Francia and to the Northwest from La Paz, Potrerillos, and the rivers Piedras and Barranca. Near Potrerillos he mentions the "lands of Teresa Rodríguez", meaning undoubtedly Teresa de Jesús Rodríguez Vega, the widow of Pioquinto Alvarado Arrieta (1816-1843), another of the founding fathers of San Ramón.

The region of San Ramón, as most of the Central Valley falls into Holdridge's "Tropical Premontane Moist Forest", in our days the most altered Life Zone in Costa Rica, with no significant areas of primary foresst remaining, a result of the rapid colonization of these areas in the second half of the XIX century. Endrés was the last important plant collector in Costa Rica who could experience the virgin forests around and to the north of San Ramón in their full splendor. The "Tropical Lower Montane Moist Forest", already described from the southwest of Cartago, occurs again around Zarcero, another of Endrés favorite collecting areas. Epiphytic orchids are usually small, from the subtribe of the Pleurothallidinae, the exceptions being a few specimens of the genera *Brassia*, *Encyclia*, *Prosthechea*, *Epidendrum*, *Maxillaria*, and *Osmoglossum*.

The West: the road from San Ramón to Puntarenas

The 'National Road', connecting the capital city of San José and the port of Puntarenas, on the Pacific, was built between 1844 and 1846 and was the only road apt for oxcarts in Central America at that time. Although Endrés probably could have found a shorter route to Puntarenas, it seems clear, from his letters, that he traveled always first to Atenas (through Palmares and Candelaria), and then on the National Road to San Mateo, rivers Paires and Jesús María, Esparza, Barranca and Chacarita until reaching the harbour. All of these places are well documented on orchid collections by Endrés, who still uses for this road the name "Camino Real" [Royal road] from Costa Rica's colonial times. Other collecting localities of Endrés near this route are Río Grande, Balsa and Picagres.

His visits to Puntarenas had seemingly always the same purpose, which was to meet his friend and mentor Captain John Melmoth Dow, but this route was also important for Endrés because it was via Puntarenas that he received his mail and that he sent his plants and herbarium specimens.

Again, Hodridge's "Tropical Premontane Moist Forest" is the Life Zone that best characterizes the area to the south, west and southwest of San Ramón.

[65] Endrés, A.R., 1870. Archives of the Natural History Museum in Vienna.

South, Southeast, and Southwest of San José

There are no documents to tell us when Endrés collected in this area. According to L.D. Gómez (pers. comm. 2006), we assume that, in the first months of residence in Costa Rica, he lived for some time in San José, and this may have been the time to explore the surroundings of the city. He could have taken the route to Aserrí and from there to Tabarcia and Pacaca exploring on the way the mountains of Tablazo and Cerro del Dragón[66]. He also collected on the hills of Carpintera (to the East of San José) and Pico Blanco, to the Southwest. When travelling from San José to Cartago, Endrés seemingly always used the old colonial road, from San José to Desamparados and from there over Patarrá and Tobosi to Tejar and Cartago, thus traveling along the southern flank of the Carpintera mountains, rather than over the 'modern' road through Tres Ríos[67]. This road was known as the "camino por lo alto" [road along the heights] or Cavallón's road[68]. The already described "Tropical Premontae Wet Forest" is characteristic for the lower Pacific and Atlantic slopes of the Central Valley. Standley, following Wercklé, described the "Tierra Templada" (Temperate Region), within 800 to 1,500 m of altitude. The regions previously described, namely the surroundings of San Ramón and the regions to the south of San José, fit well into this definition.

> *"This belt is one of transition, and not sharply marked anywhere, as so often is true of plant belts. It is no easy matter to indicate species most distintictive of the area, because so many extend higher or lower, but the same may be said of most of the other regions more or less arbitrarly defined here. On the Pacific slope the so-called tierra templada is much bettrer marked than on the Atlantic, for in the former it may be taken to include all mountain slopes at middle elevation that have a well defined dry season. The upper limit is recognized readily when, in climbing the slopes of the volcanoes, one meets the line at which trees begin to be heavily infested with orchids, mosses, and other epiphytes… Originally the tierra templada must have been covered by a dense, moist or wet forest in which oaks (Quercus) predominated."*[69]

The journey of Augustus R. Endrés to Panama

Endrés traveled to Panama sometime between May 1871 and April 1872. In September 1872 Endrés wrote to Dow from Puntarenas *"for the first time since my visit to the isthmus have I come down to the port..."*[70], remembering his visit to Panama which had the purpose of delivering in good conditions to the transatlantic steamer a shipment of orchids to Veitch. As Dow wrote later to Endrés: *"I am sorry the Messrs. Veitch were not satisfied with the remittance you took so much pain to accompany to Aspinwall"*[71]. From his few collection dates, it can be assumed that he arrived in Panama sometime in June of 1871 and embarked for his return to

[66] All named on his herbarium labels: W Rchb-Orch 36218/W0019352.

[67] W Rchb-Orch 38546/W0019496.

[68] Juan de Cavallón y Arboleda (1524-1565) was a Spanish conqueror who in 1561 founded Garcimuñoz, the first Spanish city in Costa Rica's central valley, situated at the present location of Desamparados.

[69] Standley, P.C. 1937. *Op. cit.*, pp. 21-23.

[70] Letter to Dow, September 27, 1872. Cornell University.

[71] Letter to Endrés, Oct. 12, 1872. Cornell University.

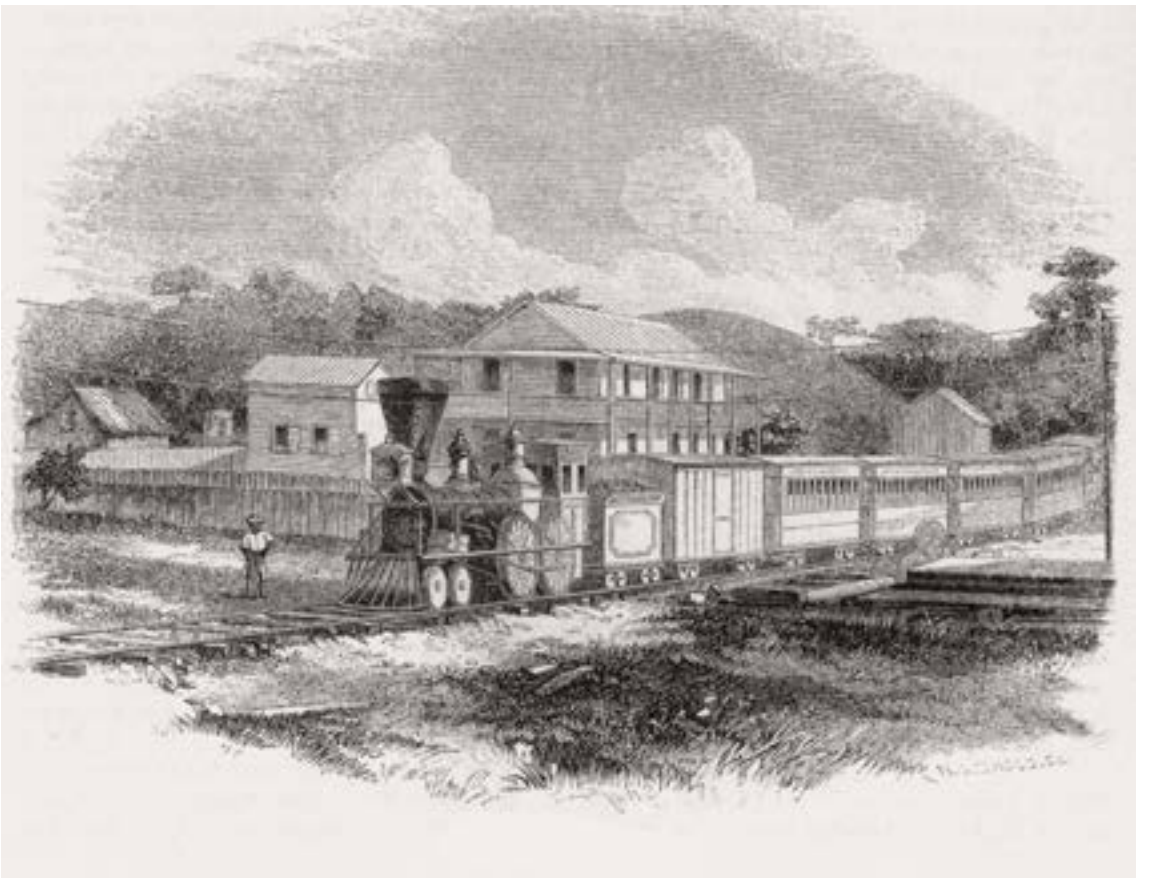


Figure 72. San Pablo station, Panama. In Vargas, 2008.

Costa Rica on April 12, 1872. This means that he could have been as much as 10 months away from San Ramón. The main purpose of this trip was clearly not the collection of orchids, of which barely a dozen can be found in the archives of the NHMW[72].

Also, in *Hortus Veitchii*[73], concerning *Epidendrum lindleyanum*, one reads: *"The variety Centerae was introduced by us from Costa Rica, in 1873, through M. Endres; and dedicated to Mrs. Center, the wife of the then superintendent of the Panama Railway"*. Endrés was obviously familiar with Panama, the railway and its officials and the fact that Endrés had suggested the name *Restrepia centereana* for the specimen of *Restrepia trichoglossa* collected by him, we presume that the superintendant's wife had made quite an impression on him. One therefore wonders if the superintendant was aware of the honour subsequently bestowed on his wife by a passing stranger – *"if indeed he was just a passing stranger"*[74].

We also presume that Endrés was using the railway to reach the eastern seaboard of Central America to sail home to Europe as there was no deep-sea port on the Atlantic coast of Costa Rica. The localities indicated by Endrés on his specimens are all referred to the railway, namely three of its stations: San Pablo, Obispo, and Matachín (FIG. 72-73).

[72] W Rchb-Orch 5547/W0020710.

[73] Veitch, J.H.,1906. *Hortus Veitchii*. Private edition, London.

[74] Manning, S. 2010. *Discovering New World Orchids*. Steve Manning, Nantwich, U.K.

Figure 73. Matachín station, Panama. In Vargas., 2008.

Endrés introduction to Alexander Center and his family must again have been the work of John M. Dow. Dow was a good friend of the family. In April 1872 he wrote to his wife: *"*[...] *knowing of my intimacy with the Center family..."* and further on, in the same letter: *"*[...] *so far as their society is concerned I would not ask for more agreeable company than they* [Mrs. Center and her daughters] *have proved themselves to be"*.[75]

Standley, who visited Panama in 1923-1924, gives an accurate description of the vegetation of the present Canal Zone in Panama, which overlaps fairly well with the route of the former Panama Railway, along which Endrés made a few collections of orchids during his brief visit to Panama during the years 1871-1872.

> *"All the Canal Zone region lies within the so-called Lower Tropical life zone, of which there are two main divisions, the Humid and Arid, the former restricted in Central America to the Atlantic slope, the latter chiefly to the Pacific watershed. Our area in both its divisions is quite representative of these subdivisions as developed upon a larger scale farther north in Central America. Since all the Isthmus is low, nowhere exceeding an elevation of 1,000 feet, we can not expect that diversity of vegetation which in other parts of Central America*

[75] Dow, J.M., letter to his wife, Archives of Cornell University.

results from a much greater variation in altitude… The vegetation of the Atlantic slope of the Canal Zone is very like that of the whole eastern coast of Central America, as fafr north as Guatemala, and it must be closely similar to that of the humid coast of Colombia. The flora of the Pacific slope of this portion of Panama is so much like Costa Rica, Salvador, and Gautemala, that one would scarcely notice the difference, were it not for the savannas that exist in the former region; but these occur also in southern Costa Rica."[76]

[76] Standley, P.C., 1928. Flora of the Panama Canal Zone, pp. 29-31. *Contributions from the United States National Herbarium* 27.