PHYSIOGNOMY

OF

TROPICAL VEGETATION

IN

SOUTH AMERICA;

A SERIES OF VIEWS

ILLUSTRATING THE PRIMEVAL FORESTS

ON

THE RIVER MAGDALENA

AND IN

THE ANDES OF NEW GRANADA,

WITH

A FRAGMENT OF A LETTER FROM BARON HUMBOLDT TO THE AUTHOR,

AND

A PREFACE BY FREDERICK KLOTZSCH;

BY

ALBERT BERG.

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1854.
TO

HIS ROYAL HIGHNESS THE REIGNING GRAND-DUKE

FREDERICK FRANCIS

OF

MECKLENBOURG-SCHWERIN.

THIS WORK

IS MOST GRATEFULLY DEDICATED

BY

HIS ROYAL HIGHNESS’

MOST FAITHFUL—AND HUMBLE SERVANT.

ALBERT BERG.
The object of the present work is to describe the landscape physiognomy of the vegetation of an interesting portion of tropical America. Powerfully excited by Baron Alexander Humboldt’s writings, the artist has himself visited the tropical regions, has studied them diligently and accurately, and, however imperfect his delineations may be found, he can at least vouch for their faithfulness. May they prove an aid to the imagination of those, who, equally with himself, stimulated by the inspired descriptions of the great master, would wish to picture to themselves those regions, so exceedingly favoured by nature.

To figure to ourselves something totally unfamiliar to our minds, without a visible representation of the object, is at all times a difficult matter. Most of the component parts of a landscape, the rocks and the mountains, the air and the clouds, the hue of the water and the swell of the ocean, though presenting a great variety in their particular features, yet, upon the whole, bear a certain resemblance all over the globe. We have, in this instance, but modifications of what we behold daily in our own country; hence, the facility with which the imagination conceives such objects. But it is different with vegetable productions. Here, the different zones present a multifarious variety, such as the most vivid imagination is unable, without being assisted by illustrations, to realize.

Of detached plants, specimens from the hot-houses certainly convey a more lively picture than any illustration, but not so as regards their appearance in groups, or those larger forms of the vegetable kingdom, which, in fact, determine the character of the landscape. The artist will be happy, if he has succeeded in contributing some small share to a more intimate acquaintance with the landscape physiognomy of the vegetation of tropical America.
PREFACE.

As a discussion of the question whether every work should have a preface, however exhaustive in itself, would be out of place here, as it is very seldom that any body ever thinks of reading a preface at all. But the author, who is my intimate friend, has just undertaken a tour to the Greek Islands at the command of His Majesty, and is thus prevented from writing the preface himself. At the risk, therefore, that no one will ever read the few words which I have willingly promised the author to say in his behalf, I shall state, shortly, by way of general explanation, such points as may appear to me sufficiently important to deserve mention.

The author, who is an extremely tutored young man of about eight and twenty years of age, has distinguished himself by the great variety of his learning and accomplishments, and notwithstanding the delicacy of his constitution, possesses energy, industry and perseverance in a degree in which such qualities are seldom found united. After he had commenced the study of the law, for which profession he was originally intended, the strong bent of his mind towards art manifested itself so decidedly, that it was impossible to mistake any longer his true calling, and the specimens of his talent which authorized great expectations, justified the determination which he formed with the approbation of judges of such subjects, to exchange the study of law for that of art. From this time he lived entirely for art, and with the assistance of celebrated masters soon succeeded in acquiring the mechanical advantages of a rational school, without however his own genius being thereby prevented from making itself felt.

His study of nature commenced with a residence of some years in Switzerland, which was immediately succeeded by a tour in Italy. He had already enjoyed the favours of H. R. H. the Grand Duke of Mecklenburg-Schwerin, who highly appreciated his talents, and whose invitation to accompany him on his travels he now joyfully accepted. He accompanied the Grand Duke to Sicily and Turkey, remained some time in Constantinople, and made a little excursion to the Troad. Having returned to Germany in 1848, he commenced the necessary preparations for a voyage to New Granada; part of the results of which are to be found in the present work. His author for this enterprise had already been inspired by the incomparable descriptions of Alexander de Humboldt, the pride of our millennium.

Having arrived in New Granada in the beginning of October, Mr. Berg had the opportunity of studying the hot district of the Magdalena River in the rainy season, and the mountains of the Quindio during the dry season.

Though it is far from my intention to pass any critical judgment on the artistic merits of the following plates (which the author has himself lithographed from his own designs), I may be allowed to observe, that they give evidence of a power of grasping the characteristic features of a landscape, with extraordinary life and spirit, as also of very masterly handling. I can further assure that the manner in which the habitual peculiarities of the individuals have been both conceived and executed, is so successful, that it may be recommended to the professional botanist as a pattern of excellence. But these plates possess great interest not only for systematic Botany, but in a still higher degree for geographical Botany,—a branch of learning, which has been raised by our illustrious countryman Baron Humboldt to the rank of a very important science. They are also of great value for the study of Architecture in general, but more especially for that of the landscape-gardening,—which if it has recourse to such sources as the plates before us, by the substitution of representatives offering similar changes of form, promises great and brilliant unanticipated results.

These virgin forests, the originals of the present system of creation, are indeed also exposed to the influence of the seasons, in the same manner as we are accustomed to perceive them in the temperate and colder regions of our globe, but not in the same degree. These plants for instance, which lose their leaves during the dry season, or the period of whose growth is limited to a definite time, are to be met with for more nearly there, than with us. The effect occasioned by the metamorphoses of the leaves, or by the transformation of the leaves into more highly developed organs, requires rest more rarely there, than is the case with our leafed wood and shrubs. The distinction which is there determined by the wet and dry seasons, corresponding to our Winter and Summer, is only very slightly marked in the development of the vegetable world. A so-called winter-deep, the reason of which is never to be sought in any fall of temperature, but entirely in the specific peculiarities of the plants, is almost exclusively confined in those forest regions, to the representatives of the Bignonieae, Bombacineae, Mammagragineae, Aroidine, Cyclanthine, and the Leguminosae; and changes in the physiognomy of the vegetable world, when they do occur, are solely dependent upon such events as Nature herself may prompt.
This, however, is by no means the case with the physiognomy of our own forests, which have for the most part lost their original character through our artificial encroachments. We can indeed determine with certainty, that their characteristics were produced by the common British Oak, the sessile-fruited Oak, the common Beech, the Hornbeam, the Birch, the Alder, the Willow, the Elm, the Scotch Fir and the Austrian black Fir, etc., but we are quite unable to state in what proportions these trees were to be met with, as we possess no pictorial representations of our primordial forests similar to those in the plates before us. Neither are we able to say whether the so-called Poace-tree, the Apple-tree, the Pennus Avium, and other trees which are frequently met with in our forests, really belong to our country, or whether they have been brought here and afterwards have grown wild, nor do we know where they come from.

The appearance of our forests changes with nearly every fresh generation of man, and it requires no prophetic spirit to be able to foretell that these changes will increase in the same ratio that science succeeds in bringing the experience of practicable vegetable physiology into general application. As confirmation of this position I will adduce a single example. It is a well known fact that the actual value of a forest is in proportion to the amount of carbon it contains. It has further been confirmed that the development of the seeds consumes a much larger proportion of carbon than all the other parts of the plant. Males or monogamy which are produced by the crossing of the organs of fecundation of two legitimate species, have the remarkable and invariable property of forming no seed, because the pollen which is formed in the anthers of such blossoms, does not possess the power of developing its pollen-tubes, which are absolutely necessary to the act of fecundation. But the carbon which is secreted by legitimate species is employed in the formation of the seeds, can be diverted to the formation of the wood in the Male-species, and this is found to be naturally the case, without the slightest injury to the wood, in respect either of its durability or of any of the numerous purposes to which it may be applied. On the contrary, the microscopic analysis of the wood of bastard-trees has shown that the membranes of the cells are thicker than in the wood of legitimate species from which they were produced; and this justifies the conclusion, that notwithstanding its more rapid growth, the wood of bastard-trees gives promise of a greater degree of firmness than we have been accustomed to find in the wood hitherto employed. Bastards bear in their habit unmistakable traces of the characters of the parent plants, but they invariably differ from the latter in the much greater rapidity of their growth, as also in their general appearance, and if planted together therefore in greater numbers, are calculated to change the physiognomy of the landscape.

The subject to which I have above alluded is one of great financial importance to every country, and well deserves the attention of governments. Should it at some future time be adapted in practice on a larger scale, it will conduces very materially to the interest of the state. A very few years are sufficient to enable us to recognize the advantages of this procedure, and very few trials are necessary to produce conviction that the necessary manipulations are extremely easy and attended with very little trouble. For this purpose I would recommend the fecundation of the Scotch Fir (Pinus sylvestris) with the pollen of the Austrian black Fir (Pinus nigricans), of the common British Oak (Quercus pedunculata W.) with the pollen of the sessile-fruited Oak (Quercus Robur W.), of the common small leaved Elm (Ulmus campestris L.) with the pollen of the Wych-Elm (Ulmus australis Smith.), and of the common Alder (Alnus glutinosa) with the pollen of the white Alder (Alnus incana). In the above mentioned examples of Pines, Oaks and Alders, which belong to those plants whose blossoms possess separated anem, it is only necessary, that before the full development of the female organs and for a certain period after the fertilization has taken place (which is effected by means of a stiff hair-pencil), the female blossoms which are used in the crossing, should be carefully enveloped in some cotton texture, admitting the access of the air but excluding the pollen of the male blossoms of the same plant. The reception of the pollen of a different species takes place most readily when the sky is bright and clear, and in the morning hours between six and nine. Dull rainy weather is disadvantageous even to the normal act of fecundation, but still more so to the abnormal process effected by crossing. The stigma which is susceptible of conception enables either a vaporous, or moist, sticky, sometimes even a fluid juice. This property causes immediately after the act of fecundation to be completed, while in the case of the pollen being entirely excluded, or only indiffertent dusty matter being sprinkled upon it, the humidity of the stigma continues for a longer period. This stamium is the one best calculated for the application of the pollen and thus effecting the crossing. The pollen preserves for several days the property it possesses of forming pollen-tubes, as soon as it is brought into connection with the slimy fluid secreted on the stigma, and may therefore be collected for this purpose several days before.
FRAGMENT OF A LETTER

OF

BARON ALEXANDER HUMBOLDT TO MR. ALBERT BERG.

In the noble creations of painting our imagination delights to find animated pictures of exotic scenery, this enjoyment is by no means exclusively confined to the majestic in the forms or in the richness and wild luxuriance of the soil which such pictures may present, but is at the same time reflected in our understanding. It reminds us of the intimate relation between the distribution of forms and the influences of climate depending on the altitude of the plateaux, as also on the latitude. It is this relation which, by presenting to us the wonders and peculiar characteristics of the vegetation, renders that, which at first seemed only picturesque, both instructive and suggestive in the field of Physical Geography.

Before I enter, my dear Sir, upon the charming subject of the region regions of South America, I have thought it right to determine the point of view from which I consider the publication of the drawings you were kind enough to present to me, both as useful and desirable as a high degree. These happy conceptions, displaying at once fine talents and the inspiration of a deep love of nature, will possess an interest all the greater, inasmuch as they refer to countries which had not yet been visited by distinguished artists. Speaking generally, it is only within the last few years that any person has devoted themselves with much interest to the representation of the great forms of the equatorial zone, and their varied groupings under their real physiognomical aspect. Your work is quite worthy of appearing at the side of those of your illustrious predecessors.

Having lived for several years with my excellent friend M. Bonpland on the declivity of the great Cordillera de los Andes, and in the very same countries which you have visited, I must bear testimony to the admirable truth with which you have succeeded in representing not only the interior of the virgin forests, but also that alpine vegetation of the Cordilleras which offers an entirely different character. You have not contested yourself with assigning the type of the greater productions of the vegetable world by placing them in the foreground, but you have also represented their individuality and that curious interfering of the roots above the soil, of which the forests of our temperate zone offer no example. The drawings of the passage of the Cordillera in the Paramo de Quindio which you are going to publish, will give great interest to your work. The breadth of the chain interrupted by valleys and ravines is so considerable, that not wishing to be carried in a little chair of bamboo rods on the backs of the natives, I required twenty-four days for my journey from the small town of Buga to that of Cartago. I have found the highest point of this route, that of the division of the waters, to be at an elevation of 1730 toises (10748 feet) above the level of the South Sea. It is the Garganta del Paramo where we have encamped in a portable hut made of the large leaves of the Muutintoc and is almost 600 feet higher than the summit of Elba. In a much more southern passage of the Cordilleras, at the Paraiso del Ananay (S. Lat. 2° 11') between the town of Atanua and Cucucao, I have found the highest point of the route at the Lodero de Calidad at an elevation of 2428 toises (14568 feet), which is nearly the height of the summit of Mont Blanc. The Paramo de Quindio presents the very extraordinary phenomenon of a group of Palm-trees which may be classed amongst the alpine plants. To this group belongs the Wax-palm (Ceroxylon), also known as the Dendrobynum Andinus) and the Cima de la Villosa (Kunthia montana). Whilst the family of the palm-trees generally only vegetates in the tropics in a zone where the mean temperature of the air is from 22° to 24° of the centigrade thermometer, and is not found on the declivity of the Cordillera at a greater elevation than 2000 or 2500 feet, the alpine Palm-trees which we have just mentioned are first found at Quindio (with a northern latitude of 4° 26' to 4° 34') at an elevation of 6000 feet with a superior limit of 9000 feet. This is a region which in this zone is still 5400 feet from the inferior limit of perpetual snow, and in which, according to my observations, the thermometer often falls in the night to 4°, 8 and to 6 above the freezing point. To you, my dear Sir, belongs the great merit of having been the first to represent the physiognomical trace of the Wax-palm, whose majestic and slender form, according to the stems which I ordered to be cut down, attains a height of 100 to 150 feet. The drawings in which you have represented these Palm-trees are the most graceful ornament of your work.

The description of the Wax-palm with the Conifer (the yew-tree-leafed Podocarpus) and the Oaks (Quercus Grandis, similar to our northern Oaks) forms as remarkable a contrast as the mixture of Palm-trees
with Pires (Pimara occidentalis) and with the Mahogany (Swietenia Mahagoni) of the warmer regions of the 
Isol de Pinos in the south of Cuba, and in the Pearl of the Cape de Maya in the north of Cuba, which 
Christopher Columbus already mentions with astonishment in his Journal of Navigation of November 1492.
Types which we call northern, supposing them to belong exclusively to cold and temperate regions, appear 
again with the same facility, but in very different species, in the tropical regions of America and the Indian 
Archipelago. It is this circumstance which occasioned me to say in one of my earliest works, that the 
habitants of the equator, where the climate foil each other on the plateaux as on different stories, have the 
privilege of contemplating at the same time all the stars which glitter in the vault of heaven, and almost all the 
forms of vegetable life.

The view of the volcano of Tolima, which may be enjoyed from several points of the eastern side 
of Quito, has supplied the subject of one of your most picturesque sketches in Plate III. The volcano, 
which is of a very regular shape, and like the Cogolinho de Quixos, rises in the form of a truncated cone, forms 
the background of the landscape; while in the foreground, the soil is perceived to be encumbered with a most 
luxuriant growth of the tree-fern, the Helechone and Passiflora, which climb to the top of the trees. It is a 
great advantage of your collection, that, through the care of an excellent botanist, Dr. Klotzsch, my friend 
and colleague at the Academy of Berlin, you have been able to add to your drawings the botanical names of a great 
number of species, and this with the greatest accuracy. As the learned Sam is Director of the great collection 
of Herbarium, he has been able to consult the reports of M. Bergh and myself, in which we have indicated the families, as also the descriptions given by M. Kruse, in our "Nova Genera et Species Plantarum;" 

In your beautiful drawing, the vast snowy masses appear in the horizon through a clearing in the forest. They 
stand out against the azure of the tropical sky at an apparent but illusive proximity. A formidable eruption of 
the volcano of Tolima took place on the 18th March, 1805, and devastated the entire province of Miritu, 
since which time it seemed almost extinguished. A celebrated chemist, M. Bonningholt, accompanied by 
M. Gondet, the botanist, ascended it to the height of 15,240 feet, which is very near to the region of perpetual 
snow, in order to examine the composition of the vapours emanating from the cliffs of stony rock, which has 
itselves emerged from the bosom of a formation of miscellaneous and amphiphilic ash. Recently the volcano has 
again become in activity. It deserved a place in your work and in my views of the Cordillera, all the more, as it 
seems to me to be the loftiest summit of the whole northern hemisphere of the New Continent. I made a 
trigonometrical measurement of the Tolima in the valley of the Cayambe, on the west of Quito, and found it 
354 feet higher than the Pocagua, the great volcano of Mexico.

Descending with you, my dear Sir, from the heights of the Cordillera, to the lower regions of the valley of 
the Magdalena, I take much pleasure in bearing the same testimony to the truth with which you have judged its 
character. Having passed fifty-six dull days in navigating this great river, I had sufficient time to become 
acquainted with the distribution of its vegetation. The affections interested which I take in yourself, induces 
me to advise you to leave to your interesting drawings, so excellently drawn upon stone, that character of 
the ancient states which they have had in their original state. All later additions to objects of which we received happy 
inspirations, take off a little from the spirit of the drawing. I do not mean to say that the technical perfection 
of a drawing carefully finished on the spot, may not add to the effect and to the truth of the character of the 
landscape; but a traveller in his rapid progress through places difficult of access, is very seldom in a position to 
finish his sketches at leisure. The travels in a beautiful part of the East, which you were so happy as to make 
before your journey to New Granada, have fortunately prepared you to arrive with talent in different zones the 
report of the forms which are the real elements of the beauty of a landscape.

Potsdam, May 1853.
NEW-GRANADA.

Text studies for these illustrations have been compiled in New-Granada, between the 4th and 12th degree of northern latitude, principally on the river Magdalena, in the eastern Cordillera between Osaka and Santa Fe de Bogotá, and in the Cordillera de Quindío, on the mountain pass between Bugaú and Cartago. These two great mountain-chains issue from the knot of the Paramo de Guaviare, where there is likewise the source of the Magdalena river, along the banks of which, diverging but slightly, they then run at some distance from each other in a northern direction. Spurs of both chains project on various spots close to the river, which, at Honda, they finally contrast. Here the great valley widens. The Cordilleras stretch a considerable distance along the river, as far as almost the eighth degree of latitude, where the Cordillera de Quindío loses itself in the plain. The river then bends to the north-west, joins the Caura, and flows into the vast plain, which is bounded in the north by the Caribbean sea.

Nearly all the climates of the globe are to be met with here in a small space. Thus, while on the coast and on the banks of the Magdalena a middle temperature of 25°C prevails, the summits of the Cordilleras rise to the heights of everlasting snow.

Here the landscape elements are found in a rare abundance: the mighty river, the primeval forest of the plain and of the mountains in the greatest variety, and the picturesque dwellings of the natives, raised amidst Banananas and Sugar-cane, and overshadowed by Ceucalmus and powerful Ceilans. The eye of the traveller now roves from the declivities of the mountains over the vast wooded plain of the Magdalena river, or glides over an ocean of clouds to the summits of the mountain-chain opposite, rising from it like islands; now he beholds himself confined amidst deeply furrowed Alp-vales, here wildly cleft, there clothed with a lovely vegetation and refreshed by rapid torrents. From the wonderful magnificence of blossoms of the Paramo-shrubs, the traveller, having quitted the extreme Oak-forest, ascends the naked rock, where an icy wind lashes ragged clouds through the unfurled air. Here, now where bare cliffs or jagged summits, cupped with snow, stare helplessly, he beholds, as far as the eye can reach, nothing but thick, uninterrupted forest, which everywhere covers the land. This forest assumes the most different aspects, according as the local conditions vary, and, by its endless variety, strikes the traveller with ever renewed astonishment and admiration.

THE QUINDIO MOUNTAINS.

A tolerable mountain-path leads from Ibagú, across the Cordillera de Quindío to Cartago. It is but a short time, since this Andean-pass has become fit for crossing with the mule, though still with much trouble and not without danger. Many native travellers prefer even now being borne across by Cargueros or Cargadores, whose step they deem safer and more convenient than that of the beasts of burden. These Cargueros are mostly Indians of an incredible strength and perseverance. For a small sum these poor fellows carry the traveller on a light Bamboo-chair which is fastened to their backs in the manner of a basket, up the steep, slippery paths across the impassable mountains.1 The mules, it is true, often choose the very brink of the path, running along precipices, and one is often compelled, in travelling over long tracts of the dense forest, to stoop low over the neck of the animal, for fear of being dragged down by overhanging branches and creeping plants. The magnificence of nature, however, is an ample compensation for all the hardships one has to undergo. The aspect of the landscape is absolutely grand. The mighty sides of the valley are clothed to their summits with dense primeval woods, and the brilliant snow-capped cone of Tolima rises giant-like into the clouds. Now, one rides along a steep declivity, covered but slightly with vegetation, through which foaming torrents are rushing; now one finds oneself amidst the profound darkness of the primeval forest, or in a narrow defile, arched over by graceful Palmettos.

1 Rev. A. Henschel, Via dellos Cordilleras.
The vegetation of the Quindia is declared to be one of the most vigorous, even by such travellers as are acquainted with other parts of the tropics. The landscape physiognomy acquires a special peculiarity by two species of Palms, rising high up the mountains; these are the Wax-palm (Ceroxylon Andicola) and the Oreodoxa frigida, a Palmetto. The former is perhaps the tallest species of Palm known; it forms straight trunks of 180 Par (10 Paris feet equal to 20 feet, 77 inches English feet high,) which on their surface produce an exudation of white dust; this, being scraped off and melted, yields a wax fit for giving light. This Palm, in dense forests, intermingled with laurel wood, attains a height of 8100 (Par.) feet above the level of the sea, when the lower boundary of the perpetual snow, in these valleys of the Andes, is at 14160 (Par.) feet.

The eye, if not veiled by the darkness of the forest, loves to look down the sunny dells, or to pursue the light clouds as they gather of an evening in the valleys, more along the declivities and are caught by lofty Palms. In the higher regions of the mountains the Wax-palm forms forests of a great extent, and, far as the eye can reach, the mighty ridges are here clothed with its white trunks, which, bursting forth from amidst the dark body roof of dicotyledonous trees affords the beautiful sight of a forest above a forest. 

[Observation: The plants marked in the text with * may be identified by referring to the Index and the plates accompanying it.]

Ad vol. 2.

A hollow above the Quindua del Tiche, about 6500 feet absolute height.

Moisture and shade, such as are met with in a narrow ravine, produce a particularly fresh and luxuriant vegetation. Here Heliconias* grow in great vigour; between them, tall Scolymus*, bearing leaves of three feet length. The slender Palmetto, Oreodoxa frigida, too, loves these shady spots and their trunks are thickly covered with the climbing fern, the Chippens scandens* (Bromeliaceae). The delicate Palms are shaded by the dense foliage of Lessichis dubia and other dicotyledonous trees. Besides the Scolymus, Tetraria* and gigantic Ardisia* are found growing, and here and there a fern-tree (Asplenium) lifts its leafy head. Everywhere creepers are mingling in the leafy trees, and hanging down in graceful tendrils. In the dark ravine a deep silence prevails, broken only by the loud drooping of water from the trees; for these forests are real confounders of the atmospheric moisture, and, even in sunny weather, are in a constant state of humidity, whereby a beautifully fresh and brilliant colouring is produced.

On the ground are seen, in a motley confusion, slender Ctenos (Euphorbiaceae), Octosia mollis, O. macrophylla (Lauraceae), Citrusia macrophyllum (Monimiaceae), Ardisia (Myristicaceae), Symphorea (Styracaceae), Aralia Quinduensis (Araliaceae),* Berberis Quinduensis (Berberidaceae),* Schindelia occidentalis (Sapindaceae),* Pachis Quinduensis (Oxalidaceae),* several Melanotus, for instance Melanotus cumanus, and Rhamnus (Rhamnaceae)—and herblike—several species of the Sylvia genus (Labiate), Bederia (Gesneriaceae), Mathias grandidifera, Espeletia grandidifera (Compositae),* Oxalis hedyosmoids, O. Schindelii and O. rupestris (Oxalidaceae) and Molina purpurea (Polygalaceae).*

Ad vol. 3.

Primval forest at an elevation of about 7000 (Par.) feet; in the distance Mount Tolima.

Mount Tolima, 17280 (Par.) feet high,* is the culminating point of the Quindia mountains, and, unless the Sierra nevada de Santa Maria prove higher, the most elevated summit north of the equator in America. Its conical shape shows it to be a volcano, and its activity as such is still in the memory of the inhabitants of that sea; even to this day it is said, according to the statements of the Indians, who collect brimstone by the sides of the mountain, to exhale vapours from some of its fissures.—The right of the perpetual snow makes a particularly strong impression, where it is seen in contrast to the abundance of tropical vegetation. Thus, Mount Tolima, where the forest suddenly begins to close, appears as in a frame of most luxuriant plants. The dazzling whiteness of the large masses of snow, and the deeply saturated verdure of the foliage, the glaring fields of ice and the exuance of alpine forest, as here viewed at one glance, form the most striking contrast.

These clear spots possess moreover an additional charm in their vegetation. Here, where the dense forest is interrupted by an unevenness of the soil, or by some still of water, the plants, which form the underwood, spring in a particularly beautiful development, while, in the thicket of the forest, they grow in an exuberant and chaotic manner, appearing often but as an irregular confusion of bouquets, leaves and blossoms of various hues and formations.

Somnus... grow here, and the Heliconia villasii, bearing a beautiful red blossom; young Wax-palms (Ceroxylon Andicola) and Palmettos (Oreoedra rigida) break vigorously forth through the underwood. Between them, trunks of Myrceylon (Leguminosae) and Urostigma (Araucariae) are rising, richly overgrown with Passion-flower (P. manieta, P. diffusa, P. longipes), with Aridea and Brunellia, and overshadowing graceful Ferns... Here, too, are found Piper muro, Pectenaria folia, Pometaria mollis (Piperaceae), Galrem piliferae (Rubiaceae), Soliva papyracea (Compositae), Lobelinia cernuus (Labiatae), and Salvia tortuosa (Labiatae); then Croton costatus (Euphorbiaceae), Witheringia rhomboidea and Witheringia rigida (Solaneae); Besleria umbellata, B. elegans, B. ciliata (Gesneriaceae); Citronus echinatum (Monimiaceae), and the Cyperaceae; Cyperus edulis, Cyperus peruvianus, Maruccia furax, Scirpus monstrosus. Then Pothos meyerioides (Aroideae), Bomaria forrestii (Asphodelaceae), Desdoina splendens (Solaneae).

Ad fid. 4.

Forest on the ridge between Bocas vista and the Quebrado del Toche, about 7000 (Par.) feet above sea-level.

The passage through the Quidiui mountains is almost continually up and down hill. Only on the top of the ridge, which rises above the Quebrado del Toche, the path, for a short distance, is tolerably even. Here we meet with a very beautiful forest of lofty trees, and in the flat hollows, which partly get filled with water in the rainy season, Palmettos and tree-form grow in a wonderful exuberance and vigor. The fronts of the young Oreoedra rigida here often attain such amazing dimensions, that, on comparing them with older specimens, one is scarcely able to identify them.

The Chuspa valleata is here frequently seen ramping in the trees, whose trunks, as well as the stems of Palmettios and Fern-trees, are covered with Brunellia and other ephyllaceous plants, wherever there is a spot left bare by the creepers. The underwood consists of Psychotria hisita (Rubiaceae) and Citronus peruvianus (Monimiaceae), intermixed with Somnus... and Aridea, which latter climb the very tops of trees.

Among the herbs we find Erythrum Humboldtianum (Umbelliferae), Ramuncula germantiana (Ranunculaceae), Hypericum stellatoides (Hypericaceae), Oxalis latifolia (Oxalidaceae); a highly graceful grass, Olyra arundinacea, and Scirpus trichoidea.

Ad fid. 5.

Definitely near the Alto de las Sepulturas, about 8000 (Par.) feet high.

In the cooler regions, at heights of 8000 to 9000 feet, the vegetation begins to thin. The growth of the trees and the underwood still continues vigorous; the creeping plants, however, appear no longer in the same abundance as rather lower down. Powerful trunks of Ceroxylon rise above the dark-leaved Oxid forest (Quercus Tomineana), Podecurrea tacidima and dendrophyllum (a yew-tree-like conifer) grow beside the Oreodora rigida, and the Guanana pilosa (Urticeae) projects its large, sharp, dark green leaves between Soliva sagittata (Labiatae); Petros Quinindum (Verbenaceae); Leuca papaverifolia (Lauraceae); Luma gigantea (Juglandaceae); Scirpus exigus (Cyperaceae); Melastoma rubiginosum (Melastomateae); Aralia jasminifolia (Araliaceae); Fuchsia Quinindum (Onagraceae).
constructed of rude trunks, and covered with Palm leaves, and, though open at the sides, yet it affords some protection against the sun, in a spot, where, in the absence of this shed, the wayfarer would have to pass the cool nights without any shelter against the inclemencies of the sky. The spot is called El Gallego. Immense steeply sloping mountain walls here form a valley of wonderful grandeur. Majestic Wax-palms rise from the depth, breaking through the dark foliage of the Oak-forest. The Oreodoxa rigida is here of a more slender growth than in the lower parts; its fronds however are not so rich and luxuriant. Alpinia, Eulaliopsis, angustifolians, E. Tuher (Eulaliopsis), Trigonis serrula (Trigoniserva), Thulaxalis, nabrunscuda and Th. laugolin (Vaccinium), Lycium genereidos, the beautiful shrub-like ike-leaved Desfumumia splendidus (Solomon) and Bocharta polygalalifolia (Desfontainia) cover the declivities with an abundance of shining green leaves and with a beautiful variety of blossoms. Tree-farms even here like to be shaded by larger trees. A species, nearly akin to our wild strawberry (Fraginae), grows on the ground with Limpedia mult sidelined (Loesner) and Rubus oxalides (Rubiales) while the graceful Passiflora clavata is climbing on the shrubs.

It is difficult, while staying in these lovely parts, to procure the necessary provender for the mules. They are usually left to themselves, two bars being drawn across the road at some hundred yards distance on each side from the shed, to prevent their running away. Though the forest they cannot escape, the underwood being too dense. The scanty grass on each side of the road is soon consumed, and they eat but reluctantly the leaves of the Cossaqua scounduns and some Palms, which the multitudes cut for them. Here companies of native travellers, coming from opposite directions, often meet in the evening. A large fire is then lighted outside the shed, and travellers have an opportunity of displaying their talents for the culinary art. Rice, Banana, Potatoes, and some game shot on the road form the ingredients of the repast, and savoury Cocoa refreshes the weary wanderer.

The groups of dark figures, which, chilly, and closely wrapped in their large Ponchos encircle the fire, present a lively picturesque appearance. The bold outlines of the surrounding forest stand out darkly against the sky, and the white trunks of the Wax-palms, glittering in the reflex of the reddish flame, are set off brilliantly by the darker sky and foliage.

Ad Vol. 7.

Oaks and tree-farms at a height of 6000 (Pvr.) feet.

The Quindiu mountains greatly abound in tree-farms. In spots, particularly favourable to their development, viz. on moist, shady declivities, most different species of them are often seen together on a small space of ground. Here a slim, nerved trunk rises to a considerable height, adorned with a few downy, tapering fronds, whose leathery-like, finely divided pinnae are of a dark hue (Cibotium), undescribed species; there, the shorter trunk, covered with brown fronds is furnished with a rich dense crest of decompound fronds, of a beautiful light green colour (Abelphia). In some species the fronds adhere to the trunk after having withered, forming closely beneath the crest, a thick dark reddish tuft, with which the light green of the younger shoots strikingly contrasts. In others, the young shoots are not unlike crosiers in their appearance (Balantia). A strong physiological contrast to the light, minutely pinnaed foliage of the Fems is formed by the heavy, broad leaves of the Cecropia, which, adhering to the tops of thin branches, protrude here and there through the foliage of Oakes and Cinchomanren (Cinchona pubescens).

The trunks in these regions are covered with Falcmin polygermus, Orthotrichum longirostrum (true Muscæ) and Anthurium myurus (Arondia), while Paspalum (P. longipes, P. diffusum) are rambling on low shrubs. The Calcia-species with their isolated leaves have a peculiar growth, being particularly striking where they appear among Podaroumers (Comifera), Oculea mollis (Lantus), Fuchia Quidiniums (Oxaprim), and other small-leaved bushes. A small Palm with broad pinnia (Camarosar) twines its thin annulated stem through the shrub, which here chiefly consists of Wilheringia rhomboides and W. riparia (Schim.), Ardisia Quidiniums (Aratia), and the winding Neteria mollis (Pupulose), while the ground is covered with Peleouin folium (Piperoce), Olyra arundineas (Gramineas), Salvia sagittata (Labiate), Luzula gigantes (Juncaceas), Espeletia grandifolia, Eupatorium fulgurinum (Compostaceas), Rhamnaceas Bumplibulinosus (Rhamnaceas) and some shrubby Gramineas (Boscia triloba, Boscia singoniana). A new species of Scrophulariaceae, nearly akin to our Veronica serpyllifolia, also grows here.

Forest in the Sierra de Osaña, about 2000 (Pers.) feet high.

[This plate, representing an aboriginal forest in the Sierra de Osaña (in the eastern chain) is here super- 
added to the series in order to convey an idea of the variety of vegetation in different parts of the Andes, 
though under similar circumstances. The place is situated under the eighth degree of northern latitude and 
on the western declivity of the eastern Cordillen, while the former plates represent forests on the eastern slope 
of the Quindio or middle chain.]

Though under circumstances quite similar to those, in which the Quindio past of Bagué is placed, the 
forests of the eastern Cordillen nevertheless greatly differ in their vegetation. The forests of the mountains 
between Osaña and the Parámo de Cacuta (or Cachira) abound in mighty Fern-trees (Cyanthine, Balansae), 
their trunks are often entwined with Corallodendron (Corallodendron funiferum), while larger Cyclothone 
(Cyclothone creaturum) shade the ground with their broad leaves. Of the Palmae growing here (a species of 
the Intrenta and the Geonoma undata), neither has the least resemblance to the Palmae of the Quindio. 
This Intrenta is particularly beautiful. Its trunk is of a dazzling white, thirty to forty feet high, of an arm’s 
thickness and furnished with long internodes. The sheath of the final fronds an upright continuation of the 
trunk itself, and the few fronds are regularly pinnaed, somewhat broader at their extremities, and end in 
a flabelliform, more or less truncated apex, that looks as if it were bitten off. This Palm is uncommonly 
generous; its stem always slim and straight, while the assimilated stem of Geonoma undata is always curved.

A deep shade is formed by the dense foliage of Anta Quindianensis (Acanthocarpus), Ladesbrega macrocarpa 
(Cinchonaee), Muxylus Talahífer (Grespinotii), and Ilexore Guaniensis (Myrsinaceae). Ananda cover 
the trunks of Gonopis lucens and the tendrils of Passiflora (F. glauca, Tacionis brevis) and Polygonum 
(Solmschen volubilis) render the wood impenetrable. Here and there a tall Sollum is seen rising and the 
hanks of the cool torrent are covered with beautiful Ferns (Dielsiäet).

It is not always either safe or easy to cross these rapid mountain-streams, now, sometimes it is impossible 
for weeks together to cross a river, which, at other times, appears but as a small rivulet. When, as consequence 
of heavy rains, the water is swollen, the Arrerios examine the ford with great caution, ere they venture into 
it with their animals. If it is found passable, the mules are unloaded and unburdened; several men, maintaining 
their stand in the rapid torrent only by clinging to each other, under much pushing and crowding make the 
reluctant beasts cross the stream, holding them by their heads and tails. Baggage and clothes are carried over, 
applied in the hands, to prevent them from getting wet, or they are transported over by a tree, laid across 
the torrent. Provided these crossings are not too troublesome, they generally form the gayest scenes, especially 
when the company is numerous and has many Indians in its train. The fresh bath is welcomed by the strong- 
limbed fellows and the labour is performed under shouts and jokes. The most odious situations often 
arise by the stubborn beasts refusing to take the right ford, or one of the company, in his zeal, stumbling over 
a hidden stone and disappearing for a moment in the floods. By broader and deeper waters, supra, made of 
leather straps or creeping plants, are found, by which the baggage is dragged across, while men and animals 
swim over.

The Magdalena River.

At Honda the river, amidst wild roarings, and rising in high waves, forces its way through a narrow defile. 
It is navigable for small craft even for a considerable distance above Honda, and, down the river, canoe, 
manoeuvred by able pilots, can pass the rapids of Honda. Upstream, however, boats and their cargoes have to 
be carried a long way by land, if they are to continue the journey up the river above Honda. The current is 
so rapid, that, while up stream the distance between the cataracts and Honda, under the most favourable 
circumstances, with a light canoe and at low water, takes at least six weeks; in the opposite direction it is 
performed in eight to twelve, or at high water even in five days. Freighted vessels require three months and 
upwards to perform the journey up. The distance in a straight line, without counting the numerous windings, 
is about 900 geographic miles (80 to a degree).

The voyage down has a great charm, while, in the contrary direction, it is very fatiguing and tiresome. 
Either bank is uninterrupted covered with mighty aboriginal forest. The river, whose water is very muddy, 
is not deep, but it is of majestic breadth, and towards its mouth, branches out into many arms. There are 
some only about thirty feet broad, and thinly overgrown with aquatic plants; others, again are very wide, and 
not clear the mouth, the river in many places has the appearance of an extensive lake with numerous islands.

Sand-banks abound in all parts of the Magdalena. Here the hideous Caimans bask in the sun, sometimes forty to fifty in one spot. At night, these very sand-banks serve the traveller as resting-places, and he is glad, after having spent the whole day in the narrow canoes, to stretch his weary limbs on the soft sands. Here great masses of wood have been piled up by the current in the wet season, and dried up by the sun after the retreat of the waters. They take fire by the least spark, and sometimes make enormous bonfires, which frighten the monkeys and other birds, that have their nests in the sand.

A river voyage in the dry season is very fit to give an idea of animal life in the tropics. Then the animals, from the bank of water in the forest, are compelled to come to the river's side. Herds of drall Monkeys move slowly along the tops of the highest trees; Parrots of all kind, sizes, and colours, from the small Perricote up to the Macaw, fill the air with their yelling shrieks. Topis, Guinea-jigs, Aguti and Armadilus people the underwood, and Iguanas are seen climbing over slender branches. Here and there a serpent lies coiled up on a bough, and Humming-birds, glittering in all the hues of the rainbow, whirr about the blossoms of the forest. Hoeco-fowl (Punjilí) and many other birds of the bun and peachant-tide tire the ear with their monotonous screams. The clumsy Tortoise plumbs sily into the water, and occasionally a Jaguar is seen quenching his thirst in the river.

Of water-fowls there are a great variety. Several species of Herons, Ibises, Spoonbills, innumerable quantities of Mews and many kind of Ducks are met with. At the river's mouth, near the sea-coast, the trees are covered with the large nests of Pelicans. At night the dismal note of howling Monkeys is blended with the roaring of the Jaguar.

This animal lives in fierce feud with the Caiman, and the traces of their struggles are often visible in the sand of the banks. The Indians relate, that, when the Jaguar is about to cross the river, he previously sets up a loud roaring, to scare away the Caimans, which then are seen quitting the banks and even the surface of the water, and crawling away into the nile. These monsters of the deep are in general very shy on hearing a noise, savage and dangerous as they are otherwise. Early in the morning thirty or forty of them are sometimes seen in a quiet bay, swimming slowly along the surface of the water. They move along imperceptibly, seemingly with open jaws; for suddenly the long head of the monster starts forth from the water, holding a large fish, while, all around, a great number of fishes, startled by the noise, bound up high out of the water. The Caimans in the muddy water bear much resemblance to huge floating trees, and this is supposed to deceive the fish.

The vegetation is magnificent. The eye is charmed by the variety of the outline of the forest, arising from its being composed of so many different kind of trees, which now appear as mighty sheaves on stout trunks, now, as in the instance of the Ximian, bearing light and flithy foliage on slender stems. Everywhere the trunks are thickly overgrown with creepers, winding their graceful tendrils from tree to tree and hanging down in beautiful festoons. The Guanacos, representatives of the Indian Bambous, are highly beautiful, appearing either in large independent groups or projecting their enormous cones from amid the thicket of the shore. They are distinguished by the regular curving of their cones, forming almost sections of a circle, and by their fine grasslike foliage.

The magnificent Palm red (Cocos hystrix) is found nearly all along the river, and, of smaller Palms, species of Bactris, and Astrocaryum. A slender Esterpe is met with near the mouth of the river Sogomar, and the beautiful foliage of Heliconias and strong ckeyes of Sucharum (S. contractum, S. dilatam), partly cover the banks.

Ad fol. 9.

Huts of Indians near Nari.

The huts of the native Indians continue to this day in the same state as they were described by the first discoverers of this part of the world. Stout Bamboo-canes, stuck perpendicularly into the ground and occasionally joined by tendrils of creepers, constitute the walls, and the roof is clefted with Palma-leaves. There are no windows, yet the huts are light and airy, the lattice-like walls freely admitting wind and sunshine.

The Indians of the Magdalena river have very little wants; their furniture is very simple. Some Tortoise-shells serve as dishes, a hollow stone is used for grinding meat and cacao. Spoons, large and small basins and cups they make of the fruit of the Tutuma-tree (Crescentia Cupe) and enormous pumpkins or calabashes are used as bottles and jugs. They are skillful hunters, though their implements are very primitive, being nothing but rudely cut bows, and arrows of enormous length, made of the stems of large Guamanias (Saccharum) and armed with points of bone or hard wood. With these they kill birds and fishes very dexterously, and the light

3 Keane, Syrups. pl. iv. p. 205.
The forests of San Agustín near Puerto de Ocamo.

The Magdalena receives the waters of many tributary rivers from both Cordilleras. Where they enter the plain, the vegetation is mostly particularly vigorous. The strong evaporation of the, as yet, cool mountain-streams, as it descends into the warmer regions, and the heat of the sun, reflected by the sides of the opening valley, produce a pressing-hot atmosphere, highly saturated with moisture, which is most favourable for the development of plants and insects, but unceasing and almost insupportable to men. The forest, here, bears distinct traces of the periodical inundations. The underwood is almost wholly wanting; close to the water; at a greater distance off are found: Eugenia ruscifolia (Myrtaceae), Psychotria Carthuginensis, P. lippifolia, Füremaniodorasima (Cichoraceae), Hirtella mollissima (Chrysobalanaceae), Inga Humboldtiana (Mimosae), Prunus pieta (Cunlifiraceae), Xylopia Beta (Vochysiaceae), the arboreous Irenes (Casimiroa, Rumi and Pavon) latifolia (Cichoraceae), and Ardila ferruginea (Myristicaceae). The fall of the river is still very rapid here, and by the destruction all around one may judge of the power, with which the swollen river effaces its waters over the banks. Powerful trees and mighty trunks of the Palma real (Cocos hystereus) are strown about in wild confusion, torn from their roots, and, here and there, barring up the river.

This Palma real is a most stately tree. Its trunk is rather stout, but its great beauty consists in the abundance and exuberance of its branches, which are about twenty-five feet long and closely garnished with long and narrow pinnae. The rhachis is strong and elastic, without being stiff and its gradual tapering towards the extremity causes a graceful nodding of the frond in the slightest wind. Monkeys venture a leap from great heights down on the top of these fronds, which being laid hold of by them, breaks live down. It is too elastic and yielding to hurt them. Sometimes the whole trunk is covered with creepers, rising pyramidal from the ground. In many places the trunk is encrusted by Calotretus sesuus (a Calycophyllum, called Matapalo or tree-cutter by the natives), which winds its strong branches serpent-like round other trees, and gradually kills them. Another ornament of the Palma real is a small Fern, which takes root generally immediately beneath the crown, in the remains of the withered fronds, and forms there a lovely fresh-green wreath, contrasting beautifully with the darker and more shadowed tint of the Palm fronds.

A slender Fan-palm (Lepidooxylon) grows here. Orchids and large Aroides cover the branches of Spondiun latera (Terebinthaceae), which is overgrown with Bomarea forstininsana (Amaryllidac), Passiflora

1 Krahnt, Sygna, pl. ir. p. 397. 2 Ibid. p. 397. 3 Ibid. p. 397. 4 Ibid. p. 397. 5 Ibid. p. 397. 6 Ibid. p. 397. 7 Ibid. p. 397. 8 Ibid. p. 397. 9 Ibid. p. 397. 10 Ibid. p. 397.
vinidiflora (Passalidium) and Echites trigus (Apocynum). Here and there oddly shaped trunks of Bombax
Mompumcote (Bombacine) and Phenacostepho demidoffe (Mora), the latter with heart-like exocarps of
the root, are seen rising. Fu黎r (Bromeliaceae), eight or nine feet high, stretch their long, narrow and
prickly leaves wide over the ground, and vigorous emes, as Oryza latifolia (Gramineae) cover the banks in
some places.

Aad 6d. 11.

Bay in the Magdalena River near S. Pablo.

Where the strong current strikes against promontories of the banks, it gradually washes away the sandy
soil. Trees are undermined and carried away. They are driven ashore in other places, and, in quiet water,
spectacle plants, animal and vegetable remains are caught between their branches, and, when rotten, with
the sand of the river form a slimy mud. This is strengthened by young shoots and fibers from the roots of
trees on shore. It gradually thickens, and, at the retreat of the water, becomes solid soil. Thus, in quiet bays, the
river continually adds to the bank, what it washes away at sharp angles and wherever the current is strong.

The woods consist here of Madura dictoria (Moree), Ribideopsis excelsa (Terebinthaceae), a Morus
akin to Maras cebitiffs, of Anysia pinata (Aspidaceae), Humitia petersenii and Humilia horridula
(Tillanea), Cupressus latifolia (Cupressaceae), Lertia apetila (Rutaceae). The slender white stems of a graceful
Eustera shine through the darkish green of the shrubs, among which are found Gramma tomentosa
(Bataniaceae), Bombusia Hartwegiana (Malphigian), Peyreae arniniata, Rondaletia brevipes (Cisto-maceae),
Tobusentonis granifollis (Apoecy), Callionymus seminaria (Verbascum), Anfia irminthia (Myristica),
Mimosa zigara (Mimoseae) and Pleusia Hartwegii (Solanum), and among the herbs Gesneria erinna and
G. spicata (Gesneriaceae), Apiculanda Hartwegi (Acanthaceae) and Cassia Motschulsky, a Cauatipinos
furnished with thick, tertiary, expanding hairs. Bambusa (Guadua angustifolia) stretches its long cane over
the water and stony reeds (Sacharum continentum, S. dubium) render the banks in some parts insusceptible.

Aad 6d. 12.

A branch of the Magdalena River near Bogota.

Guaduas, representing the Bambuseae of India, are met with both in the hot plains and in the mountains.
The largest and most beautiful kinds, however, prefer a moist and hot atmosphere. The cane grows to a
height of forty-five to fifty feet; all the branches and twigs are perfectly developed before the leaves appear.
As it grows older, the cane bends gradually down to the ground till it withers. Narrow anns of the river,
called cahs by the natives, are often totally washed over by the waves, and the broken light, entering through
the delicately waved roof of the grass-like fringes, has an almost magic effect. The cane, set like darkly
against the transparent leaves appear not unlike the ribs of a gothic vault.

In this part of the river a species of Willden, probably Soffia Humboldtiana, is rather of frequent
occurrence; here and there it covers the banks, and small lakes are totally overgrown with it. A thorny
Astronium is found in the thicket of the shore between Inga coraei (Mimosae) Armithe tuberculata
(Piperaceae), Mimosi Bogotanii, Mimosi Steinbeckii (Compositae), Rondaletia erinna (Cisto-maceae), Cordia
allidota (Cordaceae). Of herbaceous plants occur Angulina silico-melodia, Capua biloba (Scrophulariaceae),
Hydrilla spinosa (Hydraceae), > Sida aracu (Malvaceae), and the floating Junias sedoidae (Oxalidaceae).

Aad 6d. 13.

Banks of the Magdalena in the neighbourhood of S. Pedro.

The margin of the forest on the river side generally consists of a thick hedge of luxuriant shrubs,
intermingled with cane and small thorny Palms. Croton albinus (C. leptostachyus [Euphorbiaceae], C.
Chamaeeserus (Amaranthaceae) and a great many creepers under the thatch insusceptible. Helycosperna1
Kunth, Symp. pl. vol. iv. p. 576. 2 Ibid. p. 205. 3 Ibid. p. 194. 4 Ibid. p. 357. 5 Ibid. p. 196. 6 Ibid. p. 357. 7 Ibid.
delight the eye with their fresh verdure and lovely blossoms, and Panicum trichoides and Echinodorus pumilus cover the ground, intermixed with Aplochiton pectinatus, Dipenteranthus leucanthus, Scrophularia Hadleyggenii (Amaranthaceae), Dendrocnos Contaiva (Morea), Pothos rostrata and some other Orchids, and the charming Alpinia occidentalis (Amaryllidaceae). Having penetrated through the thicket of this hedge, the forest is found comparatively clear of underwood, but the growth of the trees, as Theobroma brolor (Bignoniaceae), Lycidina dubia (Lycidinaceae), Guettan speciosa (Myrtaceae), Cercopis Hamboldiana (Araliaceae), Spiran mullis, Matisia aculeata (Celidaceae), Sapium officinale (Kopchorinaceae), Coccoloba nida (Polygoneae) and Pharmacosycea antillaniusia (Morea) is enormous. The slender stem of an Euterpe offers a striking contrast to the big trunk of the Palm real. Many trees are so thickly covered with creepers, that it is impossible to make out their original foliage.

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A view from the slope of the eastern Cordillera, on the road from Santa Fe to Bucaramanga, at a height of about 5000 feet, looking to the west. In the centre is seen the village of San Juan, in the distance the river Magdalena and in the extreme background the Cordillera de Guadua with its summit Tepanee and Mass de Crato.

I. Cecropia viitana. (A Fijá.)
II. Oreodoxa frigida.
III. Anodendron.
IV. Schima.

V. Vochysia. (A Fijá.)
Besides these we also find in this place Bactea (Hookeriana), the Camellinian xenox, the Peruvian Guatamatana (Guatamatana), the Hebe toxóla, Melastoma Meligo, M. serrata, M. solvay, M. serrata (Melastamum).
VI. Mass de Crato.
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PLATE 2.
A hollow above the Quebrada del Toro, about 3900 (Par.) feet above sea.

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V. Schima.
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PLATE 3.
Prismatic forest at an elevation of about 5000 (Par.) feet; in the distance we see Tejera.

I. Heliconia viitana.
II. Oreodoxa frigida.
III. Anodendron.
IV. Taxod, Cyparis.

V. Schima.
VI. Chamaedorea.
(V. American Fijá).
VII. Mjornyilia.
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PLATE 4.
Forest on the ridge between Brama viala and the Quebrada del Toro, about 7000 (Par.) feet above sea.

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IV. Astasia intemata.
V. Schima.
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IV. Bechsteinii (Taxod). Oak.
V. Alpina.

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III. Chlorophora (reduced species). Taxod.
IV. Clorophora.
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VI. Tomadors: Baxostian.
VII. Taxod: Alpina.
VIII. Carya.
IX. Alpina.
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VII. Tree-fern: Balantium. VIII. Solanum. IX. Dicksonia. X. Shrubs entwined with creepers, such as Securidaca volubilis, Tacsonia lanata, Passiflora glauca etc.

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