W. Firth. del. et lith. from a sketch by T. Woollward.

Printed by Frederic Reeve

THE ICE CLIFFS
in
Kotzebue Sound.

THE BOTANY

OF THE

VOYAGE OF H.M.S. HERALD,

UNDER THE COMMAND OF

CAPTAIN HENRY KELLETT, R.N., C.B.,

DURING THE YEARS 1845-51.

Published under the Authority of the Lords Commissioners of the Admiralty.

BY

BERTHOLD SEEMANN, PH.D., F.L.S.,

MEMBER OF THE IMPERIAL LEOP.-CAROLINE ACADEMY CURIOSORUM, AUTHOR OF 'THE NARRATIVE OF THE VOYAGE OF H.M.S. HERALD,' 'POPULAR HISTORY OF THE PALMS AND THEIR ALLIES,' ETC. ETC.,

Naturalist of the Expedition.

WITH ONE HUNDRED PLATES.

1-10, 13-52
2 Supp. 1-12.

"A TRAVELLER SHOULD BE A BOTANIST, FOR IN ALL VIEWS PLANTS FORM THE CHIEF EMBELLISHMENT."

Charles Darwin.

Mo. Bot. Garden.
1893

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TO

CAPTAIN HENRY KELLETT, R.N., C.B., ETC.,

BY WHOSE FRIENDLY ASSISTANCE AND READY CO-OPERATION

THE MATERIALS DESCRIBED IN THE FOLLOWING PAGES

WERE COLLECTED,

THIS ACCOUNT OF THE

Botany of the Voyage of H.M.S. Herald

IS DEDICATED,

WITH FEELINGS OF HIGH RESPECT AND ESTEEM, BY

BERTHOLD SEEMANN.

PREFACE.

A GLANCE over the pages of this Work will be sufficient to show that, although H.M. Ship Herald visited many little-known regions of the globe, and brought the Author into districts never before, or but partially, explored, the number of new genera and species obtained was extremely limited, and old, well-established ones formed the great bulk of the collections,—a peculiarity still more apparent when compared with the results of previous voyages and travels of a similar nature. Two chief reasons must be advanced to account for this singular fact. On the one hand, it cannot be denied that only a few, very few districts of this planet present any considerable amount of novelty; on the other hand, I enjoyed, in the determination of my harvest, the advantage of free access to the largest Herbarium in the world, that which the liberality of Sir W. J. Hooker has thrown open to the scientific public; an advantage enabling me to identify most of my plants with already described ones, and preserving botanical literature from a series of synonyms with which, under less favourable circumstances, it must and would have been hampered; for however necessary and useful good books and plates are in determining and establishing the correct position of plants, it is only after consulting extensive Herbaria that any conscientious mind nowadays ventures to launch new genera and species on the troubled waters of systematic botany: hence what at first would appear an unfavourable feature, will on second consideration prove perhaps one of the best recommendations of this Work.

I have now to express to Sir W. J. Hooker my heartfelt thanks for admitting me, in common with many other men of science, to the privilege of consulting his valuable private collections, and at the same time beg leave to assure him that the assistance I received from him will ever be remembered with feelings of sincere gratitude. It is also my pleasing duty to return my best thanks to Dr. J. D. Hooker, who, by undertaking to furnish the analyses to the Plates, has given to this Work a value which raises it far above the level it would, without this advantage, have attained, and who, by his ever-ready and kind aid, saved me from many a quicksand into which I should otherwise have fallen. I am no less proud of being able to allude to various other great names who have conferred upon me the honour

of connecting themselves with me in the present undertaking, and whose labours will confer a lasting value upon it, however small the merit that may be ultimately assigned to the parts worked up by myself. The writings of Nees von Esenbeck, Bentham, Grisebach, Klotzsch, Steetz, Schultz Bipontinus, Churchill Babington, Reichenbach fil., Wilson, J. Smith, Harvey, Mitten, and Miers, are so deservedly esteemed, that nothing further will be required to bear out the justness of this remark, and it only remains for me to express my sincere thanks for the generous and highly welcome assistance they have afforded me. Finally I have to record my sense of gratitude to Mr. W. Fitch, the talented artist who supplied the drawings to most of the plates, and lithographed them in the spirited manner so peculiarly his own.

With the exception of the collections formed in Ecuador, Peru, Kamtchatka, Singapore, and the Island of Aor, Sumatra, the Sandwich Islands, at the Cape of Good Hope, St. Helena, and Ascension, all the plants gathered have been enumerated; and had the limits originally assigned to this Work not already been considerably exceeded, or had the funds placed at my disposal permitted a further extension of these pages, I should have preferred publishing at this place what now must find its way to the public eye through the channels of scientific periodicals.

In concluding this Preface, and at the same time terminating the editorship of the three Works (the Narrative, the Zoology, and the Botany), the publication of which, on the recommendation of Sir W. J. Hooker, was entrusted to me by the Lords Commissioners of the Admiralty, my thoughts linger with fondness on the fine voyage, the fruits of which are now before the public; and on the many happy hours spent on board H.M.S. Herald: and, when I search for the cause that has made the voyage so productive, it is to be found in the peculiar talent Captain Henry Kellett had for turning every circumstance to account, for by his own example he stimulated the officers and men under his command to that energetic action which has borne such valuable fruit, and has led to results which render the Voyage of H.M.S. Herald, under his command, an event as memorable in the annals of Science as in those of Navigation.

BERTHOLD SEEMANN.

London, October 10, 1857.

FLORA

OF

WESTERN ESKIMAUX-LAND.

SUMMARY OF THE VOYAGE.

H.M.S. Herald, under the command of Captain Henry Kellett, C.B., accompanied by H.M.S. Pandora, Lieutenant-Commander James Wood, sailed from Plymouth Sound on the 26th of June, 1845. She sighted Cape Finisterre, Porto Santo, and Madeira, and on the 13th of July anchored off the town of Santa Cruz, island of Teneriffe. After a stay of two days the voyage was continued. On the 6th of August, latitude 2° 32′ south and longitude 30° 53′ west was reached, where the depth of the sea was measured and found to be 2995 fathoms. On the 9th of August the island of Fernando Noronha was in sight, and on the 19th of the same month the ships entered the Bay of Rio Janeiro. Leaving that port on the 28th of August, the Herald and her tender directed their course to the Falkland Islands, and having remained a few days at that group, steered southwards. On the 4th of October the cold was found to be intense, and at daybreak it was discovered that the Herald was under the lee of a large iceberg, and that the Pandora was out of sight. After going as far south as 59° 24′ S., and encountering all those obstacles for which the passage around Cape Horn is notorious, the Herald reached the Bay of Concepcion, and on the 14th of November Valparaiso, Chili, where the Pandora had arrived a fortnight previously, and where, as well as from Pichidanque, the Aconcagua, the highest summit of the Andes, was measured, and proved to be 23,000 feet above the sea. The next port visited was that of Papudo. On the 7th of December, Captain Kellett again steered northward, and touching at Callao, Payta, and the Gallapagos Islands, anchored on the 22nd of January, 1846, off the river Sua, Ecuador. It was here that the expedition was deprived of its zealous and able naturalist, Mr. Thomas Edmonston, who, after returning from a botanical excursion, was killed by the accidental discharge of a rifle. The river Esmeraldas having been visited, Captain Kellett commenced surveying the Bay of Choco, a labour interrupted, in the middle of March, by the heavy rains, which compelled the vessels to make sail for Panama.

On the 16th of April the expedition left the Bay of Panama, and on the 13th of June reached the Fort of Victoria, Vancouver's Island. The months of July and August were occupied in surveying the Straits of Juan de Fuca, and on the 19th of September the ships departed for San Francisco, California. After a stay of a few days in the gold country, the voyage was continued. Various islands of Lower California, Magdalena Bay, Matzatlan, and San Blas were visited, and on the 5th of December the vessels anchored off the town of Sijuatenejo. War between North America and the Republic of Mexico being at its height, Captain Kellett and several officers and seamen, having been mistaken by the Mexicans for citizens of the United States, were detained as prisoners until the 12th of December. Having paid a visit to Acapulco, and measured some of the volcanoes of Guatemala, the vessels sailed for Panama, where they arrived on the 17th of January, 1847, and were joined by Mr. Berthold Seemann, who had been sent out to fill the vacancy occasioned by the death of Mr. T. Edmonston, and who had been exploring since September, 1846, various districts of the Isthmus of Panama.

Until the end of April the ships were employed surveying the Bay of Panama, and then sailed for Callao, where, after touching at Payta, they arrived on the 28th of June. The Herald remained in that port until the 23d of July, when she proceeded to Payta, where Messrs. Berthold Seemann and Bedford Pim started on a journey which led through the Peruvian deserts, and the towns of Piura, Loja, and Cuenca, to Guayaquil; the Herald meanwhile surveying the river Guayaquil. After the completion of that task Captain Kellett steered northwards, visiting Punta St. Elena, Salango, Manta, Punta Galera, the river Sua, Tumaco, and the Bay of Choco, everywhere pursuing the object of his mission. On the 14th of November the Herald reached the island of Flaminco, Bay of Panama, and continued the survey of the Bay. On the 5th of February, 1848, the task was finished, and thus completed the entire survey of South America. The remaining portion of the dry season was occupied in surveying the island of Coyba and the adjacent shores, and on the 24th of April the Herald returned to Panama roads.

The Herald up to this time had been a surveying vessel, she was now to enter upon a new career, that of a relief ship. The fate of Sir John Franklin beginning to excite apprehension, Captain Kellett received orders to proceed to the Polar seas in order to co-operate with the vessels composing the Relief Expedition. Towed by H.M. steamer Sampson, the Herald left the Bay of Panama on the 9th of May, 1848, sighted Bird Island, a rock of the Hawaiian Islands, and after a tedious passage of ninety-two days, entered Petropaulowski Port, Kamtschatka. On the 14th of August she resumed her voyage, touched at Michaelowsky, Norton Sound, and on the 14th of September anchored off Chamisso Island, Kotzebue Sound. She remained upwards of a fortnight in the Sound, awaiting the arrival of H.M.S. Plover, but as no tidings of that vessel were obtained, she departed for the south, surveyed the island of Guadaloupe, and visited Matzatlan, where Messrs. B. Seemann and R. Pakenham made an excursion to the Cerro de Pinal. After a stay of a few days the

Herald departed for Panama, and arrived at that place on the 19th of January, 1849, after having been absent eight months.

Not being able, on account of the cholera, to stay at Panama, several days were spent at Taboga. The survey of the coast of Veraguas was then resumed. Mr. B. Seemann meanwhile, disembarking at Remedios, made a journey in the western districts of the Isthmus of Panama. On the 19th of March the vessel left the coast of Veraguas, and on the 9th of May entered the harbour of Honolulu, Oahu, where she remained till the 19th of the same month, and then again directed her course towards the north in search of Sir John Franklin. Expecting to obtain some information of H.M.S. Plover, she went to Petropaulowski Port, Kamtschatka, where she found the Nancy Dawson, a schooner equipped by the late Mr. Robert Shedden, for the purpose of discovering some traces of the lost voyagers. Nothing having been heard of the Plover, the Herald without loss of time went on her passage, and having passed Behring Strait, reached, on the 15th of July, Chamisso Island, where the Plover was met with.

On the 19th of July, the three vessels, Herald, Plover, and Nancy Dawson, left Kotzebue Sound. They passed Cape Lisburne, Icy Cape, and on the 24th of July anchored off Wainwright Inlet, whence Lieutenant Pullen started for the Mackenzie River. The Herald and Plover now made a bold start for the north, and obtained on the 26th of July the first sight of the packed ice. The ice was traced by both vessels, until, after having attained latitude 72° 53′ north, 90 miles nearer the Pole than had previously, from this side, been reached, their progress was impeded by vast fields of ice. Prevented from proceeding northward, the ships returned to Wainwright Inlet, whence, after a brief stay, they sailed, and shortly after separated. The Herald steered for the Asiatic side, and on the 17th of August had the good fortune to add a group of islands to the list of Arctic discoveries. Touching at several places on the American shores, Captain Kellett steered for Kotzebue Sound, where he arrived on the 2nd of September, and found both the Plover and boats. The short time the weather was still mild was occupied with exploring Eschscholtz Bay and the river Buckland. Several days were spent at Elephant Point, and by the exertions of Dr. John Goodridge,—who throughout the voyage was zealously devoted to Natural History,—and Messrs. J. Hudsishon, B. Seemann, and the late T. Woodward, a considerable collection of fossils was made, and the nature of the ice-cliffs investigated. Leaving the Plover to winter in Kotzebue Sound, the Herald departed for the south and arrived at Matzatlan, Mexico, in the beginning of November.

While the Herald was surveying the Gulf of California, Mr. B. Seemann made a journey in the interior, which conducted him through the States of Sinaloa, Durango, and Jalisco. On the 4th of April, 1850, the ship left the coast of Mexico, and arrived at Honolulu, Hawaiian Islands, on the 6th of May. On the 28th of the same month she quitted the islands, and, having sighted the coast of Kamtschatka, reached on the 15th of July the anchorage off Chamisso Island. Orders for continuing the search for Sir John Franklin's Expedition

having been received, H.M.S. Plover at once entered upon their execution by starting for the north; the Herald followed. The Herald during this summer was chiefly confined to the neighbourhood of Cape Lisburne, in order to await H.M.S. Enterprise and Investigator. The latter made her appearance on the last day of July, and without delay started for the ice. After visiting various places on the coast of America, the Herald on the 4th of September entered Port Clarence, where the Plover and Enterprise were met with. Having assisted the Plover in preparing her winter quarters in Grantley harbour, the Herald departed, and on the 16th of October arrived at Honolulu. She thus completed her third and last voyage to the Arctic Ocean; she had used every endeavour to rescue the unfortunate navigators, but was mortified to find that after all her exertions she had failed to accomplish the great object of her mission.

On the 30th of October, after a stay of a fortnight in the harbour of Honolulu, the Herald commenced her homeward voyage, by bidding adieu to the Hawaiian Islands. Wafted along by the N.E. trade-wind, she arrived, on the 19th of November, in sight of the island of Assumption, passed Formosa and the Bashee group, and reached, on the 1st of December, the harbour of Victoria, Hong-Kong. Several of the officers made an excursion to Canton. On the 22nd of December the voyage was continued. After calling at the island of Aor, the Herald reached Singapore, where she remained till the 9th of January, 1851. In passing through the Straits of Sunda, a party effected a landing in Sumatra. On the 16th of January the Herald entered the Indian Ocean; she sighted the island of Keeling, and on the 6th of March anchored in Simon's Bay, Cape of Good Hope. The next places visited were the islands of St. Helena and Ascension, where excursions were made. Leaving, on the 20th of April, Ascension, and sighting, on the 20th and 21st of May, the islands of Flores and Corvo, two of the Azores, H.M.S. Herald arrived, on the 6th of June, 1851, at Spithead, whence she was ordered to Chatham to be paid off.

Thus was completed a voyage which will ever remain remarkable. There are few ships that have gone, in an equal space of time, over so extensive a portion of the globe, furnished a greater amount of hydrographical data, or brought together a more extensive collection of objects of natural history and important observations, than H.M.S. Herald, during the years 1845–51.

H. T.

This copy has the corrected pages
inserted.

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MAP OF WESTERN ESKIMAUX-LAND, AND THE ADJACENT COUNTRIES AND SEAS.

The coloured portion ▭ shows the district over which the FLORA of W. Eskimaux-land extends.

UNEXPLORED REGION

ASIA

AMERICA

BEHRING STRAIT

Kotzebue Sound

Kouliountchin Bay.

Kresta Gulf

ANADIR GULF

Norton Sd.

Icy Cape

East Cape

C. Yakan

C. North

C. Lisburne

Hope Pt.

Point Barrow

C. Smyth

C. Simpson

C. Halkett

River Colville

Franklin Pt.

Peard. Bay

Wainwright Inlet

Kotzebue Inlet

Hotham Inlet

Escholtz B.

Chamisso I.

Buckland R.

Cape Prince of Wales

Cape Clarence

Rodney Pt.

Port of St Michael

Cape Denbigh

Cape Stephens

C. Romanzoff

Cape Thaddeus

C. Tchaplin

C. Tchoukotzky

St Lawrence I.

Gore I.

Pinnacle Rock

Mt. Cory Bear

Mt. Robinson

Franklin Range

Romanzoff Chain

Beaver Mountains

Mountain Mun R.

Russian Fort

Trading Fort

Northern Boundary of the woods.

Mts seen by Wrangel

Mts seen by Herald

Herald I.

Plover I.

Appearance of Land

Collinson Aug. 29th 1850.

Packed ice 1849.

Packed Ice 1847.

Skeal

Coast of Wrangel in 1822.

C. Chalagsk.

R. Pakhlaya

R. Elkaout

R. Tchaeune

Ouvaian

Pt Emma-en

R. Ekichtagh

C. North

Estoutchemé

Takeka

C. Onemane

Burney I.

C. Serdtzy

R. Anadir

Lake Nerpatchie

Lake Baressouskey

Onemen Bay

C. Opoukinskey

C. Pakhatchinskey

Curel B.

Pt Emma

Michigme R.

Mulgrave Hills

C. Krusenstern

River Noatak

Escholtz R.

Trading Fort

Russ.n Fort

Fort of St Michael

Beaver Mountains

Mountain Mun R.

Franklin Range

Romanzoff Chain

Mt. Robinson

Mt. Cory bear

Northern Boundary of the woods.

170 180 170 160 150 140 130

80°

75°

70°

60°

East and 180 West of Greenwich. 170 160

Cl.t Achilles, lith.

Erskine Reeve, imp.

FLORA

OF

WESTERN ESKIMAUX-LAND.

HISTORICAL NOTICE.

Western Eskimaux-land has only been discovered in modern times, and its interior still remains an unknown country. The endless moorlands, the severe climate, and the icy seas of the Arctic regions offered no temptation to the earlier adventurers; and while navigation remained in its infancy the exploration was both irksome and dangerous. When, however, improvements in ship-building had been introduced, and knowledge increased, several expeditions towards the North Pole were undertaken, and attempts made to shorten the route to India by discovering a north-west passage. With a perseverance, a daring unparalleled, Davis, Frobisher, Hudson, and Baffin steered their frail barks between the icy masses, and laid open coasts, seas, islands, the existence of which had previously been a matter of conjecture and uncertainty. By degrees Europeans became familiar with the north-eastern coast of America; but they remained in total ignorance of the north-western. The Pacific Ocean was in the hands of a people who regarded all others as intruders, if venturing beyond a line of demarcation which Papal authority had thought fit to draw from pole to pole; the distance of the Arctic region was far greater than on the eastern side, and the obtaining of supplies more difficult. No wonder that, after the discovery of the South Sea, a hundred and thirty-five years should have elapsed before attempts were made to penetrate into the higher northern latitudes.

Russia was the first power that entered the field of discovery. In 1648 seven vessels were equipped at the mouth of the river Kolima: four of them were lost soon after starting, and though three passed Behring's Strait, and succeeded in reaching the Gulf of Anadir, their journals were so imperfect that little increase of geographical knowledge resulted from the voyage. No further attempts were made until 1728, when Vitus Behring, a Dane, was placed in command of a Russian vessel. He navigated through the strait now bearing his name, sailing as far north as 67° 18′ 0″. He did not sight the coast of America, but was

satisfied that the Old and the New World were disconnected. It was reserved for the illustrious Cook to obtain the first view of the north-west coast, and to set the question finally at rest. In the hope of finding the North-west Passage, Cook in his last voyage sailed for Behring's Strait, discovered Cape Prince of Wales, and accurately determined the distance between Asia and America. Elated by success, he pushed forward, till, in latitude 70° 44′ north, the packed ice stopped his progress. Hydrographical discoveries were not the only benefit resulting from the enterprise. Botany obtained its due share of attention. David Nelson, who, like Dr. Solander and Sir Joseph Banks on former occasions, accompanied the vessels, collected a number of plants, and thus laid the foundation of our present knowledge of the Flora. A long interval succeeded before the vegetation was again investigated. In 1816, however, Otho von Kotzebue, a German, sailed in a Russian ship, 'The Rurick,' for Behring's Strait, and discovered the Sound since denominated after him. Chamisso, Chloris, and Eschscholtz accompanied the expedition, and by their exertions, especially by those of the former, the naturalist of the voyage, considerable collections of plants were made, in Kotzebue Sound and the adjacent coast, which afterwards were published by Chamisso and Schlechtendahl in various volumes of the 'Linnæa.'

The discovery of the North-west Passage had lain dormant during the wars subsequent to the first French revolution. When, however, peace had been established, and the agitation abated, the British Government despatched several expeditions to the Arctic regions, and it was in order to cooperate with one of them that, in 1826, H.M.S. Blossom appeared in Behring's Strait. Though the principal object of that vessel was frustrated, science was allowed to profit by the mission. An additional piece of coast was discovered, and Collie, the surgeon, as well as several other officers attached to the expedition, collected a number of plants, since made known by Sir William J. Hooker and Dr. Walker Arnott, in their great work, 'The Botany of H.M.S. Blossom.'

Though the numerous attempts to discover the passage had failed, still hopes of ultimate success were entertained. In May, 1845, H.M.S. Erebus and Terror, under the command of Sir John Franklin, left England. After a reasonable time had elapsed, without the vessels returning, or any intelligence of them reaching home, the Admiralty deemed it necessary to adopt measures for their relief. In 1848, H.M.S. Enterprise and Investigator were sent to the eastern, H.M.S. Herald and Plover to the western side of America, to endeavour to discover traces of the lost voyagers. The author had the good fortune to hold at the time the office of Naturalist of the Herald, and during 1848, 1849, and 1850, he took advantage of every opportunity to explore Norton Sound, Kotzebue Sound, the River Buckland, Cape Lisburne, Herald Island, Wainwright's Inlet, and other localities. The Florula of Western Eskimaux-land may be considered as the result of his labours, as well as a summary of all that which, in these parts, the zeal of Nelson, Collie, and Chamisso had collected, the learning of Schlechtendahl, Hooker, and Arnott has elucidated.

INTRODUCTION.

In the extreme north-western portion of America, on the eastern side of that sea which divides the Old from the New World, lies Western Eskimaux-land, a country extending from Norton Sound to Point Barrow, from latitude 65° 0′ 0″ to 71° 28′ 0″ north. It presents a coast line of about 1000 miles in length, and is chiefly situated within the Arctic circle. The sea washing the shores is shallow, seldom exceeding twenty-five fathoms in depth, and dangerous to navigate. With a southerly wind, the cold air of the north and the warm of the south are brought in contact. A dense fog is produced, the wind increases to a gale, and the waves, from the shallowness of the water, are short, and vomit masses of foam. With a sluggish compass, no astronomical observations sometimes for days, a little-known sea, and the continued fear of running against drifting masses of ice, the seaman is struggling against difficulties over which his skill can exercise no control. Suddenly the wind shifts into a northerly direction. The fog vanishes, the sky becomes cloudless, and the water, within the space of a few hours, is as quiet as it had been violent. The Arctic Ocean is now in repose; whales are blowing in every direction; walruses are drifting on shoals of ice; flocks of eider-ducks, gulls, divers, and puffins enliven the scene; seals are playing in the watery element.

The bottom of the ocean is abounding with shells, starfish, crabs, shrimps, and with algæ of a delicate texture and of a greyish colour. Until the end of May the sea is frozen; in June the ice is thawing and drifting away. The navigator, without much difficulty, is now enabled to reach the latitude of 69°. Encouraged by success, he pushes northwards, attains the 70th, the 71st, the 72nd parallel; but at last, wherever he turns, icy masses beset him. Still persevering, he steers his bark through narrow lanes of open water, till, in latitude 73° north, all progress becomes impossible;—he has arrived at the barrier where human discoveries have terminated, where the sober knowledge of facts is superseded by a vague system of conjecture, and our maps show a blank. Beyond that boundary some see a wilderness, huge icebergs piled one upon the other, and glaciers incapable of supporting

either animal or vegetable life; while others, taking a more favourable view, look upon the barrier as masses hanging to a circle of islands, and try to establish the existence of a Polynia—an open sea around the Pole, with a comparatively mild climate and its attributes.

The coast of Western Eskimaux-land, after describing Norton Sound, projects into a peninsula, which, in conjunction with the eastern shores of Asia, forms Behring's Strait. The distance between the continents in these parts is so small that, in passing through the strait, both Asia and America are visible at the same time,—a spectacle only equalled in grandeur by that of beholding the Pacific and Atlantic Oceans from the mountains of Central America. From the peninsula the coast makes a deep curve, forming Kotzebue Sound, and then stretching towards the north-west, it again projects at Cape Lisburne, in latitude 68° 52′ 6″ north. Cape Lisburne is composed of two promontories, the south-eastern of which rises to the height of about 1000 feet. Imaginative minds have suggested that at one time Asia and America were connected. Without indulging in similar speculations, it is impossible to look at a map without being struck with the parallel direction in which the shores of the two continents are running, and, if pushed together, how nicely East Cape would fit into Kotzebue Sound, and Cape Tchaplin join to Cape Prince of Wales. From Cape Lisburne to Point Barrow the land is almost a continued flat, and the coast, falling back to the north-east, forms Icy Cape, Wainwright Inlet, and ultimately Point Barrow, the northern extremity of Western America.

A few islands may be said to belong to this region. Off Norton Sound there are Egg, Sledge, and Besborough Islands; a short distance below Behring's Strait, St. Lawrence; off Port Clarence, King's Island; and between Cape Prince of Wales and the eastern promontory of Asia, the Diomedes, three islands most appropriately named, for the albatross, after venturing from the northern confine of the tropic of Cancer, stops short at the Diomedes, making the very group bearing its name the northern limit to which its migrations extend. In Kotzebue Sound lies Chamisso Island, an everlasting monument to the memory of an illustrious poet and naturalist, towards Point Barrow the Sea-horses, and almost midway between Asia and America, about latitude 71° north, Herald and Plover Islands, portion of a group as yet imperfectly explored.

The country has many rivers, but none of any great size, and, owing to the flatness of the region, all are sluggish. The Koeakpack, one of the largest, takes its rise in the north, and running in a southerly direction, empties itself into Norton Sound. The Tokshuk, Kowala, and Buckland are smaller streams encumbered with shallows, and running north into Kotzebue Sound. The Noatak and Wainwright run in a southerly direction, and are, like the latter, unnavigable any distance even for large boats.

The soil is always frozen, and merely thaws during the summer a few feet below the surface. But the thawing is by no means uniform. In peat it extends not deeper than two feet, while in other formations, especially in sand or gravel, the ground is free from frost to the depth of nearly a fathom, showing that sand is a better conductor of heat than peat or

clay, and corroborating the observation of the accurate J. D. Hooker, who, after a series of experiments in India, arrived at the same conclusion. The roots of the plants, even those of the shrubs and trees, do not penetrate into the frozen subsoil. On reaching it they recoil as if they touched upon a rock through which no passage could be forced. It may be surprising to behold a vegetation flourishing under such circumstances, existing independent, it would seem, of terrestrial heat. But surprise is changed into amazement on visiting Kotzebue Sound, where, on the tops of icebergs, herbs and shrubs are thriving with a luxuriance only equalled in more favoured climes. There, from Elephant to Eschscholtz Point, is a series of cliffs from seventy to ninety feet high, which present some striking illustrations of the manner in which Arctic plants grow. (See Plate I.) Three distinct layers compose these cliffs. The lower, as far as it can be seen above the ground, is ice, and from twenty to fifty feet high. The central is clay, varying in thickness from two to twenty feet, and being intermingled with remains of fossil elephants, horses, deer, and musk oxen. The clay is covered by peat, the third layer, bearing the vegetation to which it owes its existence. Every year, during July, August, and September, masses of the ice melt, by which the uppermost layers are deprived of support and tumble down. A complete chaos is thus created; ice, plants, bones, peat, clay, are mixed in the most disorderly manner. It is hardly possible to imagine a more grotesque aspect. Here are seen pieces still covered with Lichens and Mosses, there a shoal of earth with bushes of Willows; at one place a lump of clay with Senecios and Polygonums, at another the remnants of the mammoth, tufts of hair, and some brown dust, which emits the smell peculiar to burial-places, and is evidently decomposed animal matter. The foot frequently stumbles over enormous osteological remains, some elephants' tusks measuring as much as twelve feet in length, and weighing more than 240 pounds. Nor is the formation confined to Eschscholtz Bay. It is observed in various parts of Kotzebue Sound, on the river Buckland, and in other localities, making it probable that a great portion of extreme North-western America is, underneath, a solid mass of ice. With such facts before us we must acknowledge that terrestrial heat exercises but a limited and indirect influence upon vegetable life, and that to the solar rays we are mainly indebted to the existence of those forms which clothe with verdure the surface of our planet.

The climate is considerably milder than that of the eastern shores of America. The proofs we need not deduce from artificial tables, Nature herself has written them on the face of the country. The abundance of animal life, the occurrence of many southern plants, and above all the limit of the woods, if compared with the opposite shores, furnish indisputable evidence. On the eastern side of America no forests are found above the mouth of the river Egg, above the 60th degree of latitude; on the western, they extend as far as latitude 66° 44′ north, or nearly seven degrees farther towards the Pole. There are but two seasons, both following each other in quick succession. Towards the middle of October the winter approaches. All life seems extinct. The sky is cloudless, the air calm, and most of the animals, the visitors of the mossy steppes during the few weeks of uninterrupted daylight, have left

for milder regions in order to obtain those supplies which the Polar world begins to deny them. Nearly nine months the waters are covered with ice, the land with snow; and the temperature is sometimes so low, falling as it does to forty-seven degrees Fahrenheit below zero, that rum and quicksilver become solid the instant they are exposed. The air is so pure that voices may be heard at a distance of two miles, and that even a whisper falls distinctly upon the ear. As the winter proceeds the days become shorter; in November they last but a few hours, in December the sun is hardly above the horizon, and in some latitudes never seen. Occasionally the darkness is dispelled by the appearance of the *aurora borealis*. From east to west an arch is forming, extending its brilliant coruscation up to the very zenith, and spreading a magic light over the wintry scene. Sometimes the rays are flashing up in straight lines, at others they move irregularly like a flame when affected by a breeze*. It is in the depth of winter that the grandeur of the Arctic region displays itself. A death-like silence is reigning far and wide; the stars, the moon, and a bleak expanse of snow and ice are the only objects visible. In vain does the wanderer listen; no chiming of bells, no barking of dogs, no crowing of cocks indicate the vicinity of civilization. His own breath, the solitary beating of his own heart, is all the ear perceives. It is in such moments, it is in the dreary steppes of the Polar region, that man feels he is made not to be alone, that there is something in his nature which longs for associations and prompts him to seek those circles where his exertion may be beneficial to his neighbours, and his wants be supplied by the aid of his fellow-creatures.

At last the sun returns; the days and the temperature increase. In the end of June the land is free from snow, and the ice breaking up. The summer sets in most rapidly. The landscape is quickly overspread with a lively green, flocks of geese and ducks arrive from the south, the plover, the snipe, and many other birds enliven the air with their notes, while the murmuring of rivulets and the hum of insects give evidence that winter has passed and summer fairly set in. The sun is now always above the horizon, and for some weeks there is no distinction between day and night, except that at midnight the light is less bright than at noon, the former differing from the latter about as much as a November and a June day in England. The rays falling continually upon the surface of the earth prevent the temperature from cooling down much, and thus, notwithstanding the low altitude of the sun, a degree of warmth is produced which, under other circumstances, would not be possible; the thermometer rising as high as sixty-one degrees Fahrenheit. With a sun shining throughout the twenty-four hours the growth of plants is rapid in the extreme. The snow has hardly disappeared before a mass of herbage has sprung up, and the same spots which a few days before presented nothing save a white sheet, are teeming with an active vegetation, producing leaves, flowers, fruit, in rapid succession.

* I observed that whenever the arch is above an angle of thirty degrees the coruscations are undisturbed by the lower atmospheric waves; whenever it assumes a higher altitude the rays are visibly affected by the action of the wind, moving in a uniform direction with it.

But it must not be supposed that during this time the sleep of plants is suspended. That function, though short, is as regular as in the tropics. With a midnight sun several degrees above the horizon, the leaves droop when evening approaches, partaking of that rest which seems to be necessary to the existence of both animal and vegetable life. If man should ever reach the Pole, and be undecided which way to turn,—when his compass has become sluggish, his timepiece out of order,—the plants which he may happen to meet will show him the way; their sleeping leaves tell him that midnight is at hand, and that at that time the sun is standing in the north. Human skill has long tried to construct instruments to aid those venturing to the Pole to find their way back. How curious if an all-wise Providence should have extended the range of a few Leguminous plants to the very axis of our planet, and made some humble herbs the means of furthering the solution of the greatest of geographical problems!

The whole country from Norton Sound to Point Barrow is a vast moorland, whose level is only interrupted by a few promontories and isolated mountains. The rain and snow-water, prevented by a frozen soil from descending, forms numerous lagoons, or, where the formation of the ground opposes this, bogs, the general aspect and vegetation of which do not materially differ from those of Northern Europe, being covered with a dense mass of Lichens, Mosses, and other uliginous forms. Places less crowded with plants are sometimes difficult to pass. The ground is soft, and covered with isolated tufts of *Eriophorum capitatum*. In walking over them some of the tufts give way, or the foot slides and sinks into the mud, from which it is often difficult to extricate it. Wherever drainage exists, either on the shores of the sea, the banks of rivers, or the slopes of hills, the ground is free from peat. Such localities are generally clad with a luxuriant herbage, and produce the rarest, as well as the most beautiful plants.

The aspect of some spots is very gay. Many flowers are large, their colours bright, and, though white and yellow predominate, plants displaying other tints are not uncommon. Cape Lisburne, one of the most productive localities, looks like a garden. The *Geum glaciale*, with its fine yellow blossoms, is intermingled with the purple *Claytonia sarmentosa*, and a host of Anemones and white and yellow Saxifrages, or the blue *Myosotis alpina*. But such spots are rare, they are like oases in deserts. The Flora cannot be said to possess an imposing aspect. There is nothing to relieve the monotony of the steppes. A few stunted Coniferous and Willow trees afford little variety, and even these, on passing the boundary of the Frigid zone, are either transformed into dwarf bushes, or disappear altogether. About Norton Sound groves of White Spruce-trees and *Salix speciosa* are frequent; northwards they become less abundant, till in latitude 66° 44′ 0″ north, on the banks of the Noatak, *Pinus alba* disappears. *Alnus viridis* extends as far as Kotzebue Sound, where, in company with *Salix villosa*, *S. Richardsoni*, and *S. speciosa*, it forms low brushwood. With the commencement of the Arctic circle *Alnus viridis* ceases to exist; *Salix speciosa*, *S. Richardsoni*, and *S. villosa* extend their range farther, but are only for a short distance able to keep their ground; at Cape Lisburne, in latitude 68° 52′ 6″ north, they are in the most favourable

localities never higher than two feet, while their crooked growth and numerous abortive leaf-buds indicate their struggle for existence. All attempts to spread their dominion towards the north prove unsuccessful; two degrees higher, and they are seen no more. At Wainwright Inlet a boundless plain presents itself. No tree interrupts the uniform line of the horizon, no shrub shows itself above the level of the turfy vegetation; all woody plants are prostrated to the ground, and only maintain life by seeking shelter among the mosses and lichens. The polar wind, which never affects the graceful palm, and is incapable of injuring the hardy oak, yet at last succeeds in laying low the offspring of Flora in these regions. Here they are doomed to slumber two-thirds of the year without sun, without warmth, in an icy bed, till the return of the great light restores the brightness of day and enables them to resume, for a few weeks, the busy operations of organized beings.

The region is as yet unchanged by human efforts. The Eskimaux, by their migratory habits, by spreading from Greenland to the Aleutian Islands, and by their annual journeys, as well as by their intercourse with the Tchukchis of Asia, may have contributed towards extending the range of certain species; but since cultivation of the soil is unknown, they can have exercised only a limited influence on the aspect of the Flora. Villages exist, yet all that our minds associate with them is wanting. On approaching we expect to meet with roads and bridges and smiling fields, to behold peaceful dwellings peeping through green boughs, and the steeple of the church towering heavenwards. In an Eskimaux village these pleasing features are looked for in vain. In the commencement of summer the habitations are deserted, the natives having left for the coast, in order to lay in a stock of whale and seal blubber. The underground dwellings look cheerless and are filled with water, the surrounding ground is scattered with bones and fragments of skin, broken sledges and other remnants; the paths are overgrown with herbage; the whole presenting a picture of misery and desolation. The Eskimaux have not yet learnt that migratory habits and progress in civilization are opposed to each other; they have not yet learnt to make the soil supply more than it is willing spontaneously to yield. The whole region is in a state of nature, and up to the year 1850 the only plants cultivated were a few turnips, which the commandant of a Russian trading post had sown near the fort of St. Michael. The natives care little for vegetable food, though they cannot entirely dispense with it. In the spring the leaves of the Sorrel (*Rumex domesticus*, Hartm.) are eagerly sought, in order to arrest the ravages of scurvy; and again towards autumn the roots of the Mashu (*Polygonum Bistorta*, Linn.). As a stock for the winter, raspberries, whortleberries, and cranberries are collected, placed in boxes, and preserved by being frozen into such a hard mass that in order to divide it recourse must be had to the axe, or some other sharp instrument. Nor do the Eskimaux make more use of vegetable substances for other purposes. Fuel they scarcely need, except for cooking. In their summer tents they require no fire, and their subterranean dwellings, on being heated, become uncomfortable, and begin to thaw and leak. The flames of a few lamps, the wicks of which are made of a moss (*Sphagnum fimbriatum*, Wils. et Hook.),

supply the necessary heat. Birches and Willows furnish materials for bows, Spruce-trees for arrows, while drift-wood affords means for constructing the skeleton of the *baidars*, or the walls of the hut. Man cannot be charged with having defaced the primeval aspect of this region; he has left everything as it was in the beginning. The mineral wealth rests undisturbed in the bowels of the earth; the vegetable kingdom still exercises an absolute sovereignty; and the animal creation swarms over the boundless steppes, rarely disturbed by the sight of the hunter, and uncontrolled by the voice of the herdsman.

It is not often that a Flora is so strictly original, and that its general character may be so accurately defined. Out of 242 Phanerogams, 2 are trees, 23 shrubs, 194 perennials, 7 biennials, and 12 annuals. Nature does not seem to have trusted to the region many plants whose propagation solely depends upon the ripening of their seeds; an uncertain harvest in a district where the quick approach of winter puts a sudden stop to vegetable operations. Nor are the physical circumstances favourable to the formation of wood. Most of the ligneous plants are mere *fruticuli*, very dwarfish, and more under the ground than above it. Only a few Willows, a Rose, the Red Currant, a Birch, and a *Spiræa* are deserving of the name of shrub. Trees are still more scarce, no more than two kinds (*Pinus alba* and *Salix speciosa*) having as yet been discovered. The White Spruce occasionally attains the height of forty or fifty feet, and a circumference of from four to five feet. The largest Willow (*S. speciosa*) seen was twenty feet high and nearly five inches in diameter. It had such a juvenile appearance that, judging from the growth of trees in milder climates, it would have been pronounced to be five or six years old; yet on closer examination its age proved more than eighty years. The leaves are alternate in 208 species, opposite or verticillate in 30, simple in 224, and compound in 15. Many flowers are large, 170 regular, and 69 irregular. The predominant colour of the floral envelopes is white in 83 species, greenish in 59, yellow in 43, purple in 24, blue in 17, rose-colour in 7, and red in 3. It is remarkable that red occurs only in three instances, and that scarlet is wanting. The predominance of white in plants approaching the Pole is analogous to the change of colour of many Arctic animals,—the ermine, the ptarmigan, the hare, and others, whose outer covering turns white in the beginning of winter. The fruit is dry in 33 species, and succulent in 9. Thus, speaking generally, it may be said that the plants of Western Eskimaux-land are perennial herbs, have alternate, simple leaves, regular white or yellow flowers, and a dry fruit. In all, 315 species have been discovered: 35 Thallogens, 38 Acrogens, 45 Endogens, and 197 Exogens; or 242 Phanerogams and 73 Cryptogams. The most numerous Orders are the Mosses and *Compositæ*, the former being represented by 30, the latter by 26 species. Then follows the family of the Lichens with 21 members, that of the Grasses with 20, *Saxifrageæ* with 19, *Rosaceæ* with 18, *Cruciferæ* with 17, and *Ranunculaceæ* and *Caryophylleæ* each with 15. The most extensive genera are *Saxifraga*, containing 18 species, *Potentilla* 9, *Salix*, *Ranunculus*, and *Polytrichum* 8, and *Pedicularis* and *Hypnum* 7; *Senecio* has but 6 representatives, and the rest still fewer.

The greater number of these plants are common to the Alps, the Rocky Mountains, and the northern portions of Europe and Asia; some even are inhabitants of the Antarctic countries*. Few are peculiar to Arctic America, and only three, *Artemisia androsacea*, Seem., *Eritrichium aretioides*, Alph. De Cand., and *Polytrichum cavifolium*, Wils., have exclusively been found in Western Eskimaux-land. Formerly a considerable number were thought to belong to the Polar regions of the north. In proportion, however, as knowledge increased, the endemic species have either been reduced to mere forms or varieties, or have proved to be plants common also to other countries. Now only a few remain, and there is reason to suppose that even these few will be found to extend their range over a much wider extent of surface than is at present assigned to them. The corroboration of this supposition would be productive of important results. It would throw additional light upon the geographical distribution of vegetable forms, and prove that the diffusion of plants had taken place, not from north to south, but from south to north,—a direction which, even in the absence of these data, may be supported by plausible arguments.

An essential difference exists between the Flora of the southern and the northern portions of Western Eskimaux-land, a few degrees in so high a latitude exercising a marked influence. In the southern or subarctic region there are still plants which the eye is accustomed to meet in the plains of more temperate climates, such as *Rosa blanda*, *Spiræa betulæfolia*, *Achillea Millefolium*, *Ribes rubrum*, *Corydalis pauciflora*, *Lupinus perennis*, *Sanguisorba Canadensis*, and *Galium boreale*; besides annuals and biennials, and shrubs and trees. However, in proceeding northward and having entered the Arctic circle, these forms disappear; the trees dwindle into low crooked bushes, and annuals and biennials cease almost entirely, the remaining plants being such as depend for their propagation rather on their buds than seeds. They are chiefly perennial herbs with cæspitose habit, such as *Geum glaciale*, *Artemisia borealis*, *A. glomerata*, *A. androsacea*, *Stellaria dicranoides*, *Dryas octopetala*, *D. integrifolia*, *Saxifraga cæspitosa*, and *Androsace Chamæjasme*. These, and Mosses, Lichens, Cotton-grasses, and low Willows, chiefly cover those endless steppes whose uniform aspect renders the Arctic region so dreary and monotonous.

A peculiar feature of the vegetation is its harmless character. The poisonous plants

* The following plants are found both in the Arctic and Antarctic, or, strictly speaking, Subantarctic, countries, viz., *Anemone decapetala*, Linn., *Cardamine hirsuta*, Linn., *Draba incana*, Linn., *Stellaria media*, Vill., *Cerastium arvense*, Linn., *C. vulgatum*, Linn., *Arenaria media*, Linn., *Montia fontana*, Linn., *Lathyrus maritimus*, Linn., *Potentilla anserina*, Linn., *Hippuris vulgaris*, Linn., *Callitriche verna*, Linn., *Galium Aparine*, Linn., *Erigeron alpinum*, Linn., *Taraxacum Dens-leonis*, Desf., *Gentiana prostrata*, Hænk., *Limosella aquatica*, Linn., *Statice Armeria*, Linn., *Chenopodium glaucum*, Linn., *Elæocharis palustris*, Brown, *Carex ovalis*, Good., *C. festiva*, Dewey, *C. curta*, Good., *Alopecurus alpina*, Smith, *Phleum alpinum*, Linn., *Agrostis alba*, Linn., *A. tenuifolia*, Bieb., *Aira flexuosa*, Linn., *A. caryophyllea*, Linn., *Poa nemoralis*, Linn., *P. pratensis*, Linn., *Festuca duriuscula*, Linn., *Triticum repens*, Linn., and *Trisetum subspicatum*, Beauv.—The number of Cryptogamic plants, especially Mosses, Lichens, and Algæ, common to both countries, is very much greater. Compare Hooker's 'Flora Antarctica.'

are few in number, and their qualities are by no means very virulent. The traveller need not fear to get blinded or giddy by entering a thicket; no members of those families to which the Manzanillo, the Upas-tree, or the Nightshade belong, inhabit the extreme north. He need not be afraid to be hit by an arrow dipped in the sap of the deadly Wourali,—no *Loganiacea* extends its range to these latitudes,—nor be much on his guard against spines and thorns. Save the *Geum glaciale*, and a Rose—which forms no exception to the rule incorporated in a popular adage,—there are no plants bearing arms, belonging to that group which has been termed the "milites." The Fauna presents an analogy. Reptiles do not venture into the Subarctic and Arctic regions. Physical circumstances seem to have exercised upon that tribe the same check as, according to tradition, the presence of St. Patrick has done in one of the British islands. Some of the quadrupeds are ferocious, but not to the same degree as in the tropics. How the bear may be trained we have frequently an opportunity of seeing, and how easily the reindeer may be domesticated is well known. Even the wolf,—the dismal howling of which seems to be a fit concert in the wilderness of the north,—becomes under the care of man a useful animal. The Eskimaux dog is to all appearances the result of such treatment*. From being the enemy, the wolf becomes the friend of man, and is dragging the sledge of the very master whom herds of his wild relatives are ready to attack and devour.

When considering the Flora in a commercial point of view, we find, as far as our present knowledge enables us to see, no productions which would play a prominent part in the traffic of civilized nations. Of wood there is only a limited quantity, and that is too far inland; the leaves of the *Rumex domesticus* and the different Scurvy-grasses, as well as the roots of some Polygonums, may, in the absence of better vegetables, serve for culinary purposes, and they may even, under cultivation, become more palatable; the various kinds of berries may be highly useful to the Eskimaux, destitute as they are of any other fruit, and they may be most welcome antiscorbutics to those voyagers whose daring leads them to the Polar Seas; the Iceland Moss and other lichens may be useful tonics and dyes; but all these productions are of little or no commercial importance. Should the country be ever inhabited by a civilized people, they will have to look to the animal creation for those means which procure the commodities of more favoured climes, and they will have to exchange walrus-tusks, eider-down, furs, and train oil, for the spices of India, the manufactures of Europe, and the medicinal drugs of tropical America.

* "The wolf is often caught by the Eskimaux for the purpose of crossing their dogs, and thus adding to their size and strength. . . . . The resemblance between the wolf and the Eskimaux dog is indeed striking. Both have the same low, melancholy howl, and although the dog has the head and ears shorter, the eyes smaller and more sunk, the tail handsomely curled over the back, the paws smaller and less spread, and the colour of every hue, yet these distinctions are not of sufficient importance to raise it to the rank of a separate species."—*Bedford Pim's Western Relief Expedition, MSS.*

SYNOPSIS.

RANUNCULACEÆ.

1. Anemone *alpina*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 5.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 11. Kotzebue Sound.

2. Anemone *parviflora*, Michx., Hook. Fl. Bor. Amer. vol. i. p. 5.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 12. Kotzebue Sound.

3. Anemone *Richardsoni*, Hook., Fl. Bor. vol. i. p. 6.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 13. Kotzebue Sound, swampy ground; near springs.

4. Anemone *multifida*, De Cand., Prodr. vol. i. p. 21.—Hook. Fl. Bor. Amer. vol. i. p. 7.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 13.—*A. narcissiflora*, Hook. et Arn. Bot. Beech. p. 121! From Kotzebue Sound to Cape Lisburne; between Point Barrow and Mackenzie river (*Pullen*).

The specimen of this *Anemone* contained in Beechey's Collection, was mistaken for *A. narcissiflora* of Linnæus, but as a comparison with more perfect materials has shown, it is only an imperfect state of *A. multifida*. All these specimens collected by me have white flowers.

5. Ranunculus *Pallasii*, Schlecht., Animadv. Bot. vol. i. p. 15. t. 2.—Hook. Fl. Bor. Amer. vol. i. p. 10.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 17. Kotzebue Sound.

This *Ranunculus* appears to be one of the few plants peculiar to the Arctic and Subarctic regions. It has been found in Siberia in the country of the Samoiedes, in the island of St. George, and in Kotzebue Sound. The leaves are either linear and entire or obovate-triparted, and they exhibit, besides, the intermediate forms. The number of sepals varies from three to four, that of the petals, from eight to ten. The colour of the flowers is constant, the petals being white with a reddish hue at the base, not yellow, as Torrey and Gray have described them. *R. Pallasii* must, on that account, be placed near *R. glacialis*, and not with *R. auricomus* and its allies.

6. Ranunculus *affinis*, R. Brown, Hook. Fl. Bor. Amer. vol. i. p. 12. t. 6. A.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 18. Kotzebue Sound.

7. Ranunculus *Purshii*, Richards., Hook. Flor. Bor. Amer., vol. i. p. 15. t. 7. B.—Torr. et Gray, Flor. of N. Amer. vol. i. p. 19.—*R. multifidus*, Pursh, Fl. Amer. vol. ii. p. 736. Kotzebue Sound.

8. Ranunculus *Lapponicus*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 16.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 20. Kotzebue Sound.

9. Ranunculus *hyperboreus*, Rottb., Hook. Fl. Bor. Amer. vol. i. p. 16.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 20. From Norton Sound to Wainwright Inlet.

10. Ranunculus *pygmæus*, Wahl, Hook. Fl. Bor. Amer. vol. i. p. 16.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 20. Kotzebue Sound.

11. Ranunculus *nivalis*, R. Brown, Hook. Fl. Bor. Amer. vol. i. p. 17.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 20. Kotzebue Sound; it has also been found by Captain W. Penny in Assistance Bay.

12. Ranunculus *Eschscholtzii*, Schlecht., Animadv. vol. ii. p. 16. t. 1.—Hook. Fl. Bor. Amer. vol. i. p. 18.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 21. From Kotzebue Sound to Cape Lisburne.

13. Delphinium *Menziesii*, De Cand., Prodr. vol. i. p. 54.—Hook. Fl. Bor. Amer. vol. i. p. 25.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 31. From Kotzebue Sound to Cape Lisburne.

14. Aconitum *Napellus*, Linn., *β delphiniifolium*, Ser., Hook. Fl. Bor. Amer. vol. i. p. 26.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 34. Chamisso Island; Norton Sound; between Point Barrow and Mackenzie River (*Pullen*).

15. Thalictrum *alpinum*, Linn., Torr. et Gray, Fl. of N. Amer. vol. i. p. 39. Port Clarence.

PAPAVERACEÆ.

16. Papaver *nudicaule*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 34.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 60. Common throughout Western Eskimaux-land. It has also been found between Point Barrow and Mackenzie River (*Pullen*), in Buchan and Cornwallis Islands (*Ede*), and in Assistance Bay (*Penny*).

P. nudicaule alters the colour of its petals, of which apparently temperature is the cause. In Kotzebue Sound and other subarctic parts the petals are yellow; towards Point Barrow, and in exposed positions, almost invariably white. In another *Papaveracea* I noticed a similar change. *Argemone Mexicana*, Linn., is, around Lima and the temperate districts of Ecuador, white; in the torrid regions of New Granada, Central America, Mexico, and Africa, yellow; while, at the Hawaiian Islands, which enjoy a cool climate, the colour is again changed into white.

FUMARIACEÆ.

17. Corydalis *pauciflora*, Pers., Hook. Fl. Bor. Amer. vol. i. p. 37.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 70. Island of St. Lawrence.

The island of St. Lawrence seems to be the most northern limit which this species attains; the specimens contained in Herbaria have exclusively been gathered there and in Siberia, none on the mainland of America. The *Corydalis pauciflora* appears, therefore, to have its focus in Asia rather than in America.

CRUCIFERÆ.

18. Cardamine *purpurea*, Cham. and Schlecht., Hook. Fl. Bor. Amer. vol. i. p. 44.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 84. Wainwright Inlet.

19. Cardamine *pratensis*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 45.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 84. Kotzebue Sound; between Point Barrow and Mackenzie River (*Pullen*).

20. Cardamine *digitata*, Richards., Hook. Fl. Bor. Amer. vol. i. p. 45.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 86. Wainwright's Inlet; between Point Barrow and Mackenzie River (*Pullen*).

All the specimens collected in Western Eskimaux-land have white flowers.

21. Parrya *macrocarpa*, R. Brown, var. *aspera*, Hook., Fl. Bor. Amer. vol. i. p. 47.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 88. Cape Lisburne; between Point Barrow and Mackenzie River (*Pullen*).

The flowers of my specimens are purple, and, when gathered, they exhaled a slight odour.

22. Hesperis *Pallasii*, Torr. et Gray, Fl. of N. Amer. vol. i. p. 667.—*H. minima*, Torr. et Gray, l. c. p. 90.—*H. pygmæa*, Hook., Fl. Bor. Amer. vol. i. p. 60. t. 19.—*Cheiranthus? Pallasii*, Pursh, Fl. Amer. vol. ii. p. 436.—*Ch. pygmæus*, Adams, De Cand. Prodr. vol. i. p. 137. Kotzebue Sound, in gravelly soil.

Not an annual, but a biennial plant.

23. Sisymbrium *sophioides*, Fish., Hook. Fl. Bor. Amer. vol. i. p. 92. Kotzebue Sound, plentiful on the ice-cliffs in Eschscholtz Bay, growing in company with *Senecio palustris* and *Polygonum alpinum*. Between Point Barrow and Mackenzie River (*Pullen*).

24. Draba *alpina*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 50.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 102. Kotzebue Sound; Assistance Bay (*Penny*).

25. Draba *glacialis*, Adams, Hook. Fl. Bor. Amer. vol. i. p. 51.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 104. Cape Lisburne; Assistance Bay (*Penny*); Garry Isle (*Pullen*).

26. Draba *muricella*, Wahl, Hook. Fl. Bor. Amer. vol. i. p. 52.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 104. Wainwright Inlet; Buchan Isle (*Ede*).

27. Draba *hirta*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 52.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 105. Kotzebue Sound.

28. Draba *stellata*, Jacq., Hook. Fl. Bor. Amer. vol. i. p. 53.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 105. Kotzebue Sound.

29. Draba *incana*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 54.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 107. St. Lawrence Island; Garry Island (*Pullen*).

30. Cochlearia *oblongifolia*, De Cand., Hook. Fl. Bor. Amer. vol. i. p. 56.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 109. Wainwright Inlet; Herald Island; between Point Barrow and Mackenzie River (*Pullen*); Wellington Channel (*Ede*).

31. Cochlearia *Anglica*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 57.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 109. Kotzebue Sound; Assistance Bay (*Penny*).

32. Cochlearia *fenestrata*, R. Brown, Hook. Fl. Bor. Amer. vol. i. p. 57.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 109. From Norton Sound to Point Barrow; Assistance Bay (*Penny*).

33. Tetrapoma *pyriforme*, Seem. (Plate II.)—*T. barbaræfolium*, Turcz. in Linnæa, vol. x. Literat. 104.—*T. barbaræfolium*, Turcz., var. Spach.—*T. Crusianum*, Turcz. l. c.—*Camelina barbaræfolia*,

De Cand., Prodr. vol. i. p. 201.—Deless. Icon. Sel. vol. ii. t. 70.—*Tetracellion ellipsoideum,* Turcz. Fort of St. Michael, Norton Sound, in alluvial soil; apparently introduced by the Russians from Siberia.

No one comparing the figure in Delessert's 'Icones Selectæ,' with that given on Plate II. of this work, would fancy that the two were intended for the same plant. In Delessert's figure the siliculæ are nearly globose, in mine they are pyriform. The difference arises from the blunder committed by the artist of the 'Icones Selectæ,' who has represented an immature fruit magnified, for a full-grown one. The fruit, from being almost globose, becomes, in advancing, stretched at the base, until, when ripe, it has assumed the shape of a pear. Turczaninow enumerates two species of *Tetrapoma*, distinguishing them principally by the length of the style. I find that no importance can be attached to that character. In one and the same specimen, as Dr. Planchon has well remarked in Herb. Hook., the stigma is either sessile or placed upon a style of more or less length, and as no other difference can be detected between *T. barbaræfolium* and *T. Crusianum*, I have united the two species, under the name *T. pyriforme*. The size of the plant is extremely variable. Some of the specimens before me measure only a few inches; others, gathered in Norton Sound, are from two to three feet high. The leaves also are subject to great variation. They are entire, lyrate, or deeply pinnatifid, and, like the whole plant, more or less covered with hair. The valves of the siliculæ are generally four in number, and the genus *Tetrapoma* has on that account been looked upon as the normal type of the Order *Cruciferæ*. That number, however, is not constant. I observed some fruits with two, some with three, and even some with five and six valves. The native country of the plant I believe to be Northern Asia. It has been found between Aldan and Ochotsk (*Turczaninow*), at Isinga, at Koragisk, and by me in Norton Sound, where I have reason to believe it has been brought by the Russians, but where it is now perfectly wild.

Plate II. Fig. 1, flower; 2, sepal; 3, petal; 4, stamen; 5, 6, ovary; 7, ovary cut horizontally; 8, ripe fruit; 9, fruit with one of the valves removed; 10, valve; 11, fruit cut horizontally; 12, seed; 13, seed cut horizontally; 14, embryo:—*all magnified.*

34. Hutchinsia *calycina,* Desv., var. *integrifolia,* Hook., Fl. Bor. Amer. vol. i. p. 59.—Torr. et Gray, Flor. of N. Amer. vol. i. p. 114. Cape Kruzenstern.

HYPERICINEÆ.

35. Parnassia *palustris,* Linn., Hook. Fl. Bor. Amer. vol. i. p. 82.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 148. Kotzebue Sound and Port Clarence; from Point Barrow to Bear Lake River (*Pullen*).

36. Parnassia *Kotzebuei,* Cham. et Schlecht., Hook. Fl. Bor. Amer. vol. i. p. 83. t. 28.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 149. From Port Clarence to Cape Lisburne.

On examining *P. Kotzebuei* I found that nearly one-half of the specimens collected in Western Eskimaux-land had five stigmas and a capsule with five valves; and in analyzing *P. palustris* from that country the same result was obtained. It remains, therefore, to be seen whether the same formation exists in other species, and whether *P. palustris* from other localities may not have five valves. Torrey and Gray, in speaking of *P. Kotzebuei*, remark, that the figure in Hooker's 'Flora Boreali-Americana' exhibits views of pentacarpellary capsules, and conclude that they represent monstrosities. But if, with Don and Lindley, we look upon the genus *Parnassia* as a true member of the order *Hypericineæ*, we cannot be surprised to find a quinary arrangement of the fructification, and must rather be inclined to consider it as the normal formation than as a monstrosity.

CARYOPHYLLEÆ.

37. Merckia *physodes*, Fisch., Hook. Fl. Bor. Amer. vol. i. p. 103.—*Arenaria physodes*, De Cand., Prodr. vol. i. p. 403.—*Stellaria ovalifolia*, Hook. Fl. Bor. Amer. vol. i. p. 97; Hook et Arn. Bot. Beech. p. 122.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 176. From Norton Sound to Point Barrow.

38. Honckenya *peploides*, Ehr., Hook. Fl. Bor. Amer. vol. i. p. 176 (*ex parte*).—Torr. et Gray, Fl. of N. Amer. vol. i. p. 176.—*Arenaria peploides*, Linn., De Cand. Prodr. vol. i. p. 413. Common on the shores of the Arctic Sea.

39. Arenaria *hirta*, Wormsk., Hook. Fl. Bor. Amer. vol. i. p. 99.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 181. Common throughout Western Eskimaux-land.

40. Arenaria *arctica*, Steven., Hook. Fl. Bor. Amer. vol. i. p. 100.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 181. From Kotzebue Sound to Cape Lisburne.

41. Stellaria *humifusa*, Rottb., Hook. Fl. Bor. Amer. vol. i. p. 97.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 184. Kotzebue Sound.

42. Stellaria *longipes*, Goldie, Hook. Fl. Bor. Amer. vol. i. p. 95.—Torr. et Gray, Fl. of N. Amer. p. 184. Kotzebue Sound; between Point Barrow and Mackenzie River, Richard's Isle (*Pullen*); Cornwallis Island (*Ede*); Northumberland Inlet and Assistance Bay (*Penny*).

Several forms of this species are in the collection.

43. Stellaria *longifolia*, Muhl., Hook. Fl. Bor. Amer. vol. i. p. 94.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 185. Kotzebue Sound; between Fort Simpson and Great Slave Lake (*Pullen*).

44. Stellaria (§ Adenoma) *dicranoides*, Fenzl (Plate III.); glaberrima pulvinatim cæspitans, caudiculis clavatis imbricato-foliosissimis, cauliculis nullis, foliis subspathulato-oblongis sive lanceolatis basi attenuata vaginantibus subcarinatis subenerviis carnosulis adpressis emortuis diaphanis persistentibus, floribus solitariis, calycis laciniis oblongo-lanceolatis petala semibifida $\frac{1}{3}$–$\frac{1}{2}$ superantibus. ♃.—*S. dicranoides*, Fenzl in Ledeb. Fl. Ross. vol. i. p. 395.—*Cherleria dicranoides*, Cham. et Schlecht. in Linnæa, vol. i. p. 63. Cape Lisburne.

Notwithstanding that all the specimens collected by me are without petals, I have no hesitation to refer them to Fenzl's *S. dicranoides:* the corolla may have dropped off, as the season was far advanced when the plants were gathered, or, as is the case with other *Alsineæ*, it may be present at one time and abortive at another. This species has previously been found in the Bay of St. Lawrence. Cape Lisburne, where I gathered it, both in 1849 and 1850, is the only locality on the American continent as yet recorded.

Plate III. Fig. 1, a piece of the stem and two leaves; 2, a leaf; 3, leaves and the calyx; 4, gland, stamens, ovary, and styles; 5, a portion of the gland, and three stamens; 6, ovary and styles; 7, seed:—*all magnified.*

45. Cerastium *viscosum*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 103.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 187. Norton Sound.

46. Cerastium *alpinum*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 104.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 188. Kotzebue Sound; also found in Assistance Bay, Buchan Island (*Penny*); Joateri (*Ede*).

C. alpinum, var. *Fischerianum*, Torr. et Gray, Fl. of N. Amer. vol. i. p. 188.—*C. Fischerianum*, Ser., Hook. Fl. Bor. Amer. vol. i. p. 188. Kotzebue Sound; Arctic coast (*Pullen*).

47. Cerastium *Behringianum*, Cham. et Schlecht., Hook. Fl. Bor. Amer. vol. i. p. 105.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 188. From Kotzebue Sound to Cape Lisburne.

48. Silene *acaulis*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 87.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 189. Cape Lisburne; also found between Point Barrow and Mackenzie River (*Pullen*); Woman's Island (*Ede*).

49. Lychnis *apetala*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 91.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 194. Very common throughout Western Eskimaux-land; also gathered between Point Barrow and Mackenzie River (*Pullen*); in Assistance Bay (*Penny*); Wolstenkolme (*Ede*).

Usually found in sand or clay, where it bears white flowers. When growing in peaty soil it is less robust, the leaves are narrower, and the veins of the calyx and the petals purple.

50. Dianthus *repens*, Willd. (Plate IV.); caulibus numerosis ipsa basi divisis in ramos simplicissimos adscendentes unifloris, foliis linearibus acutis glaberrimis glaucis, squamis calycinis binis ovato-lanceolatis longissime acuminatis apice petalis calyce ventricoso sublongioribus, petalorum lamina obovata apice crenato-dentata calycis longitudine. ♃.—Ledeb. Fl. Ross. vol. i. p. 281.—Willd. Herb. no. 8544.—Hook. Fl. Bor. Amer. vol. i. p. 87.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 195. Between Kotzebue Sound and Cape Lisburne.

A beautiful plant, covering the slopes of hills and presenting a dense mass of purple flowers. It has been found, according to Ledebour, in Eastern Siberia between Irkutsk and Ochotsk; in Western Eskimaux-land it ranges between Kotzebue Sound and Cape Lisburne; the latter locality is the most northern as yet ascertained.

Plate IV. Fig. 1, petal; 2, stamen; 3, ovary and stigma:—*all magnified.*

PORTULACEÆ.

51. Claytonia *Virginica*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 224.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 198. Kotzebue Sound (*Collie*).

52. Claytonia *sarmentosa*, C. A. Meyer (Plate V.); radice fusiformi-filiformi, caudice primum brevissimo turbinato demum elongato cylindrico densissime cicatrizato apice incrassato sarmentoso, sarmentis tenuissime filiformibus, scapis erectis vel diffusis, foliis subnervosis, radicalibus oblongis subspathulatis vel ellipticis in petiolum basi vix vel subdilatatum attenuatis, caulinis ovatis vel subcordatis basi haud connatis, racemo solitario unibracteato, floribus solitariis, calyce obtusissimo pedicello 4–6-plo breviore, petalis late obovatis emarginatis vel retusis calyce 3–4-plo longioribus albis vel roseis. ♃.—*C. sarmentosa*, C. A. Mey. in Mem. de la Soc. des Nat. de Mosc. vol. vii. p. 137, t. 3.—Ledeb. Fl. Ross. vol. ii. p. 149.—*C. lanceolata*, Hook. et Arn., Bot. Beech. p. 123 (nec Pursh, fide spec. in Herb. Hook.!—*C. Virginiana*, Hook. et Arn., Bot. Beech l. c.?? Cape Lisburne.

My specimens belong rather to var. α, *latifolia*, Ledeb., than β, *tenella*, Ledeb., and they all have rose-coloured flowers. The *C. lanceolata*, Hook. et Arn., is identical with *C. sarmentosa*, and it is not unlikely that *C. Virginica* of 'Beechey's Botany' may also be a mere form of *C. sarmentosa*. I have not seen any species of *Claytonia* in Western Eskimaux-land save the latter, and the remark of Hooker and Arnott, that the leaves of their specimens were remarkably broad, and sheathing at the base, seems to show that they

might have had some state of *C. sarmentosa*. Beechey's specimens, on which *C. Virginica* has been founded, are not contained in Sir William Hooker's Herbarium; they were probably thrown away; the plants collected during the Blossom's voyage being mostly so imperfect and so badly preserved, that few of them were worth keeping, and that nothing, save the utmost diligence and perseverance, could have turned them to any use whatever.—*C. sarmentosa* grows at Cape Lisburne, where both Captain Beechey's officers and myself found it. Chamisso gathered it in the islands of St. George and St. Lawrence.

PLATE V. Fig. 1, petal; 2, stamen; 3, ovary and style; 4, ovary cut open; 5, fruit:—*all magnified*.

53. MONTIA *fontana*, Linn., Torr. et Gray, Fl. of N. Amer. vol. i. p. 202. St. Michael, Norton Sound, being the most northern American station recorded.

PAPILIONACEÆ.

54. LATHYRUS *maritimus*, Bigel, Torr. et Gray, Fl. of N. Amer. vol. i. p. 273.—*L. pisiformis*, Hook., Fl. Bor. Amer. vol. i. p. 158. Common on the shores of Western Eskimaux-land, from the southern extremity of Behring's Strait to Point Barrow.

55. LATHYRUS *palustris*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 161.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 275. On the banks of the river Buckland; rare.

56. OXYTROPIS *borealis*, De Cand., Prodr. vol. ii. p. 275.—Hook. Fl. Bor. Amer. vol. i. p. 145. —Torr. et Gray, Fl. of N. Amer. vol. i. p. 338. Cape Kruzenstern.

57. OXYTROPIS *arctica*, R. Brown, Hook. Fl. Bor. Amer. vol. i. p. 146.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 338. Cape Lisburne; Arctic coast west of Cape Bathurst (*Pullen*).

58. OXYTROPIS *campestris*, De Cand., Prodr. vol. ii. p. 278.—Hook. Fl. Bor. Amer. vol. i. p. 147. —Torr. et Gray, Fl. of N. Amer. vol. i. p. 340.—Cape Lisburne; between Point Barrow and Mackenzie River (*Pullen*).

59. PHACA *frigida*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 140.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 344. Cape Lisburne.

60. PHACA *astragalina*, De Cand., Prodr. vol. ii. p. 247.—Hook. Fl. Bor. Amer. vol. i. p. 145.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 345. From Kotzebue Sound to Point Barrow; between Point Barrow and Bear Lake River, and in Pelly's Isle (*Pullen*).

61. HEDYSARUM *boreale*, Nutt., Fl. Bor. Amer. vol. i. p. 155.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 356. Cape Lisburne; from Fort Simpson to Great Bear Lake (*Pullen*).

62. LUPINUS *perennis*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 163.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 376. Banks of the river Buckland; between Fort Good Hope and Point Separation (*Pullen*).

ROSACEÆ.

63. SPIRÆA *betulæfolia*, Pallas, Hook. Fl. Bor. Amer. vol. i. p. 172.—Torr. et. Gray, Fl. of N. Amer. vol. i. p. 414. Kotzebue Sound; which is apparently its northern limit on the western coast of America.

64. Dryas *octopetala,* Linn., Hook. Fl. Bor. Amer. vol. i. p. 174.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 420. From Port Clarence to Cape Lisburne.

65. Dryas *integrifolia,* Vahl, Hook. Fl. Bor. Amer. vol. i. p. 174.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 420. Port Clarence; between Point Barrow and Mackenzie River (*Pullen*); Assistance Bay, Berry Isle, and adjacent islands (*Penny*).

The leaves of this species are always smooth on the upper surface, never rugose, as those of *D. octopetala;* this character seems to be the best mark of distinction between the two species, all the others assigned to them are subject to variation.

66. Geum *glaciale,* Adams, Torr. et Gray, Fl. of N. Amer. vol. i. p. 423.—*Sieversia glacialis,* R. Brown, Hook. Fl. Bor. Amer. vol. i. p. 176. Cape Lisburne.

67. Sanguisorba *Canadensis,* Linn., Torr. et Gray, Fl. of N. Amer. vol. i. p. 429.—*S. media,* Auct. Banks of the river Buckland.

68. Potentilla *sericea,* Linn., var. *glabrata,* Lehm., Hook. Fl. Bor. Amer. vol. i. p. 189.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 437.—*P. Pennsylvanica,* Hook. et Arn. Bot. Beech. p. 123; sec. Lehm. in Herb. Hook. Kotzebue Sound.

69. Potentilla *pulchella,* R. Brown, Hook. Fl. Bor. Amer. vol. i. p. 191.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 439. Cape Lisburne.

70. Potentilla *nana,* Lehm., Hook. Fl. Bor. Amer. vol. i. p. 194.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 441. Kotzebue Sound; Berry Island (*Penny*).

71. Potentilla *emarginata,* Pursh, Hook. Fl. Bor. Amer. vol. i. p. 194.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 446.—Lehm. Nov. et minus cognit. Stirp. pug. vol. ix. p. 66. Kotzebue Sound; between Point Barrow and Mackenzie River (*Pullen*); Wolstenkolme (*Ede*).

72. Potentilla *nivea,* Linn., var. *Vahliana,* Seem.—*P. Vahliana,* Lehm., Hook. Fl. Bor. Amer. vol. i. p. 194.—*P. nivea,* var. γ, Torr. et Gray, Fl. of N. Amer. vol. i. p. 441. Kotzebue Sound; coast west of Cape Bathurst (*Pullen*).

73. Potentilla *villosa,* Pall., Hook. Fl. Bor. Amer. vol. i. p. 194.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 442. Kotzebue Sound.

74. Potentilla *biflora,* Lehm., Hook. Fl. Bor. Amer. vol. i. p. 195.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 442. Cape Lisburne; Kotzebue Sound.

75. Potentilla *anserina,* Linn., Hook. Fl. Bor. Amer. vol. i. p. 189.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 444. Kotzebue Sound; from Point Barrow to Bear Lake River (*Pullen*).

76. Potentilla *fruticosa,* Linn., Hook. Fl. Bor. Amer. vol. i. p. 186.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 445. Banks of the river Buckland; between Fort Good Hope and Point Separation (*Pullen*).

77. Comarum *palustre,* Linn., Torr. et Gray, Fl. of N. Amer. vol. i. p. 447.—*Potentilla palustris,* Scop., Hook. Fl. Bor. Amer. vol. i. p. 187. Kotzebue Sound.

78. Rubus *Chamæmorus,* Linn., Hook. Fl. Bor. Amer. vol. i. p. 183.—Torr. et Gray, Fl. of N.

Amer. vol. i. p. 451. Common from Norton Sound to Point Barrow; between Point Barrow and Mackenzie river (*Pullen*).

The Eskimaux gather large quantities of this raspberry, and preserve it for winter stock.

79. Rubus *arcticus*, Linn., Torr. et Gray, Fl. of N. Amer. vol. i. p. 451.—*R. arcticus*, Linn., et *R. acaulis*, Michx., Hook. Fl. Bor. Amer. vol. i. p. 182. Kotzebue Sound; between Fort Simpson and Great Slave Lake (*Pullen*).

80. Rosa *blanda*, Ait., Hook. Fl. Bor. Amer. vol. i. p. 199.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 459. Banks of the river Buckland, being the most northern station on the west coast as yet known; between Fort Simpson and Bear Lake River (*Pullen*).

ONAGRARIÆ.

81. Epilobium *angustifolium*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 205.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 487. Common throughout Western Eskimaux-land; from Point Barrow to Bear Lake River (*Pullen*).

82. Epilobium *latifolium*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 205.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 487. From Norton Sound to Point Barrow; between Fort Simpson and Bear Lake River (*Pullen*); Northumberland Inlet (*Penny*).

HALORAGEÆ.

83. Hippuris *maritima*, Hellen., Hook. Fl. Bor. Amer. vol. i. p. 218.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 531. Deltas of the river Buckland.

GROSSULACEÆ.

84. Ribes *rubrum*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 232.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 550. Banks of the river Buckland.

CRASSULACEÆ.

85. Sedum *Rhodiola*, De Cand., Hook. Fl. Bor. Amer. vol. i. p. 227.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 558. Port Clarence; Kotzebue Sound.

SAXIFRAGACEÆ.

86. Saxifraga *oppositifolia*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 242.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 563. Cape Lisburne; Kotzebue Sound; between Point Barrow and Mackenzie river (*Pullen*); Assistance Bay and Berry Island (*Penny*); Kakdidlarn, Greenland, and Cornwallis Island (*Ede*).

87. Saxifraga *Eschscholtzii*, Sternb., Hook. Fl. Bor. Amer. vol. i. p. 242.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 563. Cape Lisburne; Kotzebue Sound.

88. Saxifraga *Hirculus*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 252.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 564. From Norton Sound to Point Barrow; between Point Barrow and Mackenzie river (*Pullen*); Northumberland Inlet (*Penny*).

89. Saxifraga *flagellaris*, Willd., Hook. Fl. Bor. Amer. vol. i. p. 253. t. 87.—Bot. Mag. tab. 4621.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 564. Cape Lisburne; Kotzebue Sound; Assistance Bay (*Penny*).

Varies in the number of flowers and in the colour of the petals. Some specimens (Bot. Mag. t. 4621) are uniform yellow; others, and all those found on the western coast, have, like *S. Hirculus*, red dots upon the corolla.

90. Saxifraga *bronchialis*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 254.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 564. Wainwright Inlet.

91. Saxifraga *tricuspidata*, Retz., Hook. Fl. Bor. Amer. vol. i. p. 254.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 564. Choris Peninsula, Kotzebue Sound; Northumberland Inlet (*Penny*).

92. Saxifraga *cæspitosa*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 244.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 565. Kotzebue Sound; Wolstenkolme, Greenland, and Cornwallis Island (*Ede*).

93. Saxifraga *sileniflora*, Sternb., Hook. Fl. Bor. Amer. vol. i. p. 245.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 566. Kotzebue Sound.

94. Saxifraga *serpyllifolia*, Pursh, Hook. Fl. Bor. Amer. vol. i. p. 243.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 566. Cape Lisburne.

95. Saxifraga *æstivalis*, Fisch, Hook. Fl. Bor. Amer. vol. i. p. 251.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 567. Kotzebue Sound.

96. Saxifraga *Davurica*, Willd., Hook. Fl. Bor. Amer. vol. i. p. 250.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 569.—*S. flabellifolia*, R. Brown, in Torr. et Gray, l. c.?? Cape Lisburne.

S. flabellifolia, R. Brown, does not seem to be distinct from *S. Davurica*. The scapes of the true *S. Davurica* have also occasionally a leaf nearly similar to the radical ones; and all the other characters assigned to *S. flabellifolia* are equally applicable to *S. Davurica*..

97. Saxifraga *foliolosa*, R. Brown, Hook. Fl. Bor. Amer. vol. i. p. 251.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 570. Cape Lisburne.

98. Saxifraga *nivalis*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 248.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 571. Cape Lisburne; Nicholson's Isle (*Pullen*); Cornwallis Island (*Ede*); Assistance Bay (*Penny*).

99. Saxifraga *hieraciifolia*, Waldst. et Kit., Hook. Fl. Bor. Amer. vol. i. p. 249.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 572. Kotzebue Sound.

100. Saxifraga *cernua*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 245.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 573. Kotzebue Sound; between Point Barrow and Mackenzie River (*Pullen*); Northumberland Inlet (*Penny*); Ukaari and Cornwallis Island (*Ede*).

101. Saxifraga *Sibirica*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 246.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 573. Kotzebue Sound.

102. Saxifraga *rivularis*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 246.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 574. Herald Island; Whale Fish Island (*Ede*).

103. Saxifraga *Richardsonii*, Hook., Fl. Bor. Amer. vol. i. p. 247.—*S. Nelsoniana*, Hook. et Arn., Bot. Beech. p. 124. t. 129.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 575. Cape Lisburne.

A highly ornamental herb, and worthy a place in a flower-garden. It grows in damp places, in clay or gravelly soil, and is from a foot to two feet in height. The ovary, the stamen, and the base of the petals are purple; the apex of the petals is either rose or flesh-coloured, with veins of a deeper tint. The flowers only become white when fading.

104. Chrysosplenium *alternifolium*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 241.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 589. From Kotzebue Sound to Cape Lisburne.

UMBELLIFERÆ.

105. Bupleurum *ranunculoides*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 263.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 609. From Port Clarence to Cape Lisburne.

The specimens collected at Cape Lisburne, the highest northern station of this species recorded, are much crippled, no more than three inches in height, and have a simple stem; while those obtained at Port Clarence, some degrees farther south, are from six to eight inches high, and much branched. The leaflets of the involucre are generally more than five, but they never exceed ten in number.

106. Ligusticum *Scoticum*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 265.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 618. Kotzebue Sound.

107. Conioselinum *Fischeri*, Wimm. et Grah., Hook. Fl. Bor. Amer. vol. i. p. 265.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 619.—*Laserpitium hirsutum*, Hook. et Arn., Bot. Beech. p. 125 (*non Linn.*) fide spec. in Herb. Hook. Kotzebue Sound; Arctic coast (*Pullen*).

CORNACEÆ.

108. Cornus *Suecica*, Linn. Hook. Fl. Bor. Amer. vol. i. p. 277.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 653. Very common in Western Eskimaux-land.

CAPRIFOLIACEÆ.

109. Linnæa *borealis*, Gronov., Hook. Fl. Bor. Amer. vol. i. p. 285.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 3. Kotzebue Sound; Fort Simpson to Bear Lake River (*Pullen*).

RUBIACEÆ.

110. Galium *boreale*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 289.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 25.—*G. rubioides*, Hook. et Arn., Bot. Beech. p. 125 (*non Linn.*) fide spec. in Herb. Hook. Kotzebue Sound and river Buckland; Fort Simpson to Bear Lake River (*Pullen*).

VALERIANEÆ.

111. Valeriana *capitata*, Willd., Hook. Fl. Bor. Arn. vol. i. p. 292.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 48. From Kotzebue Sound to Cape Lisburne; between Point Barrow and Mackenzie River (*Pullen*).

COMPOSITÆ.

112. Nardosmia *corymbosa*, Hook. Fl. Bor. Amer. vol. i. p. 307.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 93. Kotzebue Sound; between Point Barrow and Mackenzie River, and in Richard's Isle (*Pullen*).

113. Aster *montanus*, Richards., Torr. et Gray, Fl. of N. Amer. vol. ii. p. 107.—Hook. Fl. Bor. Amer. vol. ii. p. 7. Kotzebue Sound; from Point Barrow to Bear Lake River (*Pullen*).

114. Erigeron *uniflorum*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 17.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 169. Cape Lisburne; Wainwright Inlet.

115. Solidago *Virga-aurea*, Linn., var. *multiradiata*, Torr. et Gray, Fl. of N. Amer. vol. ii. p. 207.—*S. multiradiata*, Ait., Hook. Fl. Bor. Amer. vol. ii. p. 5. From Kotzebue Sound to Cape Lisburne; between Fort Good Hope and Point Separation (*Pullen*).

116. Achillea *Millefolium*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 318.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 409. St. Michael, Norton Sound; Great Slave Lake (*Pullen*).

117. Leucanthemum *integrifolium*, De Cand., Torr. et Gray, Fl. of N. Amer. vol. ii. p. 412.—*Chrysanthemum integrifolium*, Rich., Hook. Fl. Bor. Amer. vol. i. p. 319. Kotzebue Sound; between Point Barrow and Mackenzie River (*Pullen*).

118. Leucanthemum *arcticum*, De Cand., Torr. et Gray, Fl. of N. Amer. vol. ii. p. 412.—*Chrysanthemum arcticum*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 319. From Kotzebue Sound to Wainwright Inlet.

119. Matricaria *inodora*, Linn., Torr. et Gray, Fl. of N. Amer. vol. ii. p. 412.—*Pyrethrum inodorum*, Smith, Hook. Fl. Bor. Amer. vol. i. p. 320. Kotzebue Sound; Point Hope.

M. inodora, Linn., *β? nana*, Torr. et Gray, l. c.—*Pyrethrum inodorum, β nanum*, Hook. l. c. Kotzebue Sound.

M. inodora, Linn., *γ eligulata*, Seem.; robustior, capitulis ligulis destitutis. St. Michael, Norton Sound.

Var. *γ* is more robust than the preceding ones, and, being rayless, it may prove a distinct species.

120. Artemisia *borealis*, Pall., Hook. Fl. Bor. Amer. vol. i. p. 326.—Torr. et Gray, Fl. of N. Amer. vol. i. p. 416. Herald Island; between Point Barrow and Mackenzie River (*Pullen*).

121. Artemisia *vulgaris*, Linn., Hook. Fl. Bor. Amer. vol. i. p. 322.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 421. From Norton Sound to Cape Lisburne; between Point Barrow and Bear Lake River (*Pullen*).

A. vulgaris, Linn., *β Tilesii*, Seem.—*A. Tilesii*, Ledeb. in Mem. Acad. St. Petersb. vol. v. p. 568.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 421. Common throughout Western Eskimaux-land, growing with *A. vulgaris*.

Besides var. *β*, there are several forms of *A. vulgaris* in the collection.

122. Artemisia *arctica*, Bess. in Hook. Fl. Bor. Amer. vol. i. p. 323. *A. arctica*, Torr. et Gray, Fl. Bor. Amer. vol. ii. p. 423. n. 27, *ex parte*. Cape Lisburne; Point Hope.

123. Artemisia *Chamissoniana*, Bess. in Hook. Fl. Bor. Amer. vol. i. p. 324.—*A. arctica*, Torr. et Gray, Fl. of N. Amer. vol. ii. p. 423. n. 27, *ex parte*. Cape Lisburne.

The latter two species, though united by Torrey and Gray, I cannot but regard as distinct. They may at once be distinguished by their habit. *A. arctica* forms dense cæspitose masses, has leaves of a lively green colour, and sends up isolated, almost leafless scapes. *A. Chamissoniana* partakes more of the habit of *A. vulgaris*. Few of the stems are sterile, nearly all shoot up and produce flowers; the foliage is of a dull green colour, and the flowering stem is clothed with many leaves, and cannot be called a scape, being unlike that of *A. arctica*, *A. glomerata*, *A. androsacea*, etc.

124. Artemisia *glomerata*, Ledeb., Hook. Fl. Bor. Amer. vol. i. p. 324.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 423. Cape Lisburne.

The specimens gathered at Cape Lisburne agree in every respect with the Asiatic ones distributed by Ledebour, and show that *A. glomerata* is closely allied to, though quite distinct from, *A. globularia*, Cham.

125. Artemisia (§ Abrotanum) *androsacea*, Seem. (Plate VI.); suffruticosa cæspitosa dense flavo sericeo-villosissima, foliis cæspitum rosulatis oblongis trifidis, caulinis 3–5-fidis, lobis obtusis, bracteis trifidis vel integerrimis, capitulis corymboso-capitatis globosis, involucri squamis obovato-oblongis obtusis margine dentatis sphacellatis, corolla glaberrima.—*A. glomerata*, Hook. et Arn., Bot. Beech. p. 125. (*non Ledeb.*). Kotzebue Sound (*Beechey*).

A low cæspitose plant, forming dense tufts, and resembling some of the silky *Androsaces*. The specimen (the only one that exists in Sir William Hooker's Herbarium) from which the description is taken is about four inches high. The radical leaves are a quarter of an inch, the cauline ones about half an inch long. The scales of the involucre are toothed, and, like those of most of the allied species, brown on the edge. The corolla is of a pale yellow colour. The fruit is not far enough advanced to admit of any remark. The authors of 'Beechey's Botany,' when publishing the name quoted above, entertained some doubts whether the specimen then before them could belong to the true *A. glomerata*, Ledeb., and remarked that the tufts were looking more like some silky *Androsace* than anything of the Order *Compositæ*. With a complete set of authentic specimens I had no difficulty in settling the doubt, and confidently describe the plant as a new species, distinct from all other *Artemisiæ* by the long silky hair, which is so dense that great difficulty is experienced in making a fit drawing. The outline will either turn out too clear, and give an unnatural aspect to the plant, or, if the hair is represented as it ought to be, the figure becomes unintelligible. It is to be hoped, however, that the representation given will answer every botanical purpose.

Plate VI. Fig. 1 and 2, cauline leaves; 3, radical leaf; 4, a head of flowers; 5, a scale of the involucre; 6, a flower of the ray with a portion of the receptacle attached to it; 7, a flower of the disc; 8, a pair of stamens:—*all magnified*.

126. Antennaria *alpina*, Gærtn., Hook. Fl. Bor. Amer. vol. i. p. 329.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 430. Wainwright Inlet.

127. Senecio *palustris*, Hook., var. *congestus*, Hook., Fl. Bor. Amer. vol. i. p. 334.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 438. Kotzebue Sound; and the form with densely capitate flowers at Wainwright Inlet, and, according to Pullen, between Point Barrow and Mackenzie River.

128. Senecio *Hookeri*, Torr. et Gray, Fl. of N. Amer. vol. ii. p. 438.—*S. integrifolius*, Hook. Fl. Bor. Amer. vol. i. p. 335, excl. synon. Kotzebue Sound.

129. Senecio *lugens*, Richards., Hook. Fl. Bor. Amer. vol. i. p. 332. t. 114.—*S. Kalmii*, Hook. et Arn., Bot. Beech. p. 126.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 439. Port Clarence; Kotzebue Sound; Arctic coast (*Pullen*).

130. Senecio *resedifolius*, Less., Hook. Fl. Bor. Amer. vol. i. p. 333. t. 117.—*Cineraria lyrata*, Ledeb., Hook. et Arn. Bot. Beech. p. 126. Cape Lisburne.

131. Senecio *frigidus*, Less., Hook. Fl. Bor. Amer. vol. i. p. 334. t. 112.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 445. Cape Lisburne; Garry Isle and Pelly Isle (*Pullen*).

132. Senecio *Pseudo-Arnica*, Less., Hook. Fl. Bor. Amer. vol. i. p. 334. t. 113.—Torr. et Gray, l. c. Very common along the shores of Eskimaux-land.

133. Arnica *angustifolia*, Vahl, Hook. Fl. Bor. Amer. vol. i. p. 330.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 449. From Kotzebue Sound to Cape Lisburne.

134. Saussurea *monticola*, Richards., De Cand., Prodr. vol. vi. p. 535.—Hook. Fl. Bor. Amer. vol. i. p. 303. From Kotzebue Sound to Cape Lisburne; between Point Barrow and Mackenzie River (*Pullen*), growing in peat.

135. Saussurea *subsinuata*, Ledeb. (Plate VII.); caule foliisque glabratis, foliis inferioribus sinuato-repandis, superioribus lanceolato-linearibus semidecurrentibus, corymbo coarctato, involucri squamis acuminatis subæqualibus, receptaculo nudo. ♃.—Ledeb. in De Cand. Prodr. vol. vi. p. 536. Kotzebue Sound, always growing in clay, or in gravel or sand.

A perennial, glabrous herb, about a foot and a half high, with flowers of a dirty white or bluish colour. This species has not yet been received into the Floras of America, though previously found by Eschscholtz in Western Eskimaux-land. I collected it in two successive seasons, both times in Kotzebue Sound, to which, indeed, it seems to be confined; at all events it does not venture further northward, being a much more tender plant that *S. monticola*, killed by the first slight night-frost in the beginning of September.

Plate VII. Fig. 1, a head of flowers; 2, a portion of the receptacle, with some scales of the involucre; 3, a flower; 4, a pappus; 5, a stamen:—*all magnified.*

136. Taraxacum *Dens-leonis*, Dest., De Cand. Prodr. vol. vii. p. 145.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 494.—*Leontodon Taraxacum*, Linn., Hook. Fl. Bor. Amer. vol. i. 296. From Kotzebue Sound to Point Hope; from Fort Simpson to Great Bear Lake River (*Pullen*).

137. Taraxacum *palustre*, De Cand., Prodr. vol. vii. p. 148.—Torr. et Gray, Fl. of N. Amer. vol. ii. p. 494.—*Leontodon palustre*, Smith, Hook. Fl. Bor. Amer. vol. i. p. 296. Kotzebue Sound.

CAMPANULACEÆ.

138. Campanula *lasiocarpa*, Alph. De Cand., Prodr. vol. vii. p. 482.—Hook. Fl. Bor. Amer. vol. ii. p. 28. Kotzebue Sound, on the slopes of the hills.

139. Campanula *uniflora*, Alph. De Cand., Prodr. vol. vii. p. 482.—Hook. Fl. Bor. Amer. vol. ii. p. 29. Cape Lisburne.

VACCINIEÆ.

140. Vaccinium *uliginosum*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 32.—De Cand. Prodr. vol. vii. p. 574. Very common in Kotzebue Sound; Arctic coast (*Pullen*); Baffin's Bay (*Ede*).

141. Vaccinium *Vitis-idæa,* Linn., Hook. Fl. Bor. Amer. vol. ii. p. 34.—De Cand. Prodr. vol. vii. p. 568. From Norton Sound to Point Barrow; from Point Simpson to Great Bear Lake River (*Pullen*); Bushnan Island (*Penny*).

142. Oxycoccos *vulgaris,* Pursh, Fl. Amer. Sept. vol. i. p. 263.—*Vaccinium oxycoccos,* Linn., Hook. Fl. Bor. Amer. vol. ii. p. 34.—De Cand. Prodr. vol. vii. p. 577. Kotzebue Sound.

ERICEÆ.

143. Arctostaphylos *alpina,* Sprengel, De Cand. Prodr. vol. vii. p. 584.—*Arbutus alpina,* Hook. Fl. Bor. Amer. vol. ii. p. 37. From Norton Sound to Point Barrow; from Fort Good Hope to Point Separation (*Pullen*); Northumberland Inlet (*Penny*).

144. Andromeda *polifolia,* Linn., Hook. Fl. Bor. Amer. vol. ii. p. 38.—De Cand. Prodr. vol. vii. p. 606. Kotzebue Sound.

145. Cassandra *calyculata,* G. et D. Don, De Cand. Prodr. vol. vii. p. 610.—*Andromeda calyculata,* Linn., Hook. Fl. Bor. Amer. vol. ii. p. 39. Kotzebue Sound.

146. Cassiope *tetragona,* G. et D. Don, De Cand. Prodr. vol. vii. p. 611.—*Andromeda tetragona,* Linn., Hook. Fl. Bor. Amer. vol. ii. p. 44. Wainwright Inlet; Cape Lisburne; from Point Barrow to Mackenzie River, and in Garry Isle (*Pullen*); Ichsuti (*Ede*); Buchan Island (*Penny*).

147. Loiseleuria *procumbens,* Desv., De Cand. Prodr. vol. vii. p. 714.—*Azalea procumbens,* Linn., Hook. Fl. Bor. Amer. vol. ii. p. 44. Chamisso Island; Cape Lisburne; Whale Fish Island (*Ede*).

148. Rhododendron *Lapponicum,* Wahlenb., Hook. Fl. Bor. Amer. vol. ii. p. 43.—De Cand. Prodr. vol. vii. p. 724. Port Clarence; Garry Isle (*Pullen*).

149. Ledum *palustre,* Linn., Hook. Fl. Bor. Amer. vol. ii. p. 44.—De Cand. Prodr. vol. vii. p. 730. From Norton Sound to Point Barrow, very common; from Point Barrow to Mackenzie River, and in Richard Isle (*Pullen*).

PYROLACEÆ.

150. Pyrola *rotundifolia,* Linn., Hook. Fl. Bor. Amer. vol. ii. p. 46.—De Cand. Prodr. vol. vii. p. 172.—Meyer, Fl. des Königr. Hannov. t. 12 (*icon. optiss.*). Eschscholtz Bay, banks of the river Buckland; Richard Isle, and from Point Barrow to Great Slave Lake (*Pullen*); Whale Fish Island (*Ede*); Northumberland Inlet (*Penny*).

GENTIANEÆ.

151. Gentiana *glauca,* Pall., Hook. Fl. Bor. Amer. vol. ii. pp. 59. t. 147.—De Cand. Prodr. vol. ix. p. iii. Wainwright Inlet.

152. Gentiana *prostrata,* Hænk., Hook. Fl. Bor. Amer. vol. ii. p. 60.—De Cand. Prodr. vol. ix. p. 106. Port Clarence.

153. Gentiana *propinqua,* Rich., Hook. Fl. Bor. Amer. vol. ii. p. 62.—De Cand. Prodr. vol. ix. p. 100. Port Clarence.

154. Gentiana *tenella*, Fries, Hook. Fl. Bor. Amer. vol. ii. p. 63.—De Cand. Prodr. vol. ix. p. 98. Kotzebue Sound.

155. Pleurogyne *rotata*, Griseb., Hook. Fl. Bor. Amer. vol. ii. p. 65.—De Cand. Prodr. vol. ix. p. 122. River Buckland, near Elephant Point; from Point Barrow to Mackenzie River (*Pullen*).

POLEMONIACEÆ.

156. Polemonium *cæruleum*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 72.—De Cand. Prodr. vol. ix. p. 317. From Norton Sound to Point Barrow; from Point Barrow to Mackenzie River (*Pullen*).

Several forms of this species were gathered.

157. Phlox *Sibirica*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 73.—De Cand. Prodr. vol. ix. p. 307. Kotzebue Sound.

DIAPENSIACEÆ.

158. Diapensia *Lapponica*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 76. Cape Lisburne; Whale Fish Island (*Ede*).

BORAGINEÆ.

159. Mertensia *maritima*, G. Don, De Cand. Prodr. vol. x. p. 88.—*Lithospermum maritimum*, Lehm., Hook. Fl. Bor. Amer. vol. ii. p. 86. From Norton Sound to Point Barrow; Cape Bathurst (*Pullen*).

160. Mertensia *pilosa*, De Cand., Prodr. vol. x. p. 90.—*Lithospermum denticulatum*, Lehm., Hook. Fl. Bor. Amer. vol. ii. p. 87. River Buckland; Kotzebue Sound.

161. Myosotis *sylvatica*, Hoffm., De Cand. Prodr. vol. x. p. 107.—*M. alpestris*, Schmidt, Hook. Fl. Bor. Amer. vol. ii. p. 81. Cape Lisburne; from Point Barrow to Mackenzie River (*Pullen*).

162. Eritrichium *aretioides*, Alph. De Cand. (Plate VIII.); dense cæspitosum pilis sericeis vix basi tuberculosis vestitum, foliis imbricatis elliptico-lanceolatis acutis, racemulis paucifloris breviter exsertis conglobatis basi bracteatis, calycibus albo-villosissimis. ♃.—De Cand. Prodr. vol. x. p. 125.—*Myosotis aretioides*, Cham. in Linnæa, 1829, p. 443. Cape Lisburne.

A small cæspitose herb, which has more the look of a crippled *Myosotis* than a well developed plant. Chamisso found it in the island of St. Lawrence, I at Cape Lisburne; the latter is not only the northernmost but also the only station of the American continent as yet known.

Plate VIII. Fig. 1, flower; 2, corolla cut open; 3, stamen; 4, ovary and style; 5, immature achenium; 6, ripe achenium; 7, longitudinal section of achenium; 8 and 9, seed; 10 and 11, embryo:—*all magnified.*

SCROPHULARINEÆ.

163. Castilleja *pallida*, Kunth, De Cand. Prodr. vol. x. p. 531.—Hook. Fl. Bor. Amer. vol. ii. p. 105. Chamisso Island; between Fort Simpson and Bear Lake River (*Pullen*).

164. Pedicularis *verticillata*, Linn., De Cand. Prodr. vol. x. p. 563.—Hook. Fl. Bor. Amer. vol. ii. p. 107. Kotzebue Sound; Garry Isle (*Pullen*).

165. Pedicularis *euphrasioides*, Stephan., De Cand. Prodr. vol. x. p. 567.—Hook. Fl. Bor. Amer. vol. ii. p. 109. Chamisso Island.

A biennial plant.

166. Pedicularis *Langsdorfii*, Fisch., De Cand. Prodr. vol. x. p. 567.—Hook. Fl. Bor. Amer. vol. ii. p. 109. Kotzebue Sound.

167. Pedicularis *Sudetica*, Willd., De Cand. Prodr. vol. x. p. 568.—Hook. Fl. Bor. Amer. vol. ii. p. 109. Cape Lisburne; between Point Barrow and Mackenzie River (*Pullen*).

168. Pedicularis *versicolor*, Wahlenb., De Cand. Prodr. vol. x. p. 578.—Hook. Fl. Bor. Amer. vol. ii. p. 100. Kotzebue Sound.

169. Pedicularis *hirsuta*, Linn., De Cand. Prodr. vol. x. p. 578.—Hook. Fl. Bor. Amer. vol. ii. p. 109. Kotzebue Sound; Garry Isle (*Pullen*).

170. Pedicularis *capitata*, Adams., De Cand. Prodr. vol. x. p. 581.—Hook. Fl. Bor. Amer. vol. ii. p. 106. Kotzebue Sound; Garry Isle (*Pullen*).

SELAGINEÆ.

171. Gymnandra *Stelleri*, Cham. et Schlecht., De Cand. Prodr. vol. xii. p. 25.—Hook. Fl. Bor. Amer. vol. ii. p. 102. Port Clarence, in clay.

LENTIBULARIEÆ.

172. Pinguicula *villosa*, Linn., De Cand. Prodr. vol. viii. p. 30. Chamisso Island.

PRIMULACEÆ.

173. Primula *nivalis*, Pall., De Cand. Prodr. vol. viii. p. 39. Hook. Fl. Bor. Amer. vol. ii. p. 120. Kotzebue Sound (*Beechey*); Imarook (*Herb. Hook.*). I myself have not found it.

174. Primula *stricta*, Hornem., De Cand. Prodr. vol. viii. p. 44.—*P. Hornemanniana*, Lehm., Hook. Fl. Bor. Amer. vol. ii. p. 120.—*P. Mistassinica?* Hook. et Arn. Bot. Beech. p. 129!—*P. saxifragifolia*, Hook. et Arn. l. c.! (fide spec. in Herb. Hook.) Kotzebue Sound; Wainwright Inlet.

175. Androsace *Chamæjasme*, Willd., De Cand. Prodr. vol. viii. p. 51.—Hook. Fl. Bor. Amer. vol. ii. p. 119. From Kotzebue Sound to Wainwright Inlet.

176. Androsace *septentrionalis*, Linn., De Cand. Prodr. vol. viii. p. 52.—Hook. Fl. Bor. Amer. vol. ii. p. 119. Chamisso Island.

177. Dodecatheon *frigidum*, Cham. (Plate IX.); foliis oblongo-ovatis integerrimis subrepandis obtusis in petiolum coarctatis, scapo 1–5-floro, pedunculis divaricatis, involucri foliis anguste lanceolatis, calycis laciniis lanceolatis acutis integerrimis, filamentis in tubum brevissimum connatis, antheris acutis. ♃.—De Cand. Prodr. vol. viii. p. 56.—Hook. Fl. Bor. Amer. vol. ii. p. 119. Cape Lisburne; Kotzebue Sound.

This *Dodecatheon* is not, as was thought, an endemic species of Western Eskimaux-land; having been found in St. Lawrence Bay (*Chamisso* and *Eschscholtz*), on the Rocky Mountains (*D. Douglas*), and on the Arctic shores of Eastern America (*Captain Back*). It is a beautiful plant. The foliage is of a lively green; the number of flowers varies from one to five, but is generally three; the corolla is purplish-violet, at the base yellowish-white.

Plate IX. Fig. 1, flower; 2, stamen; 3, pollen-masses; 4, ovary and style; 5, ovary cut open; 6, receptacle with a few ovules attached to it; 7, ovule; 8, calyx, fruit, and style; 9, fruit, not quite ripe:—*all magnified.*

PLUMBAGINEÆ.

178. Armeria *arctica*, Wallr., De Cand. Prodr. vol. xii. p. 679. Kotzebue Sound; Arctic coast (*Pullen*).

SALSOLACEÆ.

179. Atriplex *littoralis*, Linn., De Cand. Prodr. vol. xiii. p. 96.—Hook. Fl. Bor. Amer. vol. ii. p. 128. Eschscholtz Bay.

POLYGONEÆ.

180. Oxyria *reniformis*, Hook., Fl. Bor. Amer. vol. ii. p. 129. Cape Lisburne; Assistance Bay, and Northumberland Inlet (*Penny*); Whale Fish Island (*Ede*).

181. Rumex *Acetosa*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 129. Kotzebue Sound.

182. Rumex *domesticus*, Hartm., Hook. Fl. Bor. Amer. vol. ii. p. 129. From Kotzebue Sound to Wainwright Inlet.

In the beginning of the summer handfulls of this Sorrel are eaten by the Eskimaux in order to arrest the ravages of the scurvy.

183. Polygonum *Bistorta*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 130. From Kotzebue Sound to Point Barrow; Mackenzie River, and Garry Isle (*Pullen*).

The Eskimaux call this plant Mashu, and eat the root, after having roasted it in the ashes.

184. Polygonum *viviparum*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 130. Wainwright Inlet; Assistance Bay (*Penny*); between Point Barrow and Mackenzie River (*Pullen*).

185. Polygonum *alpinum*, All., Hook. Fl. Bor. Amer. vol. ii. p. 131. Eschscholtz Bay, plentiful on the ice-cliffs.

EMPETREÆ.

186. Empetrum *nigrum*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 140. Common from Norton Sound to Point Barrow; Richard's Isle (*Pullen*); Northumberland Inlet (*Penny*); Whale Fish Island (*Ede*).

SALICINEÆ.

187. Salix *villosa*, Don, Hook. Fl. Bor. Amer. vol. ii. p. 144. From Kotzebue Sound to Cape Lisburne; Point Separation (*Pullen*).

About Kotzebue Sound this species is about five feet high, but, like all Willows, gradually decreases in size on approaching the higher latitudes, and at Cape Lisburne it is only in sheltered positions from one to two feet high. The specimens agree perfectly with the description in the 'Flora Boreali-Americana.'

188. Salix *speciosa*, Hook. et Arn. (Plate X.); arborea, ramis densissime albido vel flavo-sericeis, foliis oblongo-lanceolatis subobvatisve acutis vel acuminatis integerrimis supra nudiusculi subtus petiolisque niveo-tomentosis, stipulis persistentibus lineari-lanceolatis subulatisve membranaceis fuscis petiolo longioribus, amentis subcoætaneis lateralibus elongatis crassis densissime sericeis, squamis nigrescentibus longitudine fere ovarii pilis longis mollissimis sericeis, ovariis ovato-acuminatis sessilibus sericeis, stylo longissimo, stigmatibus bipartitis. ♄.—Hook. Fl. Bor. Amer. vol. ii. p. 145.—Hook. et Arn. Bot. Beech. p. 130. From Norton Sound to Cape Lisburne; from Fort Simpson to Great Bear Lake (*Pullen*).

On the banks of the river Buckland this species is a tree from sixteen to twenty feet high, forming thickets; in Kotzebue Sound it reaches the height of about eight feet; at Cape Lisburne it is two feet high, and further to the north, not seen.

Plate X. Fig. 1, branch with male flowers; 2 and 3, male flowers; 4, branch with female flower; 6, ovary and style; 7, catkin with ripe carpels; 8, ripe carpel:—*all, except* 1, 4, *and* 7, *magnified.*

189. Salix *Richardsoni*, Hook. Fl. Bor. Amer. vol. ii. p. 147. t. 172. From Kotzebue Sound to Cape Lisburne.

The specimens collected in Western Eskimaux-land differ from those collected on the Mackenzie river, by having the ovaries covered with a slight down. No other difference is perceptible.

190. Salix *Uva-ursi*, Pursh; decumbens, ramis foliisque pubescentibus vel demum glabris, foliis coriaceis obovatis vel oblongis obtusis vel emarginatis integerrimis vel versus basim subdenticulatis supra nitidis subtus glaucescentibus, stipulis caducis, amentis coætaneis terminalibus, squamis cuneato-obovatis obtusis pilosis ovario multo brevioribus, ovariis glaberrimis, stigmatibus bipartitis. ♄.—Pursh, Fl. Amer. Sept. vol. ii. p. 610. Wainwright Inlet; between Point Barrow and Mackenzie River (*Pullen*); Kotzebue Sound, and Island of St. Paul (*Chamisso*).

Without authentic specimens it is almost impossible to determine any of the Willows, except a few well-marked species. Of *S. Uva-ursi* nothing appears to be known save the short diagnosis given in the Fl. Amer. Sept., and Pursh himself does not seem to have seen any but cultivated specimens. I do not think, however, that I am wrong in naming the specimens before me *S. Uva-ursi*. Both Erman and Chamisso gathered specimens agreeing with those collected by myself and Pullen. Chamisso, according to a manuscript note in the Hookerian Herbarium, referred his with a query to *S. myrtilloides*, but that species is always erect, even when growing in Lapland, and has thin, delicate leaves, while *S. Uva-ursi* is decumbent, and has a thick, coriaceous foliage. If I am right in referring all the specimens to one species, the geographical range of *S. Uva-ursi* extends from Siberia to Labrador.

191. Salix *reticulata*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 151. Cape Lisburne; Pelly's Isle, and between Fort Simpson and Great Bear Lake (*Pullen*).

192. Salix *arctica*, R. Brown, Hook. Fl. Bor. Amer. vol. ii. p. 152. Cape Lisburne; Pelly's Isle (*Pullen*); Assistance Bay (*Penny*).

193. Salix *retusa*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 153. Kotzebue Sound; Pelly's Isle (*Pullen*).

194. Salix *polaris*, Wahl., Hook. Fl. Bor. Amer. vol. ii. p. 153. Wainwright Inlet.

BETULINEÆ.

195. Betula *nana*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 156.—Endl. Gen. Pl. suppl. iv. p. 20. Common from Norton Sound to Point Barrow.

196. Alnus *viridis*, De Cand., Hook. Fl. Bor. Amer. vol. ii. p. 157.—Endl. Gen. Pl. suppl. iv. p. 20. From Norton Sound to Kotzebue Sound; Point Separation to Mackenzie River (*Pullen*).

CONIFERÆ.

197. Pinus (*Abies*) *alba*, Ait., Hook. Fl. Bor. Amer. vol. ii. p. 163.—Endl. Synop. Conifer. p. 112. On the banks of the river Noatak (*Bedford Pim*), and on those of the Buckland.

The northernmost tree on the north-western coast of America, forming forests on the banks of the river Noatak, being nearly seven degrees further north than the limits of the woods extend on the eastern shores of the continent. Some of the trees measured by Lieut. Bedford Pim, R.N., were from twenty to fifty feet high, and from four to five feet in circumference. Sections of them are preserved in the Museum of the Royal Botanic Gardens, Kew. The specimens in the Herbarium differ somewhat in aspect from those grown in more genial climates, and two botanists of eminence expressed the opinion that my specimens did not belong to *Pinus alba*, but to some allied, perhaps new, species. With due reverence for an opinion coming from such quarters, I still feel convinced that the Spruce of Western Eskimaux-land is the true *P. alba* of Aiton, and that the strange aspect is merely owing to physical influence, which in this case, as in many others, stamps upon the species the true arctic character. The only species to which *P. alba* seems to be allied is *P. Sitchensis*, Bong. (Endl. Synop. Conif. p. 123), but the scales of the cone of that plant are always toothed, while those of *P. alba* are entire.

TYPHACEÆ.

198. Sparganium *natans*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 169. Kotzebue Sound.

MELANTHACEÆ.

199. Zigadenus *chloranthus*, Richards., Hook. Fl. Bor. Amer. vol. ii. p. 177. Port Clarence; Fort Good Hope to Point Separation, and between Fort Simpson and Great Bear Lake (*Pullen*).

200. Tofieldia *coccinea*, Richards., Hook. Fl. Bor. Amer. vol. ii. p. 179.—Hook. et Arn. Bot. Beech. p. 130. t. 29. Chamisso Island; Cape Lisburne.

ASPHODELEÆ.

201. Anthericum *serotinum*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 183. Cape Lisburne.

202. Allium *Schœnoprasum*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 185. Port Clarence; Kotzebue Sound.

JUNCEÆ.

203. Luzula *melanocarpa*, Desv., Hook. Fl. Bor. Amer. vol. ii. p. 187. Kotzebue Sound.

204. Luzula *campestris*, Desv., Hook. Fl. Bor. Amer. vol. ii. p. 188. Kotzebue Sound.

205. Luzula *spicata*, Desv., Hook. Fl. Bor. Amer. vol. ii. p. 188. Kotzebue Sound.

206. Luzula *arcuata*, Hook., Fl. Bor. Amer. vol. ii. p. 189. Kotzebue Sound.

207. Juncus *Balticus*, Willd., Hook. Fl. Bor. Amer. vol. ii. p. 189. St. Michael, Norton Sound.

208. Juncus *castaneus*, Smith, Hook. Fl. Bor. Amer. vol. ii. p. 192. Kotzebue Sound.

ORCHIDEÆ.

209. Corallorhiza *innata*, R. Brown, Hook. Fl. Bor. Amer. p. 194. Kotzebue Sound.

210. Platanthera *obtusata*, Lindl., Hook. Fl. Bor. Amer. vol. ii. p. 196. Kotzebue Sound; between Fort Simpson and Great Slave Lake (*Pullen*).

IRIDEÆ.

211. Iris *Sibirica*, Linn., Dav. Dietr. Synop. Pl. vol. i. p. 143. Kotzebue Sound; Norton Sound.

CYPERACEÆ.

212. Carex *atrata*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 216. Kotzebue Sound.

213. Carex *Gmelini*, Hook., Fl. Bor. Amer. vol. ii. p. 216. Kotzebue Sound.

214. Carex *rigida*, Good., Transact. of Linn. Soc. vol. ii. p. 193. t. 22. Kotzebue Sound.

215. Carex *cæspitosa*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 217. Kotzebue Sound; Arctic coast (*Pullen*).

216. Carex *stricta*, Good., Hook. Fl. Bor. Amer. vol. ii. p. 218. Kotzebue Sound.

217. Carex *saxatilis*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 218. Kotzebue Sound.

218. Carex *membranacea*, Hook., Fl. Bor. Amer. vol. ii. p. 220.—Hook. et Arn. Bot. Beech. p. 131. Kotzebue Sound.

219. Carex *fuliginosa*, Sternb., Hook. Fl. Bor. Amer. vol. ii. p. 224. Kotzebue Sound.

220. Eriophorum *capitatum*, Host., Hook. Fl. Bor. Amer. vol. ii. p. 231. From Norton Sound to Point Barrow; Mackenzie River (*Pullen*); Baffin Bay (*Ede*).

221. Eriophorum *polystachyon*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 231. From Norton Sound to Point Barrow; Hutchinson's Bay (*Pullen*); Assistance Bay (*Penny*).

222. Eriophorum *angustifolium*, Roth, Hook. Fl. Bor. Amer. vol. ii. p. 231. Kotzebue Sound.

The Eskimaux use the silky hair of the Cotton-grasses instead of tinder.

GRAMINEÆ.

223. Alopecurus *alpinus*, Smith, Hook. Fl. Bor. Amer. vol. ii. p. 234. Point Hope; Arctic coast (*Pullen*); Bushnan Island, and Assistance Bay (*Penny*); Ibgi (*Ede*).

224. Hierochloe *borealis*, Rœm. et Schult., Hook. Fl. Bor. Amer. vol. ii. p. 234. Kotzebue Sound.

225. Hierochloe *alpina*, Rœm. et Schult., Hook. Fl. Bor. Amer. vol. ii. p. 234. Kotzebue Sound; Bushnan Island (*Penny*).

226. Phippsia *monandra*, Trin., Hook. Fl. Bor. Amer. vol. ii. p. 238. Kotzebue Sound; Wainwright Island; Assistance Bay (*Penny*).

227. Colpodium *latifolium*, R. Brown, Hook. Fl. Bor. Amer. vol. ii. p. 238. Kotzebue Sound; Arctic coast (*Pullen*).

228. Colpodium *arundinaceum*, Hook., Fl. Bor. Amer. vol. ii. p. 238.—*Vilfa arundinacea*, Trin., Hook. et Arn. Bot. Beech. p. 132. Kotzebue Sound.

229. Calamagrostis *Canadensis*, Beauv., Hook. Fl. Bor. Amer. vol. ii. p. 240. Kotzebue Sound.

230. Calamagrostis *stricta*, Rich., Hook. Fl. Bor. Amer. vol. ii. p. 240. Kotzebue Sound.

231. Deschampsia *brevifolia*, R. Brown, Hook. Fl. Bor. Amer. vol. ii. p. 242. Kotzebue Sound.

232. Dupontia *Fischeri*, R. Brown, Hook. Fl. Bor. Amer. vol. ii. p. 242. Kotzebue Sound; Hutchinson's Bay (*Pullen*).

233. Trisetum *subspicatum*, Beauv., Hook. Fl. Bor. Amer. vol. ii. p. 244. Wainwright Inlet; between Point Barrow and Mackenzie River (*Pullen*).

234. Poa *cenisia*, All., Kunth Enumerat. Plant. vol. i. p. 350. Cape Lisburne; Assistance Bay, and Bushnan Island (*Penny*).

235. Poa *arctica*, R. Brown, Hook. Fl. Bor. Amer. vol. ii. p. 246. Kotzebue Sound.

236. Poa *pratensis*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 246. Kotzebue Sound; between Fort Simpson and Great Slave Lake (*Pullen*).

237. Poa *nemoralis*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 246. Kotzebue Sound; between Fort Simpson and Great Slave Lake (*Pullen*).

238. Poa *angustata*, R. Brown, Hook. Fl. Bor. Amer. vol. ii. p. 247. Herald Island.

239. Festuca *ovina*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 250. Kotzebue Sound.

240. Festuca *rubra*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 250.—*F. duriuscula*, Hook. et Arn., Bot. Beech. p. 132. Kotzebue Sound.

241. Bromus *purgans*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 252. Kotzebue Sound; between Fort Simpson and Great Bear Lake (*Pullen*).

242. Elymus *arenarius*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 255. From Norton Sound to Point Barrow.

FILICES.

(*Auctore John Smith.*)

243. Lastræa *spinulosa*, Presl.—*Aspidium spinulosum*, Sw., Willd. Sp. Pl. vol. v. p. 262. Chloris Peninsula, Kotzebue Sound.

This species is also found in middle and northern Europe, and in North America generally.

244. Lastræa *fragrans*, Presl.—*Aspidium fragrans*, Swartz, Willd. Sp. Pl. vol. v. p. 253. River Buckland (*R. Maguire*); Chloris Peninsula, Kotzebue Sound.

Diffused over the Arctic and Subarctic regions: Siberia, Dahuria, Kamtchatka, and the island of Igloolik.

245. Cystopteris *tenuis*, Schlecht.—*Aspidium tenue*, Swartz, Willd. Sp. Pl. vol. v. p. 279. *Cystopteris fragilis*, Hook., Sp. Filic. vol. i. p. 198. Chloris Peninsula, Kotzebue Sound.

This species is spread over the temperate and subfrigid countries of the northern hemisphere; and, if all the synonyms of *C. fragilis* belong to one species only, then it is found in the West Indies, Mexico, Chili, Subantarctic countries, Japan and Cashmere. The specimens from Kotzebue Sound represent the American form, the *Aspidium tenue* of Swartz. Sir W. J. Hooker places all the forms under *C. fragilis*, Bernh.

LYCOPODINEÆ.

246. Lycopodium *Selago*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 266. Kotzebue Sound.

247. Lycopodium *annotinum*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 266. Kotzebue Sound.

EQUISETACEÆ.

248. Equisetum *sylvaticum*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 269. Kotzebue Sound.

249. Equisetum *arvense*, Linn., Hook. Fl. Bor. Amer. vol. ii. p. 269. St. Michael, Norton Sound.

MUSCI.

(*Auctore W. Wilson.*)

250. Sphagnum *fimbriatum*, Wils. et J. D. Hook., in Hook. Fl. Antarctic Crypt. p. 92.—*S. acutifolium*, Hook. et Arn. in Bot. Beech. p. 133. Kotzebue Sound.

Var. ramis dense compactis, foliis brevioribus subellipticis. Norton Sound.

"This moss is used by the Eskimaux as wicks for lamps.—*B. S.*"

251. Polytrichum *cavifolium*, Wils. MSS.; caule simplici breviusculo, foliis dissitis oblongo-ellipticis integerrimis concavis acutiusculis nervo angustiore parce lamellato, capsula subcylindrica incurviuscula peristomio longiore, calyptra nuda.—*P. lævigatum*, Hook. et Arn. in Bot. Beech. p. 133. Kotzebue Sound.

This species differs from *P. lævigatum* of Hook. Musc. Exot. in having the capsule longer and narrower, not contracted at the mouth, teeth of the peristome twice as long, leaves longer and narrower, less obtuse, almost apiculate, margin entire, not crenulate.

252. Polytrichum *juniperinum*, Willd., Bridel, vol. ii. p. 136. Kotzebue Sound.

P. juniperinum, Willd., var. *strictum*, Bruch et Schimp., Bryol. Europ.—*P. strictum*, Bridel, vol. ii. p. 139. Kotzebue Sound.

P. juniperinum, Willd., var. foliis distantibus angustioribus patulis (male plant only).—*P. Antillarum*, Bridel, Bryol. Univ. vol. ii. p. 747.—*P. appressum*, Schwæg., Suppl. t. 152. Kotzebue Sound.

253. Polytrichum *sexangulare*, Hoppe, Bruch et Schimp. Bryol. Europ.—Bridel, vol. ii. p. 145. —*P. septentrionale*, Hook. et Tayl., Musc. Brit. Barren specimens from Herald Island.

254. Polytrichum *gracile*, Menzies, Bruch et Schimp. Bryol. Europ.—Bridel, vol. i. p. 154. Kotzebue Sound.

255. Polytrichum *capillare*, Rich., Fl. Amer. Bor. Mich. vol. ii. p. 294.—Schwægr. Suppl. vol. i. part ii. p. 318.—*Polygonatum capillare*, Bridel, Bryol. Univ. vol. ii. p. 127.—*Polytrichum nanum*, Hook. et Arn., p. 133. Kotzebue Sound.

This species differs from *P. unigerum* in the shorter operculum and capsule, and in the narrow, lax foliage, somewhat twisted when dry; the capsule is also more or less cernuous, not erect.

256. Polytrichum *alpinum*, Linn., Hedw., var. foliis capsulisque longioribus.—*Polygonatum alpinum*, Bridel, vol. ii. p. 129; Bruch et Schimp. Bryol. Europ. Kotzebue Sound.

257. Splachnum *mnioides*, Hedw., Bridel, vol. i. p. 240.—Hook. et Tayl.—*Tetraplodon mnioides*, Bruch et Schimp., Bryol. Europ. Kotzebue Sound.

258. Splachnum *sphæricum*, Linn. fil., Bridel, Bryol. Univ. vol. i. p. 256.—Hook. et Tayl. Musc. Brit. St. Michael, Norton Sound.

259. Dicranum *Schraderi*, Schwægr., Bridel, Bryol. Univ. vol. i. p. 415. Kotzebue Sound.

260. Dicranum *scoparium*, Linn., Bridel, Bryol. Univ. vol. i. p. 410.—Hook. et Tayl. Musc. Brit. Kotzebue Sound. Barren specimens.

261. Dicranum *elongatum*, Schwægr., Suppl. t. 43.—Bridel, Bryol. Univ. vol. i. p. 429. Kotzebue Sound.

262. Dicranum *crispum*, Hedw. St. Crypt. vol. ii. t. 33.—Bridel, l. c. vol. i. p. 451.—Hook. et Tayl. Kotzebue Sound.

263. Ceratodon *purpureus*, Bridel, Bryol. Univ. vol. i. p. 480.—*Didymodon purpureum*, Hook. et Tayl. Kotzebue Sound.

264. Distichium *capillaceum*, Bruch et Schimp., Bryol. Europ.—*Didymodon capillaceus*, Hook. et Tayl.—Bridel, l. c. vol. i. p. 504. Kotzebue Sound.

265. Racomitrium *lanuginosum*, Bruch et Schimp., Bryol. Europ.—Bridel, l. c. vol. i. p. 215. Kotzebue Sound.

266. Conostomum *boreale*, Swartz, Bridel, l. c. vol. i. p. 150. Kotzebue Sound.

267. Aulacomnion *turgidum*, Schwægr., Bruch et Schimp. Bryol. Europ.—*Arrhenopterum turgidum*, Wahlenb., Bridel, l. c. vol. ii. p. 11. Kotzebue Sound.

268. Aulacomnion *palustre*, Schwægr., Bruch et Schimp. Bryol. Europ.—*Mnium palustre*, Bridel, vol. ii. p. 8.—*Bryum palustre*, Hook. et Tayl. Kotzebue Sound.

Of this species there are several forms in the collection; but they are all barren.

269. Bryum *nutans*, Schreb. Bridel, l. c. vol. i. p. 634. Kotzebue Sound.

270. Bryum *inclinatum*, Bruch et Schimp., Bryol. Europ.—*Polia inclinata*, Swartz, Musc. Suec.—*Cladodium inclinatum*, Bridel, l. c. vol. ii. p. 621. Kotzebue Sound.

271. Bryum *lacustre*, Bridel, Bryol. Univ. vol. i. p. 637.—Bruch et Schimp. Bryol. Europ. Kotzebue Sound and Herald Island.

272. Mnium *rostratum*, Schwægr., Suppl. t. 79.—*Bryum rostratum*, Hook. et Tayl. Kotzebue Sound.

273. Hypnum *nitens*, Dill., Schreb., Bridel, l. c. vol. ii. p. 560.—Hook. et Tayl. l. c. Specimens with male flowers only. Kotzebue Sound.

274. Hypnum *salebrosum?* Hoffm., Bridel, l. c. vol. ii. p. 477.—Hook. et Arn. Bot. Beech. p. 133. Kotzebue Sound.

275. Hypnum *lutescens*, Hudson, Bridel, vol. ii. p. 465.—Hook. et Arn. in Bot. Beech. p. 133. Kotzebue Sound.

276. Hypnum *rivulare?* Bruch et Schimp. Bryol. Europ., var. foliis minus acutis. Kotzebue Sound.

The specimens are without fruit (male flowers only present), and may possibly be a different species from *H. rivulare*.

277. Hypnum *rugosum*, Hedw., St. Crypt. vol. iv. t. 23 A.—Bridel, l. c. vol. ii. p. 634.—H. *rugulosum*, Hook. et Tayl. Kotzebue Sound.

278. Hypnum *uncinatum*, Hall., Hedw. St. Crypt. vol. iv. t. 25.—Bridel, l. c. vol. ii. p. 629.—Hook. et Tayl. Kotzebue Sound.

Hypnum uncinatum, var. *majus*, Wils. Twice as large as the ordinary form, with the branches few, erect (not pinnate), approaching in aspect to var. *obesum* of Sommerfelt in Herb. Hook. Kotzebue Sound.

279. Hypnum *revolvens*, Swartz, Musc. Suec. p. 38. t. vii. fig. 14.—*H. aduncum*, Hook. et Arn. in Bot. Beech. p. 133. Kotzebue Sound.

This species is distinguished from *H. aduncum* by its monoicous inflorescence, and by the absence of striæ on the leaves.

HEPATICÆ.

280. Marchantia *polymorpha*, Linn., Engl. Bot. t. 1600. From Kotzebue Sound to Cape Lisburne.

LICHENES.

(*Auctore Churchill Babington.*)

281. Evernia *divergens*, Fries, Lich. Europ. p. 21.—*Cornicularia divergens*, Ach. Norton Sound and Kotzebue Sound, growing in dense patches on the ground, mixed with *Vaccinium Vitis-idæa*, Grasses, and with other Lichens, as *Evernia ochroleuca*, *Cetraria cucullata*, *C. Islandica*, and *Cladonia rangiferina*.

The specimens from Western Eskimaux-land agree with the authentic ones gathered in Lapland by Wahlenberg, the original discoverer. No apothecia seem to have been observed. Schærer mentions (Enum. Crit. Lich. Europ. p. 5) having received specimens from Eschscholtz, collected in Kotzebue Sound. The range of this species, so far as is known, is limited to the higher latitudes of the Northern hemisphere. It is found as far south as Newfoundland (lat. 50° N.) in the New World, and ascends to the Arctic circle at Great Bear Lake. In Europe it hardly occurs below latitude 60° N., and it rises to the Arctic circle in Lapland.

282. Evernia *ochroleuca*, Fries, Lich. Europ. p. 22.—*Cornicularia ochroleuca*, Ach. Kotzebue Sound; on the ground with other Lichens. Normal form; barren.

A far more diffused plant than *E. divergens*, occurring in the north of Europe commonly, and found as far south as Spain and Corsica; it is also a native of the Canary Islands and New Zealand.

283. Cetraria *Islandica*, Ach., Meth. Lich. p. 294. Norton Sound; Kotzebue Sound; fertile.

284. Cetraria *cucullata*, Ach., Meth. Lich. p. 293. Norton Sound; Kotzebue Sound; fertile.

In a specimen from Norton Sound the upper part of the thallus is sparingly fringed with black teeth. *C. cucullata* occurs from about latitude 40° N. to the Arctic regions, both in the Old and New World, being found in the Pyrences, the Altai mountains, and the White Mountains, penetrating to Lapland, and having been gathered by Franklin in his first journey to Arctic America. Fries and Schærer mention that it is ordinarily accompanied by *C. nivalis*; as yet, however, the latter plant only has been observed in Britain. I have seen no specimens of either from the Southern hemisphere.

285. Cetraria *glauca*, Ach., var. *substraminea*, C. Babing. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 248.—Thallus ample, lacunose, lobes rounded; colour ochroleucous, but passing into glaucous, here and there suffused with a reddish tint; beneath black, chestnut on the edges. Kotzebue Sound, growing among sticks, Grasses, and *Polytricha*; barren.

The colour, which is the same as that of *Parmelia caperata*, appears to be accidental, for in the less exposed parts of the thallus it inclines to glaucous. The discovery of this species in Kotzebue Sound extends its known range in North America about 10° of latitude. For its geographical distribution, see Hook. fil. Fl. Antarct., and add "Nepal" to the stations there mentioned.

286. Nephroma *polaris*, Ach., Lich. Univ. p. 521. Kotzebue Sound, among Mosses and dead leaves; barren.

Dr. J. D. Hooker (Flora Antarctica, p. 521) has indicated the region which this plant inhabits. Dr. Hooker's plant, however, appears to be distinct; it has, indeed, the ample thallus of *N. polaris*, but becomes deeply lacunose and foveolated; it is much more allied to *N. cellulosa*, Ach., with which I am imperfectly acquainted; that species, however, is much smaller and of a different colour.

287. Peltidea *venosa*, Ach., Lich. Univ. p. 516. Kotzebue Sound; on earth.

288. Peltidea *canina*, Ach., Lich. Univ. p. 517. Norton Sound; Kotzebue Sound, among Mosses, *Vaccinia*, etc.

289. Peltidea *polydactyla*, var. *scutata*, Fries, Lichen. Europ. p. 47, sub *Peltigera*. Kotzebue Sound; with Mosses and leaves of *Dryas octopetala* and *Betula nana*.

I had named this *P. horizontalis* in 'Hooker's Journal of Botany,' not without some hesitation, as the apothecia were inclined to be revolute; on one of the specimens which I have since examined they are most decidedly so. The present form is very different in general aspect from the small *P. scutata* of Eng. Bot. with pulverulent margins; indeed, it seems to differ in nothing material from *P. horizontalis*, except in having its apothecia at length revolute, and erect. Wahlenberg and Acharius, at one time, included it under that species. *See Fries, l. c.*

290. Peltidea *aphthosa*, Ach., Lich. Univ. p. 516. Kotzebue Sound; with *Hypna*, *Sphagna*, etc.

For some good remarks on the distribution of this genus, see Hook. fil. Fl. Antarct., which Mr. B. Seemann's discoveries have somewhat qualified. *P. horizontalis*, I would add, has been found by Drummond in Arctic America. Mr. Seemann finds all the species of this genus fertile.

291. Sticta *pulmonacea*, Ach., Lich. Univ. p. 449. Kotzebue Sound; among Mosses and Willow-leaves; barren.

The specimens are rather small, neatly crisped, and pale ferruginous below; approaching the form called *S. linita*. One of the few Arctic species of this genus; it does not appear to occur in the Antarctic regions, where so many *Stictæ* are found; but it is widely extended over the extra-tropical parts of the Northern hemisphere, and occurs, in an altered form (*S. retigera*, Ach.) in and about the Tropics. It would seem to have attained its southern limit in the Mauritius and Bourbon.

292. Parmelia *saxatilis*, Ach., Meth. Lich. p. 204. Kotzebue Sound; on rocks; barren.

Thallus having isidiophorous processes; lobes short and broad; soredia, on some specimens, blue, confluent.

293. Parmelia *parietina*, Ach., Meth. Lich. p. 213. Kotzebue Sound; scattered over some specimens of the preceding species; barren.

This Lichen is dispersed over the temperate and frigid zones of both hemispheres; in the Antarctic region it has only as yet been found in an imperfect state (*Lecanora citrina*, Ach.). A specimen in my herbarium is marked "Surinam," but there is possibly an error respecting the habitat.

294. Parmelia *pallescens*, var. *Upsaliensis*, Fries, Lich. Europ. p. 132. Kotzebue Sound; on the root of some grassy plant; fertile.

295. Parmelia *tartarea*, var. *frigida*, Fries, Lich. Europ. p. 134. Kotzebue Sound, covering the surface of a Moss, which it has destroyed; fertile.

This and the preceding species are sometimes very difficult to distinguish; one or both of them reappear in the temperate and frigid regions of the south. A barren Lichen from Kotzebue Sound appears to belong to *P. oculata*, Fries (Eng. Bot. t. 1833).

296. Stereocaulon *tomentosum?* Fries, Sched. Crit. vol. iii. p. 20. Kotzebue Sound; growing loosely over masses of *Jungermanniæ*, mingled with Mosses and leaves of *Vaccinia*, also on sandy ground among *Hypna*.

The absence of fruit renders the determination somewhat doubtful in so difficult a genus. *S. tomentosum* affects the more northern and alpine parts of Europe and America, and may probably be found elsewhere, since several species of *Stereocaulon* have a very wide range.

297. Cladonia *gracilis, β hybrida,* Schær. Spicil. p. 32. Kotzebue Sound; mixed with Mosses, *Jungermanniæ,* and *Cladonia rangiferina* and *Cetraria Islandica;* fertile.

The present Lichen, which is widely diffused over the temperate and cold regions of the north, occurs again in New Zealand and Van Diemen's Land, and extends its range to the Falkland Islands. The two following species appear to have a similar distribution.

298. Cladonia *cornucopioides,* Fries, Sched. Crit. vol. iii. p. 19.—*C. coccifera,* Auctt. Kotzebue Sound; very fine, fertile.

299. Cladonia *deformis,* Hoffm., Germ. vol. ii. p. 120. Kotzebue Sound; on rotten wood.

Cups proliferous; apothecia symphycarpous. An allied species has been gathered in a barren state, which seems to be *C. bellidiflora,* Schær., rather than *C. digitata,* Hoffm., to which I had previously referred it with a mark of doubt, judging from a less perfect specimen.

300. Cladonia *uncialis,* Hoffm., Fries, Lich. Europ. p. 244. Kotzebue Sound; mixed with *C. rangiferina* and leaves of *Betulæ;* barren.

The specimens are four or five inches long, of a yellower colour than is usual with the European plant, and much perforated above; perforations are also frequent near the gaping axils. *C. uncialis* recurs in Tasmania, and probably in many other parts of the south.

301. Cladonia *rangiferina,* Hoffm., Germ. vol. ii. p. 114. Norton Sound (var. *sylvatica,* Fries); Kotzebue Sound; mixed with various other plants in both localities.

This Lichen is a perfect cosmopolite; no latitude or climate appears to be adverse to its development.

FUNGI.

302. Dothidea *betulina,* var. *Betulæ-nanæ,* Fries, Syst. Myc. vol. ii. p. 555. Kotzebue Sound.

303. Erineum *roseum,* Schult., Fl. Stug. p. 506. Kotzebue Sound.

ALGÆ.

(*Auctore W. H. Harvey.*)

304. Fucus *vesiculosus,* Linn., Harv. Phyc. Brit. t. 204. Plentiful in Kotzebue Sound.

305. Alaria *esculenta,* Grev., Harv. Phyc. Brit. t. 79. Arctic coast.

306. Chorda *Filum,* Stach., Harv. Phyc. Brit. t. 107. Arctic coast.

307. Dictyosiphon *fœniculaceus,* Grev., Harv. Phyc. Brit. t. 326. Arctic coast.

308. Chætopteris *plumosa,* Kütz., Harv. Phyc. Brit. t. 87. Brought up by the dredge, together with other delicate seaweeds.

309. Odonthalia *dentata,* var. *angusta,* Harv., Phyc. Brit. v. 34. Arctic coast.

310. Rhodomela *larix,* Ag., Turn. Hist. Fuc. t. 207. Arctic Ocean.

311. Delesseria *sinuosa,* Ag., Harv. Phyc. Brit. t. 259. Arctic Ocean.

312. Phyllophora *Brodiæi,* J. Ag., Harv. Phyc. Brit. t. 20. Arctic coast.

A single specimen of the broad-leaved variety.

Mo. Bot. Garden,
1893

313. Ahnfeldtia (Gymnogongrus) *plicata,* J. Ag., Harv. Phyc. Brit. t. 288. Arctic coast.

314. Nostoc *verrucosum?* Fresh-water pools at Port Clarence.

This *Nostoc* may be half-a-dozen of Kützing's species, or he might make it a "new" one; but I have no faith in the specific characters attempted to be laid down.

315. Ulva (Prasiola) *crispa,* Lightf., Hook. Fl. Antarct. vol. ii. p. 498.—Grev. Alg. Brit. p. 175. — *Prasiola crispa,* Kütz. Phyc. Gen. p. 295.—Jessen. Pras. p. 18. t. 1. fig. 10–16. Herald Island.

THE COLLECTIONS OF CAPTAIN W. J. S. PULLEN, R.N., CAPTAIN W. PENNY, AND MR. CHARLES EDE, R.N.

Besides the collection formed during the voyage of H.M.S. Herald, a number of plants were gathered in various parts of the Arctic region by Captain Pullen, Captain Penny, and Mr. Ede; these have been communicated to Sir William Hooker, and lists of them have been prepared by Mr. W. Stevens. Though none, except a few collected by Captain Pullen, belong to the flora of Western Eskimaux-land, I have alluded to them in the foregoing pages, and have no hesitation to annex the lists. I can only regret that the other collections formed during the Arctic Expeditions have not come to hand, so as to enable me to offer some general remarks on them. It will be observed that none of the species enumerated below are new to science, but they are interesting as illustrating the geographical botany of Arctic America. Those of Captain W. Penny and Mr. Ede, being chiefly from countries only discovered within the last few years, are very valuable. The search for Sir John Franklin's expedition being still continued, it is desirable that the officers employed in that search should, as far as circumstances will permit, collect specimens. New genera or species they must scarcely expect to discover, but they can confer a benefit upon science, by noting the exact locality in which the specimens are found. In the higher latitudes every degree is of importance, and it is only by carefully noticing the localities that we shall be able to ascertain the northern limits of the different plants.

PLANTS COLLECTED BY CAPTAIN W. J. S. PULLEN, R.N.

Caltha palustris, L. Fort Simpson to Great Slave Lake.
Caltha arctica, R. Brown. Richard's Isle.
Anemone multifida, Poir. Fort Simpson to Great Slave Lake.
Aconitum Napellus, L. Point Barrow to Mackenzie River.
Aquilegia brevistyla, Hook. Fort Simpson to Great Slave Lake.
Thalictrum dioicum, L. Fort Simpson to Great Slave Lake.
Thalictrum corynellum, De Cand. Fort Simpson to Great Slave Lake.
Actæa rubra, Bigel. Fort Simpson to Great Slave Lake.
Papaver nudicaule, L. Fort Simpson to Great Slave Lake.
Capsella Bursa-pastoris, Mœnch. Fort Simpson to Bear Lake River.
Corydalis glauca, Pursh. Point Barrow to Mackenzie River.

Corydalis aurea, Willd. Fort Simpson to Great Slave Lake.
Draba incana, L., *var.* Garry Isle.
Draba glacialis, Adams. Garry Isle.
Cochlearia oblongifolia, De Cand. Point Barrow to Mackenzie River.
Erysimum cheiranthoides, L. Fort Simpson to Bear Lake River.
Erysimum lanceolatum, R. Brown. Arctic coast.
Braya pilosa, Hook. Coast west of Cape Bathurst.
Parrya macrocarpa, R. Br. Point Barrow to Mackenzie River.
Barbarea vulgaris, R. Br. Fort Simpson to Great Slave Lake.
Arabis hirsuta, Scop. Fort Simpson to Bear Lake River.
Turritis stricta? Grah. Fort Simpson to Great Slave Lake.
Sisymbrium humile, Led., *var.* Mackenzie River to Fort Good Hope.
Sisymbrium canescens, Nutt. Fort Simpson to Bear Lake River.
Sisymbrium sophioides, Fisch. Point Barrow to Mackenzie River.
Nasturtium palustre, De Cand. Point Barrow to Mackenzie River.
Lepidium ruderale, L. Fort Simpson to Bear Lake River.
Cardamine pratensis, L. Point Barrow to Mackenzie River.
Cardamine digitata, Rich. Point Barrow to Mackenzie River.
Silene acaulis, L. Point Barrow to Mackenzie River.
Lychnis apetala, L. Point Barrow to Mackenzie River.
Stellaria longipes, Goldie. Point Barrow to Mackenzie River.
Stellaria longifolia, Muhl. Fort Simpson to Great Slave Lake.
Stellaria media, L. Fort Simpson to Bear Lake River.
Arenaria lateriflora, L. Fort Simpson to Great Slave Lake.
Cerastium Fischerianum, Ser. Arctic coast.
Cerastium maximum, L. Arctic coast, between Point Barrow and Mackenzie River.
Linum perenne, L. Fort Simpson to Bear Lake River.
Parnassia palustris, L. Point Barrow to Bear Lake River.
Phaca astragalina, De Cand. Pelly's Isle; Point Barrow to Bear Lake River.
Oxytropis campestris, De Cand. Garry's Isle; Pelly's Isle.
Oxytropis arctica, R. Br. Arctic coast, west of Cape Bathurst.
Astragalus hypoglottis, L. From Point Barrow to Fort Good Hope.
Phaca glabriuscula, Hook. Fort Simpson to Great Slave Lake.
Lupinus perennis, De Cand. Arctic coast; Fort Good Hope to Point Separation.
Phaca aboriginorum, Hook. Fort Simpson to Great Slave Lake.
Hedysarum boreale, Nutt. Fort Simpson to Bear Lake River.
Hedysarum Mackenzii, Rich. Fort Simpson to Great Slave Lake.
Lathyrus ochroleucus, Hook. Fort Simpson to Great Slave Lake.
Vicia Americana, Muhl. Point Barrow to Great Slave Lake.
Fragaria Virginiana, Sm. Fort Simpson to Great Slave Lake.
Potentilla emarginata, Pursh. Point Barrow to Mackenzie River.
Potentilla fruticosa, L. Fort Good Hope to Point Separation.
Potentilla Norvegica, L. Point Barrow to Great Slave Lake.
Potentilla Vahliana, Lehm. Coast west of Cape Bathurst.

Potentilla nivea, L. Coast west of Cape Bathurst.
Potentilla anserina, L. Point Barrow to Bear Lake River.
Spiræa salicifolia, L. Point Barrow to Mackenzie River.
Rubus Chamæmorus, L. Point Barrow to Mackenzie River.
Rubus arcticus, L. Fort Simpson to Great Slave Lake.
Rubus strigosus, Mich. Fort Simpson to Great Slave Lake.
Rosa cinnamomea, L. Point Barrow to Mackenzie River.
Dryas integrifolia, L. Point Barrow to Mackenzie River; Pelly's Isle.
Amelanchier Canadensis, L. Fort Simpson to Great Slave Lake.
Epilobium angustifolium, L. Point Barrow to Bear Lake River.
Epilobium latifolium, L. Fort Simpson to Bear Lake River.
Ribes lacustre, Pursh. Point Barrow to Mackenzie River.
Saxifraga oppositifolia, L. Point Barrow to Mackenzie River.
Saxifraga cernua, L. Point Barrow to Mackenzie River.
Saxifraga Hirculus, L. Point Barrow to Mackenzie River.
Saxifraga nivalis, L. Nicholson's Isle.
Linnæa borealis, L. Fort Simpson to Bear Lake River.
Viburnum pauciflorum, La Pyle. Fort Simpson to Great Slave Lake.
Cornus stolonifera, Mich. Fort Simpson to Great Slave Lake.
Cornus Canadensis, L. Fort Simpson to Bear Lake River.
Conioselinum Fischeri, Wimm. Arctic coast.
Galium boreale, L. Fort Simpson to Bear Lake River.
Valeriana capitata, Willd. Point Barrow to Mackenzie River.
Aster montanus, Rich. Point Barrow to Bear Lake River.
Aster ramulosus, Lindl., *var.* (*A. falcatus,* Lindl.) Point Barrow to Mackenzie River.
Erigeron acre, L., *var.* Fort Simpson to Bear Lake River.
Erigeron Philadelphicum, Pursh. Fort Simpson to Great Slave Lake.
Erigeron glabellum, Nutt. Point Barrow to Mackenzie River.
Solidago multiradiata, Ait. Fort Good Hope to Point Separation.
Solidago stricta? Ait. Fort Simpson to Bear Lake River.
Artemisia borealis, Pall. Point Barrow to Mackenzie River.
Artemisia Canadensis, Mich. Fort Simpson to Bear Lake River.
Artemisia biennis, L. Fort Simpson to Bear Lake River.
Artemisia vulgaris, L. Point Barrow to Bear Lake River.
Senecio aureus, L. Fort Simpson to Great Slave Lake.
Senecio lugens, Richards. Arctic coast.
Senecio frigidus, Less. Garry Isle; Pelly's Isle.
Senecio palustris, L., *var.* (*S. congestus,* Hook.) Point Barrow to Mackenzie River.
Achillea Millefolium, L. Great Slave Lake.
Pyrethrum inodorum, var. *pumilum,* Cham. et Schlecht. (*P. grandiflorum,* Hook.) Richard's Isle.
Leucanthemum integrifolium, De Cand. Point Barrow to Mackenzie River.
Nardosmia corymbosa, Hook. Point Barrow to Mackenzie River; Richard's Isle.
Nardosmia palmata, Hook. Pelly's Isle.
Saussurea monticola, Richards. Point Barrow to Mackenzie River.

Taraxacum Dens-leonis, Desf. Fort Simpson to Great Slave Lake.
Mulgedium pulchellum, Nutt. Point Barrow to Mackenzie River.
Pleurogyne rotata, L. Point Barrow to Mackenzie River.
Gentiana detonsa, Fries. Point Barrow to Mackenzie River.
Vaccinium Vitis-idæa, L. Fort Simpson to Great Slave Lake.
Vaccinium uliginosum, L. Arctic coast.
Pyrola rotundifolia, L. Richard's Isle; Point Barrow to Great Slave Lake.
Arctostaphylos alpina, Spr. Fort Good Hope to Point Separation.
Arctostaphylos Uva-ursi, L. Point Barrow to Bear Lake River.
Ledum latifolium, Ait. Fort Simpson to Bear Lake River.
Ledum palustre, L. Point Barrow to Mackenzie River; Richard's Isle.
Rhododendron Lapponicum, Wahl. Garry Isle.
Cassiope tetragona, Don. Point Barrow to Mackenzie River; Garry Isle.
Polemonium cæruleum, L. Point Barrow to Mackenzie River.
Polemonium capitatum, Benth. Point Barrow to Mackenzie River.
Phlox Richardsoni, Hook. Coast west of Cape Bathurst.
Androsace Chamæjasme, Wulf. Pelly's Isle.
Androsace septentrionalis, L. Fort Simpson to Great Slave Lake.
Primula Hornemanniana, Lehm. Fort Simpson to Great Slave Lake.
Mertensia maritima, Don. Cape Bathurst.
Mertensia paniculata, De Cand., *var.* Fort Simpson to Great Slave Lake.
Myosotis alpestris, Schmidt. Point Barrow to Mackenzie River.
Lophanthus anisatus, Benth. Fort Simpson to Bear Lake River.
Veronica scutellata, L. Fort Simpson to Bear Lake River.
Castilleja pallida, Kth. Fort Simpson to Bear Lake River.
Castilleja septentrionalis, Lindl. Point Barrow to Mackenzie River; Pelly's Isle.
Pedicularis hirsuta, L. Garry Isle.
Pedicularis Sudetica, Willd. Point Barrow to Mackenzie River.
Pedicularis verticillata, L. Garry Isle.
Pedicularis capitata, Adams. Garry Isle.
Armeria arctica, Wallr. Arctic coast.
Polygonum viviparum, L. Point Barrow to Mackenzie River.
Polygonum Bistorta, L., *var.* Point Barrow to Mackenzie River; Garry Isle.
Plantago lanceolata, L. Fort Simpson to Bear Lake River.
Euphorbia hypericifolia, L. Fort Simpson to Great Slave Lake.
Corispermum hyssopifolium, Stev. Point Barrow to Mackenzie River.
Blitum capitatum, L. Fort Simpson to Bear Lake River.
Chenopodium album, L. Fort Simpson to Bear Lake River.
Shepherdia Canadensis, Nutt. Fort Good Hope to Point Separation.
Empetrum nigrum, L. Richard's Isle.
Betula glandulosa, Mich. Arctic coast, west of Cape Bathurst.
Alnus viridis, De Cand. Point Separation; Mackenzie River.
Salix reticulata, L. Fort Simpson to Bear Lake River, and Pelly's Isle.
Salix retusa, L. Pelly's Isle.

Salix arctica, Pall. Pelly's Isle.
Salix villosa, Don. Point Separation.
Salix speciosa, Hook. et Arn. Fort Simpson to Bear Lake River.
Salix cordata, Willd., *var.* Fort Simpson to Bear Lake River.
Salix cordata, Willd., var. *Mackayana,* Hook. Point Barrow to Great Slave Lake.
Zigadenus chloranthus, Rich. Fort Good Hope to Great Slave Lake.
Smilacina stellata, Pursh. Fort Simpson to Great Slave Lake.
Platanthera obtusata, Lindl. Fort Simpson to Great Slave Lake.
Alopecurus alpinus, Sm. Arctic coast.
Beckmannia eruciformis, Host. Fort Simpson to Bear Lake River.
Dupontia Fischeri, Br. Hutchinson's Bay.
Trisetum subspicatum, Beauv. Point Barrow to Mackenzie River.
Colpodium latifolium, R. Br. Arctic coast.
Poa pratensis, L. Fort Simpson to Great Slave Lake.
Poa nemoralis, L. Fort Simpson to Great Slave Lake.
Poa cæsia, Sw. Fort Simpson to Bear Lake River.
Festuca Richardsoni, Hook. Hutchinson's Bay.
Bromus purgans, L. Fort Simpson to Bear Lake River.
Deyeuxia neglecta, Kth. Arctic coast.
Colpodium pauciflorum, Hook. Arctic coast.
Aira atropurpurea, Wahl. Point Barrow to Mackenzie River.
Elymus mollis, R. Br. Hutchinson's Bay.
Triticum repens, L., *var.* Fort Simpson to Bear Lake River.
Triticum repens, L., var. *purpurascens.* Arctic coast.
Eriophorum capitatum, Host. Point Barrow to Mackenzie River.
Eriophorum polystachyon, L. Hutchinson's Bay.
Carex scirpoides, Mich. Arctic coast.
Elyna spicata, Schrad. Arctic coast.
Carex cæspitosa, L. Arctic coast.
Carex irrigua, Sm. Hutchinson's Bay.
Equisetum arvense, L. Fort Good Hope to Point Separation.

PLANTS COLLECTED BY CAPTAIN WILLIAM PENNY.

Ranunculus frigidus, Willd. Assistance Bay.
Papaver nudicaule, L. Assistance Bay.
Cochlearia fenestralis, Br. Assistance Bay.
Parrya arctica, R. Br. Assistance Bay.
Cardamine bellidifolia, De Cand. Assistance Bay.
Braya glabella, Richardson. Assistance Bay.
Draba rupestris? R. Br. Assistance Bay.
Draba glacialis, Adams, *var.* Assistance Bay.
Draba alpina, L. Assistance Bay.
Arenaria Rossii, R. Br. Assistance Bay.

Arenaria rubella, Hook. Assistance Bay.
Cerastium alpinum, L. Assistance Bay.
Cerastium alpinum, L., var. *glabratum,* Hook. Assistance Bay, and Bushnan Island.
Stellaria longipes, Goldie. Northumberland Inlet and Assistance Bay.
Lychnis apetala, L. Assistance Bay.
Potentilla nana, Lehm. Berry Islands and other islands in Davis Strait.
Dryas integrifolia, L. Assistance Bay, Berry Island, and adjacent islands.
Epilobium latifolium, L. Northumberland Inlet.
Saxifraga pauciflora? Stev. Bushnan Island.
Saxifraga oppositifolia, L. Assistance Bay and Berry Islands.
Saxifraga nivalis, L. Assistance Bay.
Saxifraga cernua, L. Northumberland Inlet and Assistance Bay.
Saxifraga flagellaris, Willd. Assistance Bay.
Saxifraga tricuspidata, De Cand. Northumberland Inlet.
Saxifraga Hirculus, De Cand. Northumberland Inlet.
Pyrola rotundifolia, L. Northumberland Inlet.
Cassiope tetragona, Don. Bushnan Island.
Vaccinium Vitis-idæa, L. Bushnan Island.
Vaccinium uliginosum, L. Northumberland Inlet.
Arctostaphylos alpina, Spr. Northumberland Inlet.
Polygonum viviparum, L. Assistance Bay.
Oxyria reniformis, L. Assistance Bay and Northumberland Inlet.
Empetrum nigrum, L. Northumberland Inlet.
Salix cordifolia, Pursh. Assistance Bay.
Salix arctica, Pall. Assistance Bay and Bushnan Island.
Juncus biglumis, L. Assistance Bay.
Carex Hepburnii, Bootl. Berry Island.
Luzula hyperborea, R. Br. Berry Island, Davis Strait; Bushnan Island.
Eriophorum polystachyon, L. Assistance Bay.
Phippsia monandra, Trin. Assistance Bay.
Alopecurus alpinus, L. Bushnan Island and Assistance Bay.
Poa cenisia, All. Bushnan Island and Assistance Bay.
Hierochloe alpina, Wahl. Bushnan Island.
Luzula hyperborea, Br. Bushnan Island.
Woodsia glabella, Br. Berry Island, and other islands in Davis Strait.

PLANTS COLLECTED BY MR. CHARLES EDE, R.N.

Papaver nudicaule, L. Bushnan Island; Cornwallis Island.
Braya glabella, Rich. Cornwallis Island.
Draba muricella, De Cand. Bushnan Island.
Cochlearia oblongifolia, De Cand.
Lychnis apetala, L. Wolstenholme.
Cerastium alpinum, L. Jaateri.

Stellaria longipes? Goldie. Cornwallis Island.
Silene acaulis, L. Woman Islands.
Saxifraga oppositifolia, L. Kakkidlarn, Greenland; Cornwallis Island.
Saxifraga cernua, De Cand. Ukaari; Cornwallis Island.
Saxifraga cæspitosa, L. Wolstenholme, Greenland; Cornwallis Island.
Saxifraga rivularis, De Cand. Whale Fish Island.
Saxifraga nivalis, L. Cornwallis Island.
Potentilla emarginata? Pursh. Wolstenholme.
Diapensia Lapponica, L. Whale Fish Island.
Pyrola rotundifolia, L. Whale Fish Island.
Cassiope tetragona, Don. Ichsuti.
Vaccinium uliginosum, L.
Loiseleuria procumbens, L. Whale Fish Island.
Empetrum nigrum, L. Whale Fish Island.
Polygonum viviparum, L. Bushnan Island.
Oxyria reniformis, L. Whale Fish Island.
Eriophorum capitatum, Host.
Alopecurus alpinus, Sm. Ibgi.
Woodsia ilvensis, R. Br. Whale Fish Island.
Lycopodium Selago, L. Küedmoosi.

ERRATUM.

Page 34.—No. 125. ARTEMISIA *androsacea,* line 4, *for* corolla glaberrima, *read* corolla glaberrima vel minute glandulosa.

FLORA

OF THE

ISTHMUS OF PANAMA.

MAP OF THE ISTHMUS OF PANAMA.

Territory of Bocas del Toro.
Territory of Darien.
Province of Veraguas.
Province of Panama.

ATLANTIC OCEAN
PACIFIC OCEAN
MOSQUITIA
COSTA RICA
TERRITORY OF BOCAS DEL TORO
PROVINCE OF VERAGUAS
PROVINCE OF PANAMA
TERRITORY OF DARIEN
BAY OF PANAMA
GULF OF DARIEN OR URABA
CARTHAGENA
COIBA
I. Secos
I. Ladrones
Montuoso
Burica P.
Punta Mala
P. Mariato
P. Marzo
Manzanillo
Portobelo
P. San Blas
Chagres
Panama
Taboga
Chame
P. Chame
Chiman
Piñas Bay
Piñas I.
Mosquito P.
Garachine P.
Cupica
Quemado
S. P. Solano
Navita
Chirambira
Rio S. Juan
Choco
Citara
Rio Atrato
Rio Tuyra
Rio Chucunaque
Rio Tuyra
Rio Tuyra

83 82 81 80 79 78 77 76
9 8 7 6 5 4

P. Reeve, sculp.

FLORA

OF THE

ISTHMUS OF PANAMA.

HISTORICAL NOTICE.

When Columbus had dispelled the mist of ignorance and superstition which had hung over the waters of the Atlantic Ocean, and had ascertained the existence of a Western Continent, a number of navigators steered for the New World. One of the most prominent among them was Rodrigo de Bastidas, the discoverer of the country now termed the Isthmus of Panama. Bastidas left Cadiz in 1500, and having reached the mainland of America, he entered the Gulf of Uraba, and traced the shores of Darien as far as the port of Retrete, everywhere collecting natural curiosities, dyewoods, and other articles of commerce. Though most of the West Indian Islands and the coast from the southern parts of Brazil to the port of Retrete were now known, Columbus still entertained the opinion that by sailing westward a passage to the East Indies would be found. In the hope of effecting this communication he commenced his fourth voyage, May 19th, 1502, and making for the mainland, discovered the coast between Cape Gracias a Dios and the harbour when the explorations of Bastidas had terminated. A landing was effected in various places of Veraguas, and so delighted was Columbus with the luxuriance of the vegetation and the mineral wealth, that he determined to leave a colony on the banks of the river Belen. The parties sent into the interior met with plenty of gold, and found the cultivation of Indian corn carried on to some extent, pine-apples growing on the roadsides, and palms furnishing a delicious wine; all confirmed the richness of the country. The brilliant results, however, expected from the establishment of a colony, were not realized. The Indians, finding that the white men were going to take up a permanent abode, rose in defence of their liberty, and compelled the Spaniards to abandon their plans. Some time elapsed before the country was again visited. In 1510,

however, two expeditions arrived, one of which having formed the settlement of Santa Maria el Antigua del Darien, the territory was explored in all directions, and as early as 1513 Vasco Nuñez de Balboa succeeded in crossing the Isthmus and proving the existence of a southern ocean. After a lapse of some years Francisco Pizarro, and two associates, planned an expedition for conquering Peru. The scheme was successful; the remaining portion of the coast was traced, and the country thus clearly defined.

Spain jealously excluded foreigners from her colonies, and treated intruders with the utmost severity. All knowledge which could tend to familiarize other nations with these territories was withheld, and the rest of Europe was almost ignorant of the regions conquered. But this policy met with the retribution it deserved, calling into existence that formidable association the Buccaneers, who, by making constant inroads into the Spanish territories, became as familiar with most parts as they were with their own country. The Buccaneers did not all belong to the mere scum of society; among them were men of the highest acquirements. Lionel Wafer, for instance, published the first account of Darien, Dampier furnished some valuable notes on the climate and fruits of Panama, and another of the rovers described, amongst other interesting objects, the Cedron, a tree, the virtues of which have only lately become more generally known. After the suppression of the Buccaneers a Scottish colony was formed on the northern coast of Darien. Unfortunately this establishment, important as it might have proved by affording information of a country so little explored, was soon given up; and from that period (1700) until the end of the last century no publications appeared relative to the Isthmus. It must not, however, be supposed that the Spaniards themselves were ignorant of the countries over which their rule extended. Men of eminence were frequently sent to draw up reports on the resources of the colonies; and it was to one of these expeditions that Thaddeus Hænke, a Bohemian, was attached as Botanist. Hænke arrived at the city of Panama towards the end of 1790, and though his stay was short, he formed considerable collections, a part of which was made known by Presl, under the title of 'Reliquiæ Hænkeanæ.'

From the first, Spain had laid down the maxim that learning did not become Creoles. Everything that could elevate the mind was prohibited. A printing-press was a privilege only granted to three of the Vice-royalties; the study of chemistry was not permitted, and the works of the celebrated Mutis, though purely botanical, were not allowed to be published. This course was pursued through several centuries; at last came the Revolution,—the heroic struggle,—the independence. All obstacles impeding the progress of science were cleared away, and encouragement was given to every branch of learning. Naturalists were allowed to explore the countries in every direction, and the Republican governments, whatever may have been their faults, always showed themselves willing to aid scientific men in their pursuits; a striking contrast, indeed, to the conduct of the Spanish administration.

One of the first to take advantage of the change was Hugh Cuming, an Englishman. Having, during a residence in Valparaiso, become the owner of a vessel, and possessing a

predilection for Natural History, he conceived the plan of combining with a trading voyage the exploration of tropical countries. Leaving Chili, he touched at various ports of Ecuador, and reached Panama roads in 1829, towards the close of the dry season. He visited Taboga, the Pearl Islands, the neighbourhood of Panama, the Bay of Montijo, and the river Chiriqui, everywhere pursuing the object of his voyage. On his return to England some of his collections passed into the hands of Sir William Hooker and other eminent naturalists; a list of the *Orchideæ* was published by Dr. Lindley, in the first volume of the 'Journal of Botany.' The Flora was next investigated by George Barclay, who was attached to H.M.S. Sulphur, and during the years 1837, 38, and 39, explored the Bay of Panama, Coyba, and Veraguas. The surgeon of the Expedition, Brinsley Hinds, also gathered botanical specimens, and it was chiefly his materials which formed the basis of Bentham's 'Botany of H.M.S. Sulphur,' a work which has obtained a well-merited celebrity. Towards the end of 1843 William Lobb, from the nursery of Messrs. Veitch, at Exeter, spent some months in the neighbourhood of Panama and the river Chagres.

During portions of the years 1846, 47, 48, and 49, the author made journeys into the interior of Veraguas, Panama, and Darien, visiting the whole coast of the Pacific side of the Isthmus, and passing districts which had never been trodden by any botanist. Several of his plants have been figured and described by Sir William J. Hooker in the 'Botanical Magazine' and the 'Journal of Botany.' Towards the latter part of 1848, J. Warszewiez, a native of Poland, paid a visit to Panama and Veraguas, where he collected a great many, chiefly living, plants. In 1850 A. Fendler, the enterprising traveller who has done so much towards extending our knowledge of New Mexico, staid some time at Chagres, and brought together a very extensive herbarium. In the following year, 1851, J. Warszewiez made another journey to Veraguas.

Such is a sketch of the history of those who, during the course of three centuries and a half, have laboured to explore the Isthmus of Panama. The little that has been achieved shows that it is not from the investigation of visitors, however learned or zealous they may be, that a more perfect knowledge must be expected. Where Nature is so grand, so manifold in her forms, nothing save a steady course of inquiry carried on by those residing in the country can lead to a satisfactory end. Fortunately, in several parts of South America there are springing up men eagerly devoted to Natural History, and so great is the intellectual progress which has been made since the Independence, that the time does not seem distant when the inhabitants will turn from the active scenes of civil strife, to the pacific regions of the Vegetable Kingdom.

INTRODUCTION.

THE Isthmus of Panama, that part of New Granada which, like a bridge, connects the two great continents of America, their Flora, Fauna, and races, lies between the fourth and tenth parallels of north latitude and the seventy-seventh and eighty-third of west longitude. It comprises the districts of Panama, Veraguas, Darien, and Boca del Toro, and is in its narrowest part only twenty-seven miles across. Bounded on the north and north-east by the Caribean Sea, on the south and south-west by the Pacific Ocean, on the east by the rivers Atrato and San Juan, and on the west by Mosquitia and Costarica, it presents the configuration of a bow, and an extent of surface, including the islands, of 34,700 square miles, an area nearly equal to that of Portugal.

The adjacent oceans are happily free from the visitations of those fearful tempests which render the seas of China and both Indies so dangerous. But they are favourable to the formation of waterspouts. A cloud is seen rising, the wind shifts into another quarter, and navigators behold a tubular body of water with a gyratory motion from right to left, the same direction as that of the hurricanes of the northern hemisphere. Excitement prevails on board: the sails are trimmed, the helm is put down, all means are used to escape. However, at times before the preventive measures can be completed the waterspout is near; it comes closer and closer, till at last it overwhelms all, the sails, the ship, the men. Directly the phenomenon is past, the wind returns to the former quarter, and everything assumes its usual aspect*. The water seldom loses its glassy smoothness. During the rainy season, when calms and light winds mostly prevail, it often looks like an inland lake. Pelicans are seen in great numbers, some fishing, others quietly sitting on the surface, their large bills giving them a grave, almost dignified, appearance. Now and then, as a boat passes, yellow water-snakes will suddenly erect their heads, and show their fangs with an angry hissing, as if to chide their disturbers; occasionally shoals of grampus enliven the scene, splashing, leaping, and hunting dexterously.

* The ships of Columbus, when on the coast of Veraguas, were often endangered by waterspouts; the Pandora, the tender of the Herald, was struck by one near Punta Mala.

The coast is fringed with islands. The largest on the Atlantic side are the Escudo de Veraguas, and those situated in the Lagoon of Chiriqui; various others of smaller size, known to voyagers by the name of Cayos, or Keys, are scattered along the shores, but all are thinly inhabited and little frequented. Of greater importance and more populous are the islands on the opposite coast. Several groups, the Secos, Paredes, Ladrones, and Contreras, lie off Veraguas; another cluster, of which Coyba, Gobernadora, and Cebaco are the largest, exists near the Bay of Montijo; a little Archipelago, the Pearl Islands, also known by the synonyms of Islas del Rey, Islas del Istmo, and Islas de Colombia, valuable from the number of pearls collected there, is situated at the entrance of the Bay of Panama; while the Taboga group, in the neighbourhood of Panama, though smaller, is, on account of its position and high cultivation, not less important. Some of the islands are truly enchanting. The habitations, having probably been pitched on a fine sandy beach strewed with shells, are almost hidden by groves of tamarinds, plantains, and oranges. Wild vines and Passion-flowers cover the roofs; Calabash-trees show their large pumpkin-like fruit, and white, purple, and yellow Plumierias diffuse a delightful odour; the whole contrasting charmingly with the sombre hues of the primeval forest, and the light green of the savanas.

The Isthmus is not distinguished for high mountains. The mighty chain of the Andes, after traversing the continent of South America, decreases when approaching this narrow neck of land, and in the province of Panama is hardly recognizable in a ridge of hills seldom exceeding 1000 feet in height. On entering Veraguas the Cordillera attain a greater elevation, and in the volcano of Chiriqui present the most elevated part of the Isthmus, a peak 7000 feet high. The ridge is covered with forests, and is chiefly confined to the central and northern districts. The coast of the Pacific Ocean, especially the Cantons of Nata, Santiago, and Alanje, abounds in grassy plains, or savanas, of great extent, which by affording pasture to numerous herds of cattle constitute the principal riches of the country. Volcanoes, all now extinct, rise in different parts. The highest is the Chiriqui; another, about 3000 feet in elevation, called the Janano, is at Cape Corrientes in Darien, and several others are reported to exist in Veraguas; even the island of Taboga has been considered as a portion of a crater. But, though destitute of active volcanoes, the Isthmus by no means enjoys an immunity from earthquakes. Some rather severe shocks, coming from the west, and having apparently their origin in Central America, are now and then experienced, especially during the dry season. But they do not seem to exercise any baneful influence on the vegetation, as is the case in Peru, where, after severe shocks, corn-fields have been known to wither.

With the exception of the higher mountains, where the temperature is comparatively low, the climate is hot and rainy. The seasons are distributed into wet and dry. The rains commence with the appearance of the new moon in April, and are in the beginning mere passing showers, but they gradually increase, and are fully established towards the end of May, when they fall in torrents, sometimes for days together in succession, and are accompanied by thunder and lightning of the most terrific description. Save a few days about

the 24th of June, the Veranito de San Juan, the rains continue for eight months, until the end of December, and in Southern Darien and some parts on the Atlantic side they last almost the whole year. During this time fogs, calms, and light variable winds prevail, and the air is loaded with so much moisture that leather cleaned in the morning is densely covered with mould in the evening. The temperature does not vary more than from 75° to 87° Fahr., but still perspiration being impeded, the temperature feels hot and close, and to a European some of the nights are almost insufferable. Tired in the extreme, he throws himself on his couch, but no sleep closes his eyes. Everything is hot and uncomfortable, and the pillow is repeatedly turned over to get the coolest side. In the Arctic regions the traveller, having only a limited supply of food, and labouring under great bodily privations, is constantly dreaming about gorgeous feasts and tables covered with delightful viands; in tropical countries, when suffering from heat and languor, he is involuntarily reminded of refreshing breezes, frosty mornings, and the cool bed that used to receive his weary limbs.

Towards the end of December the violent rains diminish in frequency, and with the commencement of the new year the north-west wind sets in. An immediate change follows. The air becomes pure and refreshing, the sky blue and serene, hardly a cloud is to be seen, and there being but little moisture in the atmosphere, the heat, though ranging between 75° and 94° Fahr., is less felt. Scarcely has dawn commenced when everybody is in action. Nature stands invigorated by night's repose, and heavy drops of dew hang on every leaf. Stately palms wave their foliage in the morning air, and gay-coloured humming-birds, parrots, and macaws diffuse animation over the scene. This time is delightful, but of short duration. Towards nine o'clock the heat begins to be felt, and that lassitude for which tropical regions are so well known seizes everything. The leaves droop, the wild pigeons cease to utter their notes, and the inhabitants seek shelter in the shade of their dwellings. At noon a profound silence prevails, only broken now and then by some reptile gliding among the dead leaves of the forest, or by the solitary tapping of the woodpecker. Not a breath stirs the air, the whole atmosphere trembles from the excessive heat, and the thermometer of Fahrenheit, when exposed to the full influence of the scorching rays, frequently rises to the height of 124 degrees. In the afternoon the heat becomes less oppressive, breezes spring up, and the cool air of the evening calls forth a new life. The forests are now glittering with myriads of fireflies, crickets are chanting their merry tunes, and here and there are groups of people chatting and amusing themselves. But nothing can exceed the beauty of the scene when the full moon rises, shedding its silvery light over the broad foliage of the tropics. Whatever may have been the fatigue of the day, whatever the body may have suffered from heat and languor, all is forgotten when this spectacle presents itself. Such a night baffles description, it is the quintessence of equinoctial life.

A country so much visited by heavy rains naturally abounds in rivers; their number cannot fall short of 200, and during the wet season not a mile of land can be traversed without crossing at least five or six periodical streams. Most of the rivers have deltas,

which, in many instances, assume the appearance of islands. Their vegetation is a curious mixture of littoral and inland plants, and often presents species from the higher mountains, by which the remote sources of the water may be traced. Of those rivers emptying themselves into the Pacific Ocean, the San Juan, Churchunque, Bayano, Rio Grande de Nata, Santamaria, Tavasara, and Chiriqui, are the largest; of those flowing into the Atlantic, the Belen, Veraguas, Chagres, and the nine-mouthed Atrato. Nowhere is the vegetation more luxuriant than on the banks of these rivers. Wild fig-trees form great bowers over the bed, evergreen Pithecolobiums emit a delicious perfume, Bamboos, the most gigantic of grasses, show their feathery tops, groves of vegetable ivory palms display their foliage; to whatever spot the eye is directed it meets fresh beauties, new charms. The canoe is pushed for miles along the silent forests, where only pumas, jaguars, and monkeys have taken up their abode. Suddenly, the sylvan scene is interrupted by a cleared piece of ground, a few huts. The roaring lion, the huge Baobab-tree, may help to give to the story of the traveller a romantic colouring, but they will never awaken those emotions which the sight of man, accompanied by his domestic animals and useful plants, is calculated to create. They have been coupled together from time immemorial, and vainly has it been attempted to discover the native country of the cerealia, and the most important esculent roots and domestic animals, or to find out the time when they began to be nursed. All that learning, research, and ingenuity have been enabled to effect is to have traced down their history to that remote period when gods and men lived on familiar terms with each other; their origin, like that of our race, is wrapped in that mystery which seems to be a fit curtain for screening those things which were never intended for the human understanding.

The aspect of the flora is much more diversified than the uniformity of the climate and the surface of the country would lead one to expect. The sea-coast and those parts influenced by the tides and the immediate evaporation of the sea, produce a quite peculiar vegetation, which is generally characterized by a leathery glossy foliage, and leaves with entire margins. In all muddy places, down to the verge of the ocean, are impenetrable thickets, formed of Mangroves, chiefly Rhizophoras and Avicennias, which exhale putrid miasmata and spread sickness over the adjacent districts. Occasionally extensive tracts are covered with the Guagara de puerco (*Acrostichum aureum*, Linn.), its fronds being as much as ten feet high. Myriads of mosquitoes and sand-flies fill the air; huge alligators sun themselves on the slimy banks, lying motionless, blinking with their great eyes, and jumping into the water directly any one approaches. To destroy these dreaded swamps is almost impossible: the Avicennias, with their asparagus-like rhizomata, send up innumerable young shoots whenever the main stem is felled; the Rhizophoras extend in all directions their long aerial roots, which soon reach the ground and preserve the trees from falling, after their terrestrial roots have lifted them high above the original level. At Panama, where the tide rises to the height of twenty-two feet, these trees are frequently under water,

the heavy surf washing their tops, apparently without injuring or checking their growth; indeed, so well has nature provided for them, that the seed of the Rhizophoras begins to germinate while the fruit is yet attached to the tree, and it is not until it has sprouted out to the length of some inches that it drops, as a young plant, into the mud below. Rivers, as far as they are subjected to the influence of the ebb and flow, are full of Mangroves, and the highest Rhizophoras, which, growing always on that side where there is the deepest water, assist the natives in conducting their canoes through the mud-banks. On the sand of the sea-beach the *Ipomæa pescapræ* grows in wild luxuriance, producing runners often more than two hundred feet long. Higher up, where the ground is firmer, are groves of Cocoa-nut Palms, poisonous Manzanillo-trees, and spiny Prosopises and Pitajayas, or thickets of *Crescentia cucurbitina* and *Paritium tiliaceum*.

Far different is the vegetation of the savanas. The ground, being level or slightly undulated, is clothed during the greater part of the year with a turf of brilliant green. Groups of trees and bushes rise here and there; silvery streams, herds of cattle and deer, and the isolated huts of the natives, tend to give variety to the scene, while the absence of Palms and Tree-ferns imparts to the whole more the appearance of a European park than a tract of land in tropical America. The turf is almost as dense as in an English garden, and contains, besides numerous kinds of grasses, many elegant *Papilionaceæ*, *Polygaleæ*, *Gentianeæ*, and *Violaceæ*; the sensitive plant (*Mimosa pudica*, Linn.) prevails in many localities, shutting up its tender leaves even upon the approach of a heavy footstep. The clumps of trees and shrubs, over which the Garumos and Pavas are waving their large foliage, are composed of *Myrtaceæ*, *Melastomeæ*, *Chrysobalaneæ*, *Papilionaceæ*, *Verbenaceæ*, *Compositæ*, *Dilleniaceæ*, *Anonaceæ*, *Malpighiaceæ*, and *Acanthaceæ*, and overspread by *Convolvulaceæ*, *Aristolochiæ*, *Apocyneæ*, and other climbing or twining plants. *Orchideæ* are plentiful in the vicinity of the rivers, where the trees are literally loaded with them. The Vainilla (*Vanilla* sp.) climbs in abundance up the stems of young trees, and often increases so much in weight as to cause the downfall of its supporters. The Chumicales, or groves of Sand-paper-trees (*Curatella Americana*, Linn.), form curious features in the landscape. They extend over whole districts, and their presence indicates a soil impregnated with iron. The trees are about forty feet high, have crooked branches—an approximation to the twining habit of the tribe, and their paper-like leaves, if stirred by the wind, occasion a rattling noise, which strongly reminds one of the European autumn, when northerly breezes strip the trees of their foliage.

Forests cover at least two-thirds of the whole territory. The high trees, the dense foliage, and the numerous climbing and twining plants, almost shut out the rays of the sun, causing a gloom, which is the more insupportable as all other objects are hidden from view. Rain is so frequent, and the moisture so great, that the burning of these forests is impossible; a striking difference to those of the temperate regions, where a fire often consumes extensive woods in a very short space of time. Flowers are scarce in proportion to the mass of leaves

with which the places are crowded, and in no respect is the European more disappointed; from cultivating in his gardens none save the choicest and most brilliant flowers which the regions of the sun are capable of producing; from seeing on the stage tropical scenery, which looks more like a representation of fairy-land than of sublunar places; and from reading those highly-coloured accounts with which many travellers have endeavoured to embellish their narratives, his imagination has drawn a picture of equinoctial countries which a comparison with nature at once demolishes. The Espave (*Anacardium Rhinocarpus*, DC.) and the Corotu (*Enterolobium Timboüva*, Mart.) are amongst the most gigantic trees, attaining a height of from 90 to 130 feet, and a circumference of from 24 to 30 feet; and no better estimate can be formed of their size, than by an inspection of the port of Panama, where vessels of twelve tons burden, made of a single trunk, are riding at anchor. The forests occasionally consist of only a single species of tree; but generally they are composed of different kinds, the principal forms belonging to *Sterculiaceæ*, *Tiliaceæ*, *Mimoseæ*, *Papilionaceæ*, *Euphorbiaceæ*, *Anacardiaceæ*, *Rubiaceæ*, *Myrtaceæ*, and *Melastomeæ;* these, and the prevalence of Palms, Tree-ferns, *Scitamineæ*, and *Aroideæ*, stamp on them the real tropical character.

Mountains, exceeding 2000 feet in elevation, situated principally in Western Veraguas, possess a vegetation which resembles in many respects that of the Mexican highlands; one in which the forms of the torrid region are harmoniously blended with those of the temperate. Alders and Blackberries are found with Fuchsias and Salvias; the Brake grows in company with Lupines and Ageratums; Oaks and Palms are intermingled; fine large flowers are abundant. The genera represented are *Styrax*, *Rondeletia*, *Salvia*, *Lopezia*, *Fuchsia*, *Centradenia*, *Ageratum*, *Conostegia*, *Lupinus*, *Hypericum*, *Freziera*, *Galium*, *Smilax*, *Euphorbia*, *Rhopala*, *Equisetum*, *Clematis*, *Chorisia*, *Verbena*, *Condaminea*, *Inga*, *Solanum*, etc. The Oaks, like most tropical ones, are scarcely higher than thirty feet, resembling neither in size nor in grandeur those which our heathen forefathers worshipped; their branches are smooth and devoid of that rugged appearance which renders those of the northern species so picturesque.

The Isthmus is rich in medicinal plants, many of which are known only to the natives, who have ably availed themselves of their properties. As febrifuges, they employ *Chicoria* (*Elephantopus spicatus*, Juss.), *Corpachi* (*Croton*), *Guavito amargo* (*Quassia amara*, Linn.), *Cedron* (*Simaba Cedron*, Planch.), and several *Gentianeæ*, herbaceous plants, which are known by the name of *Canchalaguas*. As purgatives are used, *Niño muerto*, or *Malcasada* (*Asclepias Curassavica*, Linn.), *Frijolillo* (*Cassia occidentalis*, Linn.), *Cañafistola de purgar* (*Cassia Fistula*, Linn.), *Laureño* (*Cassia alata*, Linn.), *Javilla* (*Hura crepitans*, Linn.), and *Coquillo* (*Jatropha Curcas*, Linn.). Emetics are obtained from *Garriba de peña* (*Begonia* sp.) and *Frailecillo* (*Jatropha gossypifolia*, Linn.). As vulneraries they use *Chiriqui* (*Trixis frutescens*, P. Br.), and *Guazimillo*, or *Palo del soldado* (*Waltheria glomerata*, Presl), and *Cope chico de suelo* (*Clusia* sp.). Anti-syphilitics are, *Cardo santo* (*Argemone Mexicana*,

Linn.), *Zarzaparilla* (*Smilax* sp. pl.), and *Cabeza del negro* (*Dioscorea* sp.). Cooling draughts are prepared from the Ferns, *Calahuala* (*Goniophlebium attenuatum*, Presl) and *Doradilla de palo* (*Goniophlebium incanum*, Swartz). Antidotes for the bites of snakes are found in the stem and leaves of the *Guaco* (*Mikania Guaco*, H. B. K.) and the seeds of the *Cedron* (*Simaba Cedron*, Planch.). Cutaneous diseases are cured by applying the bark of the *Palo de buba* (*Jacaranda filicifolia*, Don) and *Nanci* (*Byrsonima cotinifolia*, H. B. K.), and the leaves of the *Malva* (*Malachra capitata*, Linn.).

The most dreaded of the poisonous plants are the *Amancay* (*Thevetia neriifolia*, Juss.), *Cojon del gato* (*Thevetia nitida*, De Cand.), *Manzanillo de playa* (*Hippomane Mancinella*, Linn.), *Florispondio* (*Datura sanguinea*, Ruiz et Pav.), and *Bala* (*Gliricidia maculata*, Kunth). It is said of the *Manzanillo de playa* that persons have died from sleeping beneath its shade; and that its milky juice raises blisters on the skin, which are difficult to heal. The first of these statements must be regarded as fabulous, and the second be received with a degree of modification. Some people will bear the juice upon the surface of the body without being in the least affected by it, while others do experience the utmost pain; the difference seeming to depend entirely upon a man's constitution. Great caution, however, is required in protecting the eyes, for if the least drop enters them, loss of sight and the most acute smarting for several days are the consequence. The smoke arising from the wood produces a similar effect. While surveying on the coast of Darien, a boat's crew of H.M.S. Herald was blinded for some days from having kindled a fire with the branches of this tree. Whenever the natives are affected by the poison, they at once wash the injured part in salt water. This remedy is most efficacious, and, as the *Manzanillo* is always confined to the edge of the ocean, of easy application. It has been stated that the Indians of the Isthmus dip their arrows in the juice of the *Manzanillo*. There are, however, various reasons for doubting this assertion; first, because the poison is, like that of all *Euphorbiaceæ*, extremely volatile, and, however virulent when first procured, soon loses its power; secondly, because its effect, even when fresh, is by no means so strong as to cause the death of human beings, not even producing, as has been stated, the slightest injury on some constitutions. The statement may therefore be considered as an inaccuracy, and it may rather be supposed that the Indians, like those of Guiana, obtain their poison from the two species of *Strychnos* common throughout Panama and Darien. The fruit of the *Amancay* (*Thevetia neriifolia*, Juss.) is also considered very poisonous, but its dangerous qualities have probably been overrated. There is a gentleman in Panama who, when a boy, ate four of these fruits, without experiencing any other effect than mere griping. The leaves of the *Bala*, or, as it is also called, *Madera negra* (*Gliricidia maculata*, Kth.), are used to poison rats. The *Florispondio* (*Datura sanguinea*, Ruiz et Pav.) appears to have always played, and still continues to play, a prominent part in the superstition of tropical America. The Indians of Darien, as well as those of Chocò, prepare from its seeds a decoction, which is given to their children to produce a state of excitement in which they are supposed to possess the power

of discovering gold. In any place where the unhappy patients happen to fall down, digging is commenced; and, as the soil nearly everywhere abounds with gold-dust, an amount of more or less value is obtained. In order to counteract the bad effect of the poison, some sour *Chicha de Maiz*, a beer made of Indian corn, is administered.

Many indigenous plants bear eatable fruits, some of most delicious flavour. The principal are: *Algarrobo* (*Hymenæa Coubaril*, Linn.), *Boca vieja* (*Posoqueria longiflora*, Aubl.), *Cañafistola* (*Cassia Brasiliana*, Lam.), *Cerezo* (*Bunchosia glauca*, H. B. K.), *Coco* (*Cocos nucifera*, Linn.), *Coronillo* (*Bellucia Aubletii*, Naud.), *Espavè* (*Anacardium Rhinocarpus*, De Cand.), *Fruta de Pava* (*Ardisia coriacea*, Swartz), *Granadilla* (*Passiflora quadrangularis*, Linn.), *Guayavo de savana* (*Psidium polycarpon*, Lamb.), *Guayavo* (*Psidium pyriferum*, Linn.), *Guavo* (*Inga*), *Icaco* (*Chrysobalanus Icaco*, Linn.), *Jagua* (*Genipa*), *Jobito de puerco* (*Spondias spinosa*, Seem.), *Marañon* (*Anacardium occidentale*, Linn.), *Madroño de comer* (*Alibertia edulis*, Rich.), *Membrillo* (*Gustavia*), *Nance* (*Byrsonima cotinifolia*, H. B. K.), *Nispero* (*Sapota Achras*, Mill.), *Panama* (*Sterculia Carthaginensis*, Cav.), *Papayo cimarron* (*Carica* sp.), *Piña* (*Ananassa sativa*, Lindl.), *Pita de zapateros* (*Bromelia* sp.), *Sastra* (a *Guttifera*), *Tinajita* (*Pentagonia Tinajita*, Seem.), and *Zarzamora* (*Rubus* sp. pl.)*.

Several spontaneous productions are used as culinary vegetables. The *Marathrum fœniculaceum*, H. B. K., a plant resembling some of the finer sea-weeds, and growing in most rivers of Veraguas, is esteemed so highly by the inhabitants that they have called it *Passe-carne*, i. e., excels or surpasses meat; and, indeed, its young leaf-stalks, when boiled, have a delicate flavour, not unlike that of French beans. The leaves of the *Ñaju de espina* (*Peirescia Bleo*, De Cand.) are eaten as salad, either raw or boiled, like the young branches of several *Opuntias* in Mexico; and in a country where, from the nature of the climate, the rearing of lettuces is attended with difficulty, they form a tolerable substitute. The foliage of the *Col de Nicaragua* (*Jatropha multifida*, Linn.) affords another culinary vegetable, losing, apparently, as do most *Euphorbiaceæ*, its poisonous qualities by boiling. The seeds of the *Chigua* (*Zamia Chigua*, Seem.), a plant abounding in the vicinity of Chirambirà, after having been boiled and reduced to a mash, are mixed with milk and sugar, and thus eaten. A kind of bread is also prepared from them. As condiments for esculent purposes, divers plants are used. The red berries of the *Malagueto chico*, or *Malagueto hembra* (*Xylopia frutescens*, Aubl.), are substituted for pepper, especially by the negroes. The fruit of the *Vainilla* (*Vanilla* sp.) and *Vainilla chica* (*Sobralia* sp.) are spices employed in flavouring sweetmeats, chocolate, and puddings. The leaves of the *Toronjil* (*Ocimum*), a common herb, are chopped, and serve to replace our Parsley. The most important, however, of all the aromatics to the Panamian cook is the *Culantra* (*Eryngium fœtidum*, Linn.). It imparts a flavour difficult for a foreigner to relish; but the inhabitants consider it indispensable, and are quite distressed when in the soups and sancoches their favourite condiment has by some accident been omitted.

* With a few exceptions, the Spanish names, when ending in *o*, denote the tree, in *a*, its fruit.

Excellent timber for building, and wood for cabinet-makers' purposes, abound. Particular notice is due to the *Acabù* (*Xanthoxylum spinosum*, Swartz), *Algarrobo* (*Hymenæa Courbaril*, Linn.), *Amarillo* (*Xanthoxylum* sp.), *Carbonero* (*Lindackeria laurina*, Presl), *Cedro cebolla* (a tree botanically unknown), *Cedro espinoso* (*Pachira Fendleri*, Seem.), *Caoba* (*Swietenia Mahagoni*, Linn.?), *Espavè* (*Anacardium Rhinocarpus*, DC.), *Guachapali* (a *Leguminosa*), *Guavito cansaboca* (*Pithecolobium*), *Guayacan* (*Tecoma Guayacan*, Seem.), *Guazimo colorado* (*Lühea rufescens*, St. Hil.), *Laurel* (*Cordia Gerascanthus*, Jacq.), *Macano* (*Diphysa Carthaginensis*, Jacq.), *Maria* (a *Guttifera*), *Nance* (*Byrsonima cotinifolia*, H.B.K.), *Naranjo de monte* (*Swartzia triphylla*, Willd.), *Nispero* (*Sapota Achras*, Mill.), *Peronil* (*Ormosia Panamensis*, Bth.), *Quira* (*Platymiscium polystachyum*, Bth.), *Roble* (*Tecoma pentaphylla*, Jacq.), *Terciopelo* (*Sloanea quadrivalvis*, Seem.), and *Corotù* (*Enterolobium Timboüva*, Mart.). From the *Roble* and *Guayacan* the most durable wood is obtained. The *Nazareno*, a beautiful bluish fancy wood, the produce of a scientifically unknown tree, would fetch a high price in Europe. The *Quira* is remarkable for its black and brown streaks. The *Corotù* and *Espavè* supply the natives with materials for canoes.

Dyes the country produces several: a yellow one is obtained from the wood of the *Macano* (*Diphysa Carthaginensis*, Jacq.), a scarlet from the leaves of the *Hojita de teñir* (*Lundia Chica*, Seem.), a blue from the foliage of the *Añil silvestre* (*Indigofera Anil*, Linn.), a violet from the fruit of the *Jagua* (*Genipa*), a red from the pulp of the *Bija* or *Achotte* (*Bixa Orellana*, Linn.), and a black from the seeds of the *Ojo de venado* (*Mucuna* sp. pl.). A brown colour might be extracted from the *Dichromena pura*, Nees ab E., which abounds in the savanas, and makes on cotton and linen a stain very much like that caused by the rusting of an iron nail, hence the vernacular name, *Clava*, a *nail*. The Indians of Southern Darien paint their faces with the colour obtained from the *Bixa Orellana*, Linn., or, as they themselves term it, *Bija*. The scarlet dye observed in the hammocks of Veraguas is not given with the purple shell (*Purpura patula*, Lam.), as the people of Panama assert, but with the leaves of the *Lundia Chica*.

The cordage which the Isthmians use is solely procured from indigenous plants. The best and whitest rope is made from the fibre of the *Corteza* (*Apeiba Tibourbou*, Aubl.). A brownish-looking rope, easily affected by dampness, probably because the tree from which it is taken has saline properties, is manufactured from the *Majagua de playa* (*Paritium tiliaceum*, Adr. Juss.). The *Barrigon* (*Pachira Barrigon*, Seem.) and the *Malagueto hembra* (*Xylopia frutescens*, Aubl.) also yield a fibre fit for ropes. The hammocks of Veraguas consist of the fibres of the *Cabuya* (*Agave* sp.), and those of a Palm called *Chonta*. A strong fibre is contained in the leaves of the *Pita de zapateros* (*Bromelia* sp.), which is prepared like flax, woven into bags, or Chacaras, by different Indian tribes, and extensively used by shoemakers for sewing. The fibre surrounding the wood of the *Cucua* or *Namagua* forms a close texture of regular natural matting, which the natives soak in water, beat and make into garments, beds, and ropes, or use as sails for their canoes. The mats which the

poorer classes have to sleep upon are manufactured from the fibre of Plantain leaves (*Musa paradisiaca*, Linn.).

Numerous vegetable substances are applied to miscellaneous purposes. An infusion of the leaves of the *Tè* (*Corchorus siliquosus*, Linn.) is drunk instead of tea, and a similar preparation may be made from those of the *Freziera theoides*, Swartz, a shrub common on the volcano of Chiriqui. The aerial roots of the *Zanora* (*Iriartea exorrhiza*, Mart.), being clad with numerous spines, are used as graters; and although they are not so fine as those supplied by art, yet in a country where, from the humidity of the climate, tin ones soon get rusty, they are almost preferable. The natives chiefly employ them when grating Cocoa-nuts, which, boiled with rice, compose one of their favourite dishes. The leaves of the *Papayo* (*Carica Papaya*, Linn.) are a substitute for soap. The wood of the *Balsa* (*Ochroma Lagopus*, Swartz), being soft and light, like cork, is used for stopping bottles: the never-sinking rafts, which, at the discovery of South America, caused such surprise among the early adventurers, were then constructed of it and are so still. The fruit of the *Palo de velas* or *Candle-tree* (*Parmentiera cereifera*, Seem.) serve to fatten cattle. The wool of various *Sterculiaceæ*, the *Balsa* (*Ochroma Lagopus*, Swartz), *Ceiba* (*Eriodendron Caribæum*, Don), and *Barrigon* (*Pachira Barrigon*, Seem.), is employed for stuffing pillows, cushions, etc. Hedges are made of the *Ortiga* (*Urtica baccifera*, Linn.), *Poroporo* (*Cochlospermum hibiscoides*, H. B. et Kth.), *Pitajaya* (*Cereus Pitajaya*, De Cand.), and *Piñuela* (*Bromelia* sp.). The hard shells of the *Crescentia Cujeta*, Linn., are turned into bottles, sieves, pails, spoons, and various other household articles. In catching fish by stupefaction, the natives avail themselves of the juice of the *Manzanillo de playa* (*Hippomane Mancinella*, Linn.), the bark of the *Espavè* (*Anacardium Rhinocarpus*, De Cand.), and the leaves of the *Barbasco* (*Piper* sp.). Oil is obtained from the fruit of the *Corozo colorado* (*Elaïs melanococca*, Gærtn.), and wine, vinegar, food, habitations, clothing, and numerous other necessaries of life, from the different palms which inhabit the country. The leaves of the *Chumico* (*Curatella Americana*, Linn.) and *Chumico bijuco* (*Davilla lucida*, Presl) are used for cleaning iron, polishing and scouring wood; indeed, they serve all the purposes of sand-paper. From the *Jipijapa* (*Carludovica palmata*, Ruiz et Pav.) the far-famed Panama hats are plaited.

Nor is the flora destitute of plants which claim attention on account of their beauty, rarity, or singular configuration. The *Espiritu Santo* or Holy Ghost plant (*Peristeria elata*, Hook.) bears a flower resembling a dove, and is, like the *Flor de semana santa*, another *Orchidea*, almost held in religious veneration, and eagerly sought for when in blossom. The *Biura* (*Petræa volubilis*, Jacq.) is a flower of whose beauty those who have only seen it in conservatories can form but an inadequate idea: nothing can be more charming than the sight of whole groves overspread with the long blue racemes of this creeper; it almost baffles description. The *Palo de buba* (*Jacaranda filicifolia*, Don) is another of those plants on which poets delight to try their pen, and painters their brush. When this noble tree rises on the banks of the river, amidst the dark foliage of a luxuriant vegetation, and

waves its large panicles in the air, the foot is involuntarily arrested, and one gazes for some time lost in wonder and admiration. There is also a number of plants which exhale a delicious perfume; a long list of them could be cited, but it may suffice to enumerate the *Flor de Aroma* (*Acacia Farnesiana*, Willd.), *Buenas tardes* (*Mirabilis Jalapa*, Linn.), the different *Caracuchas* (*Plumieria* sp. pl.), *Copecillo olorosà* (*Clusia* sp.), *Dama de noche* (*Cestrum paniculatum*, Willd.), *Guavito cansaboca* (*Pithecolobium*), *Jasmin de monte* (*Tabernæmontana alba*, Mill.), *Ñorbo* (*Passiflora biflora*, Lam.), and *Manglillo* (*Ternstræmia brevipes*, DC.).

In such a country, where nature has supplied nearly every want of life, and where the consumption of a limited population is little felt, agriculture, deprived of its proper stimulus, cannot make much progress. It is, therefore, in the Isthmus, in the most primitive state: our first parents hardly could have carried it on more rudely. A spade is a curiosity, the plough has never been heard of, and the only implements used for converting forests into fields are the axe and the machete (or chopping-knife). A piece of ground intended for cultivation is selected in the forests, cleared of the trees by felling and burning them, and surrounded with a fence. In the beginning of the wet season the field is set with plants by simply making a hole with the machete, and placing the seed or root in it. The extreme heat and moisture soon call them into activity, the fertility of a virgin soil affords them ample nourishment, and without the further aid of man a rich harvest is produced. The same ground is occupied two or three years in succession; after that time the soil is so hard and the old stumps have thriven with so much energy, that a new spot has to be chosen. In most countries this mode of cultivation would be impossible to practise; but in New Granada all the unoccupied land is common property, of which anybody may appropriate as much as he pleases, provided he encloses it either artificially or by taking advantage of rivers, the sea, or mountains. As long as the land is enclosed it remains in his possession; whenever the fence is decayed the land again becomes the property of the republic. Colonial produce, such as sugar, coffee, cacao, tamarinds, etc., which require more attention than the inhabitants are wont to bestow, are merely raised for home consumption; and although the provincial government has tried to encourage this branch of industry by offering premiums for growing a certain number of plants, and the soil and climate are favourable, yet none, except a few enterprising foreigners, have taken a prominent part in the cultivation; and there is reason to believe that while the country remains so thinly populated as at present, the high price of labour, consequent on such a state of society, will be a lasting impediment to the establishing of plantations on a large scale. The cerealia grown are Rice and Indian Corn. The former was introduced by the Spaniards; the latter was known before the conquest to the Aborigines, who raised it extensively, and used to prepare from it their bread, and *chicha*, a kind of beer. Some successful experiments with Wheat have been made on the mountains of Veraguas, which will doubtless lead to an extensive cultivation of that grain. Of dessert fruit probably no country can exhibit a greater

variety. Besides many indigenous ones, there are to be found the *Aguacate* (*Persea gratissima*, Gærtn.), *Anona* (*Anona* sp.), *Aqui* (*Cupania Akeesia*, Cambess.), *Chirimoya* (*Anona Cherimolia*, Mill.), *Granadilla* (*Passiflora quadrangularis*, Linn.), *Jobo* (*Spondias lutea*, Linn.), *Lima* (*Citrus Limetto*, Risso), *Limon* (*Citrus Limonum*, Risso), *Mammey de Cartagena* (*Mammea Americana*, Linn.), Mango (*Mangifera Indica*, Linn.), Melon (*Cucumis Melo*, Linn.), *Naranja agria* (*Citrus vulgaris*, Risso), *Naranja dulce* (*Citrus Aurantium*, Risso), *Palo de Pan* (*Artocarpus incisa*, Linn.), *Papaya* (*Carica Papaya*, Linn.), *Piña* (*Ananassa vulgaris*, Lindl.), *Pomarosa* (*Jambosa vulgaris*, DC.), different species of *Ciruelas* (*Spondias*, sp. pl.), and *Toronjil* (*Citrus Decumana*, Linn.).

The Plantain furnishes the inhabitants with the chief portion of their food. The esculent roots under cultivation are *Ñame* (*Dioscorea alata*, Linn.), *Yuca* (*Manihot utilissima*, Pohl), *Batata* or *Camote* (*Batatas edulis*, Chois.), *Otò* (*Arum esculentum*, Linn.), and *Papas* (*Solanum tuberosum*, Linn.). Except the Potato, all these plants are propagated by cutting off the top of the roots (tubers, corms, etc.). The vitality of these cuttings is very great; they may be left for weeks on the field, exposed to sun and rain, without receiving any injury. Other vegetables grown are the *Challote* (*Sechium edule*, Swartz), *Guineo* (*Musa sapientum*, Linn.), *Guandu* (*Cajanus Indicus*, Spr.), *Mani* (*Arachis hypogæa*, Linn.), *Pepino* (*Cucumis sativus*, Linn.), *Sapallo* (*Cucurbita Melopepo*, Linn.), *Lechuga* (*Lactuca sativa*, Linn.), and *Col* (*Brassica oleracea*, Linn.). The Lettuce and Cabbage are raised with difficulty in the lower region; they never form any heads, and are not much liked. Tomatos (*Lycopersicum esculentum*, Mill.) and different kinds of *Aji* (*Capsicum* sp. pl.) are cultivated in considerable quantities, and are used as condiments for culinary purposes.

The other branches of agriculture are practised as rudely as that relating to the cultivation of the fields. Perhaps in a few years the old system will be overturned, and a new one be established. The great impulse given to every kind of industry in the States bordering on the Pacific Ocean by the discovery of gold in California and Australia, and the demand for food which that event has occasioned, will do their work. They must produce a progress in agriculture, which, besides increasing the opulence of the country, will have a beneficial effect upon the climate. The seasons of Rio de Janeiro were formerly similar to those of Portobelo, Chirambira, and other parts of the Isthmus,—they could hardly be divided into wet and dry. But since the axe was laid on the dense forests surrounding the city, the climate has become dry; in fact, so much has the quantity of rain diminished, that the Brazilian Government was obliged to pass a law prohibiting the felling of trees in the Corcovado range. The same effect will probably be produced in the Isthmus. When the immense forests, which at present cover the greater portion of the country, shall have been reduced, and a free circulation of air from sea to sea has been established, the rainy season will be considerably shorter, and the climate become cooler and more healthy; but to what extent that change may be accomplished is a problem which industry will have to solve.

SYNOPSIS.

RANUNCULACEÆ.

1. Clematis *Caripensis*, H. B. K., De Cand. Prodr. vol. i. p. 4. Volcano of Chiriqui, Veraguas.

This plant has been found at San Salvador, Mexico (Schiede), in Central America (Barclay), Veraguas (Seem., no. 1166), and Cumana (H. et B.), from 3–6000 feet above the sea. The leaflets are not always quite entire, as stated by De Candolle; sometimes they have two large teeth towards the apex, making them almost trilobed.

DILLENIACEÆ.

2. Tetracera *oblongata*, De Cand., Prodr. vol. i. p. 67. Panama, in savanas.

3. Davilla *lucida*, Presl (Tab. XIII.); scandens, ramulis petiolis nervisque foliorum subtus flavescenti-hirsutis demum glabratis, foliis oblongis ovatis obovatis vel ellipticis breviter acuminatis vel obtusissimis basi plus minus rotundatis vel in petiolum attenuatis integerrimis vel argute dentatis supra lucidis punctis elevatis minutis sæpe pilo rigido terminantibus scaberrimis subtus plus minus hirtis, petiolis supra canaliculatis glabris subtus convexis hirsutis, paniculis terminalibus vel axillaribus multifloris, floribus dioicis (an semper?), bracteis ovatis acutis supra glabris subtus hirsutis, calyce dense flavescenti-hirsuto demum glabrato, petalis 5 deciduis obovato-oblongis emarginatis, filamentis glaberrimis, connectivo acutiusculo subproducto, ovario . . . . , capsula . . . . .—*D. lucida*, Presl, Reliq. Hænk. vol. ii. p. 73!—*D. ovata*, Presl, l. c.!—Nomen vernac. "Chumico bejuco." In sunny places in savanas, common throughout Panama and Veraguas. Chagres (Fendl. no. 26).

Though having no authentic specimens, I entertain no doubt that both Presl's *D. ovata* and *D. lucida* are the same, and identical with the plant collected by Fendler and myself in the Isthmus; and there is reason to suppose that Splitgerber's *D. asperrima* is also a synonym. The species is extremely variable both as regards the shape of the leaves and the hairy covering. It seems to be always diœcious; no female specimens having as yet been collected. It is a handsome trailing shrub, with bright yellow flowers, and would be a great ornament to a garden. The leaves, like those of *Curatella Americana*, are employed instead of sand-paper.

Plate XIII. Fig. 1, 2, flowers; 3, petal; 4, stamen; 5, calyx closed, after the petals have fallen off; 6, the same with one of the sepals removed:—*all magnified.*

4. Davilla *multiflora*, St. Hil., Wlprs. Rep. vol. i. p. 67.—*Tetracera multiflora*, De Cand., Prodr. vol. i. p. 68. Remedios, province of Veraguas.

Remedios is the most northern station of this species as yet recorded. Gardner found it at Minas Geraes, Piauhy, and Goyaz.

5. Doliocarpus *pubens*, Mart., Wlprs. Rep. Bot. Syst. vol. i. p. 65. Village of La Mesa, Veraguas; Chagres (Fendl. nos. 50 and 335).

6. Curatella *Americana*, Linn., De Cand. Prodr. vol. i. p. 70.—Nomen vernac. "Curatella." Common in the provinces of Panama and Veraguas, in sunny places.

This species has been collected at Santamarta (Purdie), Essequibo (Schomburgk), Santarem (Spruce), and Pernambuco and Piauhy (Gardner). The leaves are used instead of sand-paper, for polishing iron and scrubbing wooden vessels. The tree has a crooked appearance, an indication of the twining habit of the tribe, and reaches the height of about thirty feet.

ANONACEÆ.

7. Anona *muricata*, Linn., De Cand. Prodr. vol. i. p. 84. Cultivated.

8. Anona *palustris*, Linn., De Cand. vol. i. p. 84. Isle of Cacagual, Darien.

9. Anona *Cherimolia*, Mill., De Cand. Prodr. vol. i. p. 85.—Nomen vernac. "Chirimoya." Cultivated in the island of Otoque, and on the volcano of Chiriqui, Veraguas.

10. Anona *reticulata*, Linn., De Cand. Prodr. vol. i. p. 85. Island of Taboga.

11. Xylopia *frutescens*, Aubl., De Cand. Prodr. vol. i. p. 92. Nomen vernac. "Malagueto chico" et "Malagueto hembra." From Panama to Veraguas, and in the island of Coyba.

A beautiful tree (not a shrub, as Aublet's name indicates), from thirty to forty feet high, with white flowers and a scarlet fruit. The bark is converted into ropes, and the carpels, as well as those of the following species, are used as condiments by the negroes. *X. frutescens* stands between *X. sericea*, St. Hil., and *X. salicifolia*, H. et B., but seems to be a well-defined species. I have seen specimens from Bahia (Salzmann), Cayenne (Martin), and Illerois (Moric.).

12. Xylopia *grandiflora*, St. Hil., Wlprs. Rep. vol. i. p. 75.—Nomen vernac. "Malagueto grande" et "Malagueto macho." In the savanas of Panama and Veraguas; island of Taboga.

Hooker's Herbarium contains specimens from Peru (Matthews), Guiana (Schomburgk), Pernambuco (Gardner), Minas Geraes (Claussen), and Santarem (Spruce).

13. Guatteria *Schomburgkiana*, Mart., Wlprs. Rep. vol. i. p. 82.—Nomen vernac. "Yalla." San Lorenzo, Veraguas, in forests.

A tree about sixty feet high, producing a hard wood, which is used for building purposes; the fruit is of about the same size as that of the Coffee shrub.

Another species of *Guatteria* was collected by Fendler at Chagres; it is his no. 3.

MYRISTICEÆ.

14. Myristica *sebifera*, Swartz, Fl. Ind. Occ. p. 1129.—Nomen vernac. "Malagueto de Montaña." In dark forests near the village of Cruces, province of Panama.

This tree is about forty feet high. Its branches are divergent in whorls, not quite so regular as in most *Coniferæ*, but sufficiently marked to produce a peculiar aspect. Its range is confined to the American continent, extending from Panama southwards. I have seen specimens from Surinam (Hostmann), Guiana (Hancock, Schomburgk), Santarem (Spruce), Goyaz (Gardner), and Minas Geraes (Claussen).

MENISPERMACEÆ.

(*Auctore J. Miers.*)

15. Cissampelos *Pareira*, Linn., De Cand. Prodr. vol. i. p. 100; Syst. vol. i. p. 553. Near the city of Panama, in shady places.

The specimens are not distinguishable from several recognized ones from the West Indian Islands. The leaves are cordate and deltoidly orbicular, obtuse at the summit, $2\frac{3}{4}$ inches diameter, and inserted at a distance of three lines from the margin, on a petiole $1\frac{3}{4}$ to 2 inches in length; they are almost glabrous above, cinereously pubescent below. Several racemes, about $\frac{3}{4}$ inch long, grow out of each axil; they are spreadingly branched upon very delicate peduncles and pedicels, the flowers being very minute.

16. Cissampelos *microcarpa*, De Cand., Syst. vol. i. p. 534; Prodr. vol. i. p. 101. In sunny exposed situations about Tolé, Veraguas.

This accords with some specimens from the Havana. The younger leaves are quite palate, as stated by De Candolle, and as they grow older they become somewhat peltate; they are deltoidly orbicular, obtuse at the summit, truncated or slightly sinuated at the base, finally pubescent above, pale and covered with a fine yellowish down below, 2 inches across both ways, with a pubescent petiole of $1\frac{1}{4}$ inches. The female inflorescence, as usual in this genus, is in the form of lengthened bracteated spikes, which in reality are nascent branches, the lengths of which vary according to their relative ages: the young leaves are therefore bracteiform, bearing in each axil a fascicle of pedicellated flowers.

17. Batschia *conferta*, Thunb., Nov. Act. Ups. vol. v. p. 120. t. 2. fig. 2.—*Trichoa spicata*, Pers., Ench. vol. ii. p. 634.—Dioica, scandens, ramulis teretibus pubescentibus demum glabratis; Masc. foliis alternis ellipticis utrinque subacutis opacis glabris nitidiusculis superne convexis circa basin 3-plinerviis in nervis profunde sulcatis et pubescentibus, venis transversis immersis subtus pallidioribus, nervis hinc valde prominentibus subpubescentibus, margine cartilagineo revoluto, petiolo subtenui tereti apice paululo incrassato glabro, racemis compositis axillaribus solitariis gracilibus subspicatis folio sublongioribus pubescentibus, floribus parvis pedunculo ramis pedicellisque bractea minima munitis; Fœm. foliis oppositis basi acutioribus apice repente breviter attenuatis planis superne glaberrimis longe supra basin 5-plinerviis in costam sulcatis nervis venisque transversis anastomosante reticulatis prominulis utrinque in areolis elevato-punctatis subtus pallidioribus, venis nervisque (præsertim in primariis et costa) valde prominentibus istis in axillis a basi remotis flavido-barbatis margine subrevoluto, petiolo breviore et crassiore tereti, racemis subcompositis utrinque axillaribus et solitariis pubescentibus petiolo vix longioribus. Bay of Ardita, Darien.

Here are two specimens, one of which sufficiently well accords with the drawing and description of Thunberg above referred to, and the other offers such dissimilar features, that, examined in the herbarium, it would be set down as distinct; but as both were found in complete juxtaposition, they must be considered as the male and female plants of the same species. The leaves of the male plant are convex on the upper surface, $2\frac{1}{2}$ to 4 inches long, $1\frac{1}{4}$ to 2 inches broad, on a petiole 6 lines in length; the slender raceme is from $2\frac{1}{2}$ to $4\frac{1}{2}$ inches long, the alternate short branches, 1 or 2 lines long, are furnished at base with a

minute linear bract, and are again subdivided, each branchlet bearing three or four alternate flowers on short bracteated pedicels, the flower scarcely exceeding half a line in length and breadth. In the female plant, the leaves in every case are distinctly opposite, and the cupular nodes on which the petioles are articulated meet across the stem by a horizontal hairy line, bearing the false appearance of scars of fallen interpetiolar stipules: the blade is quite flat, considerably more acute at both extremities, from $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, and $1\frac{1}{4}$ to $1\frac{3}{4}$ inch broad, the junction of the primary pair of nerves with the midrib being 6 or 8 lines distant from the base of the petiole, where they are clothed with a tuft of long stiff yellow hairs: the petiole measures only 3 or 4 lines, and the opposite axillary short compound racemes are about 6 lines in length.

In the male flowers, the three outer sepals are equal, oblong, acute, $\frac{1}{4}$ of a line in length, supported by two alternate, similar, but smaller bracts; the three inner sepals are much larger, alternate with the others, fleshy, somewhat triangular, with a rather obtuse reflected apex, the margins being valvate in æstivation, and afterwards still connivent at base: internally they are marked by a deep groove down the middle, and two other lateral and more shallow furrows: all the sepals and bracts are smooth inside, and pubescent exteriorly. The six stamens, nearly as long as the inner sepals, spring from the central torus in two series, being erect and quite free; the three outer, being somewhat shorter and more slender, are alternate with, while the three others are opposite to, the inner sepals: the filaments are almost terete, fleshy, somewhat sigmoid, with the apex turning outward, all slightly carinated and hairy along the external face; each at its apex bears two oval convex anther-lobes, which are separate, and half-imbedded on its two opposite sides; each lobe is bilocellate, and as their two valves contract from the line of dehiscence down their middle, they gape open by a longitudinal chink, and exhibit the septum to which the separated margins of the valves had been united. Although every flower had fallen off in the female plant, it was discernible from the examination of some extremely young buds, that they consisted of six sepals, the inner series being linear, with three free ovaria in the centre, bearing an almost obsolete style, and a sessile, obtuse, hairy stigma; at their base were seen three very minute scales, supporting a two-lobed gland, which were probably sterile stamens upon very short filaments; but they were in a state far too much undeveloped to ascertain their ultimate form.

It will be seen, from the above analysis, that in its male floral structure *Batschia* accords both with *Abuta* and *Anelasma;* judging from the imperfect indication of its female structure, it would, however, seem to be distinct from *Abuta;* and we are as yet unacquainted with the female flower of *Anelasma.* In habit *Batschia* differs equally from both these genera. In *Anelasma* the leaves are remarkably thick and fleshy, quite glabrous, with a perfectly smooth surface, three-nerved from the base, with the nervures proceeding in nearly a straight line towards the apex, quite immersed in the fleshy parenchyma on both sides, as are also the veins; and the blade is supported upon a rather long, very stiff, glabrous petiole, which is extremely tumid at both extremities. The male inflorescence consists of a fascicle of numerous, very slender, glabrous, lengthened, branching racemes, proceeding out of each axil, and from the general appearance of the specimens they seem as if they belonged to erect trees rather than to climbing plants. In *Abuta,* the leaves are generally much larger, usually more rotund in form, always extremely pubescent or thickly tomentose beneath, three-nerved, the lateral nerves being branched with numerous, strong, parallel nervelets, directed at a considerable angle towards the margin, near which they are united together by arched lines: these nervures are all intersected by transverse, raised, reticulated veins, all being extremely prominent below, and very tomentose: the petiole is generally very long, slightly thickened at each extremity, and densely tomentose. The male racemes are of extreme length, with long branches, and are also covered with thick down.

Batschia therefore will be seen to differ both from *Abuta* and *Anelasma* in its three- to five-nerved leaves; they however resemble those of *Abuta* in texture and their convex form, but they vary in being almost glabrous, with a different nervation and smooth short petioles; its female plant presents the very unusual character of opposite leaves and opposite racemes, which are very short. For these reasons,

although the elements are yet very unsatisfactory, it appears better to keep *Batschia* generically distinct until we have more conclusive evidence for identifying it with either *Abuta* or *Anelasma*. If the *Batschia racemosa* of Thunberg should turn out to be the female plant of *B. conferta*, as seems most probable (for both these species are quoted as being found in the same country, Mariquito, near Honda in New Granada), then the above-described plants will form a distinct species, to which the name of *Batschia Seemanni* may be given.

NYMPHÆACEÆ.

18. Nymphæa *blanda*, Mey., De Cand. Prodr. vol. i. p. 116. In swamps near the city of Panama.

PAPAVERACEÆ.

19. Argemone *Mexicana*, Linn., De Cand. Prodr. vol. i. p. 120.—Nomen vernacul. "Cardo santo." Common throughout the country, especially in waste places.

The root is used as an anti-syphilitic by the people of the Isthmus. The vernacular name, "Cardo santo," *i. e.* Holy Thistle, is applied to this plant throughout South America. The Mexicans call it "Chicalote," a corruption of the Aztec word *Chicalotl;* and the North Americans, "Prickly Poppy."

CAPPARIDEÆ.

20. Cratæva *gynandra*, Linn., De Cand. Prodr. vol. i. p. 243.—Nomen vernacul. "Palo de Guaco." Rio Grande de Nata.

A tree from 50 to 60 feet high, which has been found in Jamaica (M'Fadyen), St. Vincent (Guilding), Surinam (Hostmann), and Cayenne (Martin).

21. Colicodendron *subbilobum*, Seem.—*Capparis subbiloba*, H.B.K., Nov. Sp. vol. v. p. 89.—De Cand. Prodr. vol. i. p. 250. Volcano of Chiriqui, Veraguas.

Hooker's Herbarium contains specimens of *C. subbilobum* from Santamarta (Goudot), and Venezuela (Funke).

I have referred this and the following species to *Colicodendron*, a genus principally differing from *Capparis* in having a monophyllous calyx, the segments of which are valvate in æstivation, and furnished on the base with petaloid scales. For the same reason I have called *Capparis pulcherrima*, Jacq., *Colicodendron pulchellum*, Seem.; and *Capparis scabrida*, H. B. K., *Colicodendron scabridum*, Seem. Several other species of *Capparis* will yet undergo the same change.

22. Colicodendron *avicenniæfolium*, Seem.—*Capparis avicenniæfolia*, H. B. K., Nov. Sp. vol. v. p. 94.—De Cand. l. c. p. 252. Coast on the Pacific side of Darien.

This species is found in Western America, ranging between the eighth degree of north and the fourth of south latitude; it is a littoral plant, but also grows in the sandy deserts of Peru, a district which is impregnated with saline properties, and has, to all appearance, been lifted above the level of the ocean.

23. Capparis *cynophallophora*, Linn., De Cand. Prodr. vol. i. p. 249. Sea beach between the Rio Grande and the city of Panama.

The range of this plant extends over the West Indies and the southern parts of tropical America.

Specimens have been collected in St. Vincent (Guilding), Antigua (Herb. Hook.), Jamaica (Distin), Dominica (Herb. Hook.), Trinidad (Lockhart), and Cumana (Funke), and at Rio Janeiro (Gardner), Rio San Francisco (Gardner), Serro Jacobina (Moricand), and Guayaquil (Edmonston).

BIXINEÆ.

24. Bixa *Orellana,* Linn., De Cand. Prodr. vol. i. p. 259.—Nomen vernac. "Achote" et "Bixa" vel "Bija." Common on the banks of rivers.

The geographical range of this plant is not yet accurately determined; it is confined to America, being merely cultivated in the Old World, and does not seem to venture beyond the limits of the tropics. Hooker's Herbarium contains specimens from Mexico (Schiede and Deppe), Jamaica (M'Fadyen), Guiana (Schomburgk), Demerara (Parker), Guayaquil (Sinclair), Chachapogas (Matthews), and Goyaz (Gardner). The name "Arnotto," by which the plant is known in the English colonies, is derived from the Aztec *Achiotl;* and from the same source is obtained the Panamian appellation, *Achote.* The term "Bixa," or "Bija," is used by the Indians of Southern Darien, who paint their faces with the red colour obtained from the pulp.

25. Lindackeria *laurina,* Presl, Wlprs. Rep. vol. i. p. 203.—Nomen vernac. "Carbonero." Common in Veraguas, in forests.

A tree from 20 to 30 feet high; the wood is hard, and used for building purposes. The flowers are still unknown; the natives told me they were white; my specimens are only in fruit.

CISTINEÆ.

26. Cochlospermum *hibiscoides,* Humb. et Kunth, Nov. Gen. vol. viii. p. 223.—Nomen vernac. "Poroporo." Common in the provinces of Panama and Veraguas: used for making hedges.

I follow Dr. Lindley in placing *Cochlospermum* among *Cistineæ,* with which the genus seems to have more affinity than with *Ternstræmiaceæ.*

VIOLACEÆ.

27. Alsodeia *sylvatica,* Seem. (Tab. XIV.); fruticosa, ramulis pubescentibus demum glabris, foliis oppositis ovali-ellipticis acuminatis dentatis basi rotundatis subobliquis supra glabris subtus ad nervos racemisque ferrugineo-pubescentibus, racemis spiciformibus terminalibus folio brevioribus, sepalis ovato-acuminatis dorso hirtellis, petalis oblongo-linearibus apice revolutis, connectivis ovatis longe acuminatis, ovario hispido, stylo glabro. ♄. Near Cruces, province of Panama, in dark forests.

A shrub about 12 feet high, with dichotomous branches; the leaves are from 3 to 4 inches long, 1½ to 2 broad, and more or less toothed; the flowers are in simple racemes, generally drooping, and white. Ripe fruit I have not seen. The species stands between *A. prunifolia,* Sprengel, and *A. deflexa,* Bth.; but the former has no hair, different-shaped leaves, longer pedicels, and very much shorter calyces, and the latter has reflexed pedicels 1 line long, and ovate sepals only half the length of the petals. I once entertained the opinion that *A. deflexa* might be the same as my plant, and therefore asked Mr. George Bentham, who kindly undertook to set me right. "Your specimen comes near my *A. deflexa,*" he said, "in the almost sessile flowers and pubescent young branches, and midrib of the leaves; but in my plant the leaves are acute at the base, and the sepals differently shaped."

Plate XIV. Fig. 1, flower; 2, petal; 3 and 4, stamens; 5, ovary and style; 6, ovary cut open:—*all magnified.*

28. Sauvagesia *tenella*, Lam., De Cand. Prodr. vol. i. p. 316.—St. Hil. Pl. Rar. t. 3. fig. B. In the savanas near Panama.

29. Sauvagesia *erecta*, Linn., De Cand. Prodr. vol. i. p. 315. Common throughout the country in sunny places.

30. Sauvagesia *pulchella*, Planch., MSS. in Herb. Hook. (sine descriptione); annua, caule erecto subsimplici, foliis ovato-lanceolatis dentatis acutis, stipularum ciliis medio glanduliferis, floribus axillaribus binis folia æquantibus vel superantibus, laciniis calycinis ovatis acutis mucronatis petala oblongo-obtusa subæquantibus et capsula multo brevioribus. About Panama, in savanas, growing with *S. tenella*.

A herb from 6 to 8 inches high, distinguished from the allied species by having glands in the middle of the cilia of the stipules, which have almost the appearance of joints, and a capsule much longer than the segments of the calyx. I have adopted Dr. Planchon's MS. name, *S. pulchella*, though some more appropriate one might have been found. Purdie gathered specimens of it near Rio Hacha, New Granada.

POLYGALEÆ.

31. Polygala *hygrophylla*, H. B. K., De Cand. Prodr. vol. i. p. 327. Near the city of Panama, in savanas.

32. Polygala *longicaulis*, H. B. K., Nov. Gen. vol. v. p. 396.—*P. Stellera*, De Cand. Prodr. vol. i. p. 327! About the city of Panama, in savanas.

This species has been found in Mexico (Galeotti), Venezuela (Funke, Lockhart, Moritz), and British Guiana (Schomburgk), and at Natividad and Goyaz (Gardner), and Santamarta (Purdie).

33. Polygala *aparinoïdes*, Hook. et Arn., in Bot. Beech. p. 277. Island of Chirambira, Darien.

A species closely allied to *P. moluginifolia*, St. Hil.; the leaves of my specimen are more dotted than is the case in those collected during the voyage of H.M.S. Blossom in Mexico. The plant is decidedly a perennial.

34. Polygala *paniculata*, Linn., De Cand. Prodr. vol. i. p. 329. Common throughout the country.

I quote the following stations of this plant from Hooker's Herbarium: Jalapa (Coulter), Mirador (Linden), Trinidad (Lockhart), St. Vincent (Guilding), Dominica (Imray), Jamaica (Purdie), Venezuela (Funke, Moritz), Rio Janeiro (Mart.), Rio Grande, Brazil (Fox), Bahia (Salzmann), Brazil (Gardner), Minas Geraes (Claussen), Chachapogas (Mathews), Lima (Mathews, Ruiz and Pavon), and Chagres (Fendler).

35. Polygala *Caracasana*, H. B. K., De Cand. Prodr. vol. i. p. 331. Volcano of Chiriqui, Veraguas.

36. Monnina *Xalapensis*, Kunth, De Cand. Prodr. vol. i. p. 339. Volcano of Chiriqui, Veraguas.

I also found this plant in the Sierra Madre, Mexico, between Durango and Mazatlan; Hartweg gathered it at Zacatecas.

37. Securidaca *pubescens*, De Cand., Prodr. vol. i. p. 341. Near Panama, on the outskirts of forests.

ends pt. 2

38. Securidaca *tomentosa*, St. Hil., Fl. Bras. Merid. vol. ii. p. 68. t. 96.—Wlprs. Rep. vol. i. p. 246.—Capsulæ ala obovata ferrugineo-hirsuto-tomentosa. Near the city of Panama.

CARYOPHYLLEÆ.

39. Drymaria *cordata*, Willd., De Cand. Prodr. vol. i. p. 395. Throughout the Isthmus.

A common weed in both hemispheres. I have seen specimens from Ceylon (Walker, Thwaites), Kamaon (Thomson), Nepal (Wallich), Port Essington (Armstrong), Jamaica (Purdie, M'Fadyen), Trinidad (Lockhart), Mexico (Galeotti), Guiana (Schomburgk), Surinam (Hostmann), Brazil (Sellow, Spruce, Salzmann), and St. Catherine's Island (Tweede).

40. Stellaria *lanuginosa*, Torr. et Gray, Fl. of N. Amer. vol. i. p. 187.—*S. elongata*, Nutt., De Cand. Prodr. vol. i. p. 399. Volcano of Chiriqui, Veraguas.

This species has been found, besides the United States, in Mexico (Coulter), and Jamaica (Bancroft, M'Fadyen).

MALVACEÆ.

41. Malva *tricuspidata*, Ait., De Cand. Prodr. vol. i. p. 430.—*Sida carpinoides*, De Cand. l. c. p. 461. Hacienda de Cocoli, Panama.

42. Urena *sinuata*, Linn., De Cand. Prodr. vol. i. p. 442.—*U. paradoxa*, H. B. K. Nov. Gen. Am. vol. v. p. 278!—*U. heterophylla*, Presl, Reliq. Hænk. vol. ii. p. 127!—*V. Hænkeana*, Wlprs. Rep. vol. i. p. 297! Common throughout the country.

Although nearly every author, who has worked at this genus, has borne testimony to the great variation to which the Urenas are subject, still most of the species are retained and new ones created. The quantity of hair, the shape and size of the leaves, and the number of glands upon the leaves, alter according to age and locality so much, and present in one and the same specimen so many modifications, that all the so-called species ought to be united into one.

43. Pavonia *Thyphalea*, Cav., De Cand. Prodr. vol. i. p. 443. Cerro de Ancon, near Panama; Chagres (Fendl. no. 320).

44. Pavonia *sessiliflora*, H. B. K., De Cand. Prodr. vol. i. p. 444.—*P. bracteosa*, Benth. in Hook. Journ. of Bot. vol. iv. p. 118! In the savanas of the provinces of Panama and Veraguas.

A shrub from 2 to 5 feet high, with fine yellow flowers. The carpels are nearly always glabrous, but in the specimens collected by Humboldt and Bonpland they were found hirtello-hispid, and in Hooker's Herbarium there is one which has both glabrous and hairy carpels, for which reason I have united *P. bracteosa* and *P. sessiliflora*.

45. Pavonia *paniculata*, Cav., De Cand. Prodr. vol. i. p. 444. Hacienda de Cocoli, Province of Panama.

46. Pavonia (§ *Malache*, Endl.) *alba*, Seem.; fruticosa, ramulis petiolisque puberulis, foliis cordato-ovatis acuminatis serratis pellucido-punctatis, supra puberulis pilis simplicibus, subtus (præsertim junioribus) hirsutis pilis stellatis, utrinque glabratis, pedunculis axillaribus solitariis folio brevioribus vel subæquantibus supra medio articulatis versus apicem incrassatis hirsutis, involucello 8-phyllo, phyllis linearibus acutis pilosis calycem superantibus, laciniis calycinis ovatis

Begins pt. 3.

acuminatis, petalis (albis) oblongis obtusis sub-8-nerviis margine ciliolatis, carpellis inermibus glabriusculis. ♄. Cerro de Ancon, Panama.

A shrub about 6 feet high; leaves from $2\frac{1}{2}$ to 3 inches long, and from 1 to $1\frac{1}{2}$ inches broad; flowers white, and about 4 lines across. The species appears to be allied to *Pavonia corymbosa*, Willd., and *P. diuretica*, St. Hil.

47. Hibiscus *Phœniceus*, Willd., De Cand. Prodr. vol. i. p. 452.—*H. betulæfolius*, Benth. in Bot. Sulph. p. 68, fide spec. in Herb. Hook.! Taboga (Barclay); Panama, but apparently not wild.

48. Malvaviscus *mollis*, De Cand. Prodr. vol. i. p. 445.—*M. populifolius*, Presl, Reliq. Hænk. vol. ii. p. 135 ? Volcano of Chiriqui.

49. Malvaviscus *pilosus*, De Cand. Prodr. vol. i. p. 445. Panama.

50. Malvaviscus *Acapulcensis*, H. B. K., De Cand. Prodr. vol. i. p. 445. Panama.

This genus will doubtless have to be reduced to a few species, the whole being very variable; the pellucid dots, which have been considered as characteristic of some species only, are common to all, though in some cases they are but small.

51. Abelmoschus *esculentus*, Wight et Arn. Prodr. Fl. Pen. Ind. Or. vol. i. p. 53.—*Hibiscus esculentus*, Linn., De Cand. Prodr. vol. i. p. 450. Nomen vernacul. "Ñaju." Cultivated.

The unripe capsules of this plant are used for thickening soup.

52. Paritium *tiliaceum*, Adr. Juss., Wlprs. Rep. vol. i. p. 311.—*Hibiscus tiliaceus*, Linn., De Cand. Prodr. vol. i. p. 454.—Nomen vernacul. "Majagua." Common on the sea-beach of both the Pacific and Atlantic Oceans; Chagres (Fendler).

The fibre is used for making ropes, which however are not very durable. The plant is diffused over the tropical and subtropical regions of both hemispheres; the most northern station is Oahu, Sandwich Islands (Seemann), the most southern the Cape of Good Hope. In America it has been found in the following places:—Cuba (Frazer), Jamaica (Purdie, M'Fadyen), Demerara (Parker), Surinam (Hostmann), Vera Cruz (Galeotti), Ecuador (Sinclair), Peru (Hartweg), Galapagos Islands (Edmonston), Ilha do Governador (Gardner), and Bahia (Salzmann).

53. Gossypium *Barbadense*, Linn., De Cand. Prodr. vol. i. p. 456.—Nomen vernacul. "Algodon de Castilla, seu Algodon de riñon." Cultivated in gardens, and naturalized in various parts, but always in the vicinity of dwellings.

The cultivation of Cotton on a large scale has not yet been attempted in the Isthmus; the produce of the plants which are here and there raised is merely used by the different families for making wicks for lamps, etc., and does not form an article of export.

54. Sida *linifolia*, Cav., De Cand. Prodr. vol. i. p. 459. In sunny places near Panama.

55. Sida *acuta*, Burm., De Cand. Prodr. vol. i. p. 460.—*S. stipulata*, Cav., De Cand. l. c. p. 460! On the road-sides; Agua Dulce; Natá; Panama.

56. Sida *rhombifolia*, Linn., De Cand. Prodr. vol. i. p. 462.—*S. Canariensis*, Willd. Sp. vol. iii. p. 755!—*S. Hondensis*, H. B. K. Nov. Gen. Am. vol. v. p. 260!—Nomen vernacul. "Escobilla." Common throughout the country up to an elevation of 3000 feet; Chagres (Fendl. no. 13).

This little shrub is used for making brooms, hence its popular name Escobilla, and is common on the

road-sides, growing with *Cassia occidentalis* and *Petiveria alliacea*. The carpels are in the same specimen either with or without awns, as Mr. Bentham correctly observes. My plants from the Chiriqui volcano are more downy on the under side of the leaves, and several other forms were collected by me in different localities.

57. Sida *hederæfolia*, Cav., De Cand. Prodr. vol. i. p. 463. Cerro de Ancon, Panama.

58. Malachra *capitata*, Linn., De Cand. Prodr. vol. i. p. 269.—Nomen vernacul. "Malva." Common throughout the Isthmus, generally in swamps.

This plant is highly useful. Inhabitants of northern latitudes coming to the Isthmus are, on entering the country, generally visited by ulceration; their skin, in particular that of the legs and feet, assumes an unusual degree of irritability, and the slighest scratching of even a mosquito-bite will often produce ulcers and sores of the most alarming nature. If in such cases the wound is washed with an infusion of the leaves of the *Malva*, the relief experienced is great, and the cure speedily performed. In other cutaneous diseases the remedy is equally efficacious.

59. Abutilon *graveolens*, Wight et Arn. Prodr. Fl. Penins. Ind. Or. vol. i. p. 56. Island of Taboga; but apparently not wild.

60. Abutilon *rufinerve*, St. Hil. Fl. Bras. vol. i. p. 205. t. 42. Volcano of Chiriqui, Veraguas.

A shrub from 4 to 6 feet high, with yellow flowers. The leaves of my plant differ from that described by St. Hilaire, by being slightly pubescent on the upper surface.

61. Wissadula *excelsior*, Presl, Wlprs. Rep. vol. i. p. 328.—*Sida excelsior*, Cav., De Cand. Prodr. vol. i. p. 468. Hacienda de Cocoli, Panama.

STERCULIACEÆ.

62. Pachira *sessilis*, Benth. in Bot. Sulph. p. 70.—Wlprs. Rep. Bot. vol. v. p. 95.—Nomen vernacul. "Calabazuelo." Island of Taboga, Bay of Panama.

63. Pachira *aquatica*, Aubl. Guian. vol. ii. p. 725.—*Carolinea princeps*, Linn. fil., De Cand. Prodr. vol. i. p. 478. On the banks of the river Nuqui, Darien; Chagres, Province of Panama (Fendl. no. 311).

64. Pachira *Fendleri*, Seem.; caule aculeato, foliis . . . . , calyce truncato mucronato 5-dentato ferrugineo-tomentoso, petalis (albis) extus dense ferrugineo-tomentosis intus pubescenti-tomentosis, tubo staminum villoso, pilis retrorso-adpressis, antheris oblongo-reniformibus, stylo glabro, seminibus nigro-punctatis.—Nomen vernacul. "Cedro espinoso." Panama; Chagres (Fendl. no. 310).

A middle-sized tree, covered with short thick thorns. No leaves have as yet been collected. The flowers are from 3 to 4 inches long, and appear after the leaves have fallen off. I have called this species in commemoration of Mr. A. Fendler, by whom the flora of the Isthmus has been so diligently explored.

65. Pachira *Barrigon*, Seem.; caule inerme, foliis 8-foliolatis, foliolis obovato-oblongis breviter acuminatis basi acutis utrinque glabris, calyce truncato integerrimo basi glanduloso, petalis tomentosis versus apicem glabratis, tubo staminum lanato, antheris oblongo-reniformibus, capsula seminibusque maculatis. ♄. Nomen vernacul. "Barrigon." Common in the provinces of Panama and Veraguas; Chagres (Fendl. no. 312).

This species is closely allied to *P. marginata*, St. Hil., from which it differs in the leaves not being tomentose on the under side, the petals becoming glabrous towards the point, and the leaves being articulated. The tree is about 40 feet high, the leaves are 5 to 7 inches long and from $2\frac{1}{2}$ to 3 inches broad. The flowers are 3 inches long, and white inside.

66. Chorisia *rosea*, Seem.; caule arboreo, foliis . . . . , bracteolis 3 ovatis acutis, calyce irregulariter 3–5-fido extus glabro intus tomentoso, petalis (roseis) obovato-oblongis obtusis extus sericeo-tomentosis intus plus minus puberulis, tubo staminco exteriore sericeo-tomentoso apice dentato, interiore glabrato apice soluto in filamentis 5 divaricatis (ut in *Eriodendro*), stylo glabro. ♄. Volcano of Chiriqui, Veraguas.

A beautiful tree, about 30 feet high, with large rose-coloured flowers. The leaflets are unknown; the petals are from 3 to $3\frac{1}{2}$ inches long, and $\frac{3}{4}$ of an inch broad. The stamens are divided at the apex in five long filaments, nearly $1\frac{1}{2}$ inch long, distinguishing this species from others hitherto described, and bringing it close to *Eriodendron*, to which genus it would belong, save for the three bracts at the base of the calyx and the double tube of the stamens.

67. Eriodendron *anfractuosum*, De Cand., var. *Caribæum*, De Cand. Prodr. vol. i. p. 479.—Nomen vernacul. "Ceiba." David, Province of Veraguas.

68. Ochroma *Lagopus*, Swartz, De Cand. Prodr. vol. i. p. 480.—Nomen vernacul. "Balsa." Common in most of the forests.

The wood of this tree, being soft and light like cork, is used for stopping bottles; the never-sinking rafts which, at the discovery of South America, caused such surprise, were then constructed of it, and are so still, and have given rise to the popular name *Balsa* (raft). The prevalence of this plant along the coasts of South America and the West Indies has hitherto, it seems, not been sufficiently appreciated by historians, but the nature of such a tree might indeed account for much intercourse among the aboriginal races, and many an early migration which, under other circumstances, may almost appear inexplicable. The silky hair of the capsule of this plant, as well as that of other *Sterculiaceæ*, is employed for stuffing pillows and cushions.

69. Helicteris *Baruensis*, Linn., De Cand. Prodr. vol. i. p. 475. About Panama.

70. Sterculia *Carthaginensis*, Cav. Dissert. vol. vi. p. 353.—Wlprs. Rep. vol. v. p. 98.—*S. Helicteris*, Pers., De Cand. Prodr. vol. i. p. 483.—Nomen vernacul. "Panama." In the islands of the Bay of Panama, and also on the mainland, in sunny, exposed situations.

The seeds are eaten by the inhabitants.

BÜTTNERIACEÆ.

71. Büttneria *lanceolata*, De Cand. Prodr. vol. i. p. 487. Common in the Bay of Panama.

Allied to *B. brevipes*, Benth.

72. Theobroma *Cacao*, Linn., De Cand. Prodr. vol. i. p. 484.—Nomen vernacul. "Cacao." Cultivated, but not to any extent.

73. Guazuma *tomentosa*, H. B. K., De Cand. Prodr. vol. i. p. 485.—Nomen vernacul. "Guazimo torcido." Common throughout the country on the outskirts of woods.

74. Walteria *Americana*, Linn., De Cand. Prodr. vol. i. p. 492. Common in all the savanas of the Isthmus.

75. Walteria *glomerata*, Presl, Wlprs. Rep. vol. i. p. 340.—Nomen vernacul. "Palo del soldado." From Panama to Santiago de Veraguas.

A shrub from 6 to 10 feet high, with white flowers. The leaves are used as a vulnerary, but they do not appear to be very efficacious. It is said that a wounded soldier dragged himself in the shade of this shrub, and applying accidentally some of the leaves to his wound, found the bleeding stopped; hence the plant obtained the name of *Palo del soldado*, or soldier's tree. It must however be added that the same story, with more or less variation, is told of many other vulneraries of Spanish America.

76. Melochia *inflata*, Benth. in Bot. Sulph. p. 71.—*Riedleia inflata*, De Cand. Prodr. vol. i. p. 491. Volcano of Chiriqui, Veraguas; I also found it at Esmeraldas, Ecuador.

77. Melochia *nodiflora*, Benth. in Bot. Sulph. p. 71.—*Riedleia nodiflora*, De Cand. Prodr. vol. i. p. 491. Near Panama, on the road-sides.

78. Melochia *melissæfolia*, Benth., Wlprs. Rep. vol. i. p. 342. Cerro de Ancon, Panama.

79. Melochia *serrata*, Benth. in Bot. Sulph. p. 71.—*Riedleia serrata*, Vent., De Cand. Prodr. vol. i. p. 492. In the provinces of Panama and Veraguas, growing in savanas.

TILIACEÆ.

80. Hasseltia *floribunda*, H. B. K., Wlprs. Rep. vol. i. p. 352. On the banks of rivers and rivulets in Panama and Darien.

Endlicher is uncertain whether this tree has stipules or not, probably from want of materials; all my specimens have two lateral minute and decidous stipules at the base of the petiole.

81. Kellettia *odorata*, Seem. (Gen. nov.) *Calyx* tripartitus; laciniis ovatis, acutis, æstivatione valvatis. *Corolla* nulla. *Stamina* plurima, hypogyna; filamenta filiformia, libera; antheræ subrotundæ, biloculares, longitudinaliter dehiscentes. *Ovarium* sessile, ovatum, villosum, triloculare, loculis multiovulatis. *Stylus* unicus; stigma obsolete trilobum. *Capsula* . . . .—Frutex *Panamensis*, 10–12-*pedalis*; foliis *ovatis acuminatis serratis, serraturis glandulosis, supra glabris, subtus ramulis racemisque villoso-tomentosis*, stipulis *persistentibus semicordatis acuminatis serratis*; floribus *terminalibus, fasciculato-racemosis, odoratis.*

In woods near the village of La Mesa, Canton of Santiago, Veraguas.

This new genus stands close to *Sloanea*, and is named in honour of Captain Henry Kellett, R.N., C.B., the enterprising commander of the Expedition to which this Work owes its origin.

82. Sloanea *quadrivalvis*, Seem. (Tab. XV.); arborea, ramulis hirtellis, foliis oblongis vel obovato-oblongis obtusis vel breviter acuminatis basi rotundatis vel subcordatis utrinque glabris nitidis, stipulis subulatis persistentibus, pedunculis axillaribus trichotomo-trifloris, calyce 4-partito, laciniis ovato-acuminatis extus glabris intus albido-tomentellis, corolla nulla, antheris linearibus longissime acuminatis versus apicem poro dehiscentibus, ovario hirsutissimo 4-loculari, capsula 4-valvi, pilis nigris brevibus hirtellis. ♄. Nomen vernacul. "Terciopelo." In the southern parts of Veraguas.

A forest-tree, about 60 feet high, with coriaceous leaves from 4 to 5 inches long, and 1½ to 2 inches broad. Its wood is useful as timber. The capsule is about as large as a hazel-nut, and covered with short black hair, having almost the appearance of velvet, whence is derived the popular name of the tree, *Terciopelo* (*i. e.* velvet).

Plate XV. Fig. 1, calyx and ovary; 2, stamen; 3, ovary and style; 4, ovary cut open:—*all magnified.*

83. Apeiba *Petoumo*, Aubl., De Cand. Prodr. vol. i. p. 514.—Nomen vernacul. "Corteza." In the islands of the Bay of Panama and in the vicinity of the city of Panama.

From the fibre of this tree the natives manufacture cordage, which is distinguished from that made of other indigenous plants by its whiteness.

84. Lühea *rufescens*, St. Hil., Wlprs. Rep. vol. i. p. 353.—Nomen vernacul. "Guazimo colorado." Southern parts of Veraguas, in forests.

85. Heliocarpus *arborescens*, Seem.; arborescens, foliis cordatis longe acuminatis grosse et inæqualiter serratis, serraturis glandulosis, supra villosis subtus ramulis paniculisque fusco-tomentosis, stipulis deciduis, floribus paniculatis ramulosis, ramulis subdichotomis, sepalis lineari-acuminatis petala spathulato-oblonga triplo superantibus. On the banks of the river Santamaria, Canton of Natá.

A shrub or small tree from 10 to 14 feet high; leaves from 5 to 6 inches long, and from 3 to 4 inches broad; flowers whitish, appearing in November and December.

86. Heliocarpus *Americana*, Linn., De Cand. Prodr. vol. i. p. 503. Island of Taboga.

87. Corchorus *siliquosus*, Linn., De Cand. Prodr. vol. i. p. 504.—Nomen vernacul. "Te." Common on road-sides and in waste places all over the Isthmus.

An infusion of the leaves of this shrub is drunk instead of tea by the inhabitants, whence is derived the vernacular name of the plant. In Hooker's Herbarium there are specimens of this *Corchorus* collected in Jamaica (M'Fadyen) and in St. Vincent (Guilding).

88. Triumfetta *Lappula*, Linn., De Cand. Prodr. vol. i. p. 506.—Nomen vernacul. "Pega-pega." Very common in all parts of the Isthmus.

89. Triumfetta *speciosa*, Seem. (§ *Bartramea*); ramulis petiolis foliis junioribusque dense ferrugineo-tomentosis, foliis inferioribus trilobis 7-nerviis, superioribus ovatis acuminatis 3-nerviis, omnibus serratis, serraturis calloso-glandulosis, floribus cymosis, calycibus magnis coloratis extus villosis intus glabris, sepalis in tubum concretis apiculatis petala basi hirsutissima 3-plo superantibus, staminibus circiter 15, fructibus longe echinatis villosiusculis. Near the Hacienda de Boquete, volcano of Chiriqui.

A shrub about 5 feet high; the lower leaves from 5 to 6 inches long, and from 3 to 4 inches broad; the calyx unusually large for this genus, nearly 1½ inch, and bright yellow and red; the capsule about ¼ of an inch across. Altogether this species is very handsome, and would be classed among the ornamental plants by our gardeners. It was found previously in the southern parts of Mexico, by Galeotti, Jurgensen, and Linden, and at an elevation of about 3000 to 4000 feet above the sea, being the temperate region, in which it also grows in Veraguas. There is a species of *Triumfetta* in the Peruvian highlands, a specimen of which is contained in Hooker's Herbarium, but not yet described, which is allied to this one, but has petals nearly as long as the calyx. A good character of *T. speciosa* seems to be the dense mass of hair which surrounds the base of the petals.

90. Muntingia *Calabura,* Linn., De Cand. Prodr. vol. i. p. 514. In the southern parts of Veraguas.

TERNSTRŒMIACEÆ.

91. Ternstrœmia *peduncularis,* De Cand. Prodr. vol. i. p. 523.—Nomen vernacul. "Manglillo." Savanas about Panama; Chagres (Fendl.).

A fine large shrub or small tree; the flowers are esteemed by the inhabitants of the country on account of their fragrance.

92. Freziera *theoides,* Swartz, De Cand. Prodr. vol. i. p. 524.—*Cleyera theoides,* Planch. MS. in Herb. Hook. Volcano of Chiriqui, Veraguas.

93. Freziera *hirsuta,* Smith in Rees' Encycl. vol. xv. Volcano of Chiriqui, Veraguas.

Guilding found this species on the summit of the crater of the island of St. Vincent, West Indies.

94. Saurauja *montana,* Seem. (Tab. XVI.); arborescens, ramulis petiolis paniculisque ferrugineo-tomentosis, foliis ellipticis vel obovato-oblongis basi acutis apice acuminatis margine mucronato-dentatis, supra subpubescentibus vel demum glabris, subtus ad nervos venasque ferrugineo-tomentosis, paniculis axillaribus folio multo brevioribus, calyce tomentoso, laciniis obovatis obtusis, petalis obovatis obtusis vel emarginato-bilobis extus tomentellis intus glabris, ovario tomentoso-hirsuto. Volcano of Chiriqui, Veraguas.

A shrub or small tree; leaves from 8 to 10 inches long, and from 4 to 5 inches broad; corolla white; stamens numerous, adhering to the petals; styles five; ovary five-celled.

Plate XVI. Fig. 1, a whole flower; 2, calyx; 3 and 4, petals; 5, stamen; 6, ovary; 7, ovary cut open:—*all magnified.*

OLACINEÆ.

95. Ximenia *Americana,* Linn., De Cand. Prodr. vol. i. p. 533. On the sea-beach of the coast of the Pacific Ocean; common.

AURANTIACEÆ.

96. Citrus *Medica,* Risso, De Cand. Prodr. vol. i. p. 539.—Nomen vernacul. "Limon real." Cultivated.

97. Citrus *Limonum,* Risso, De Cand. l. c. p. 539.—Nomen vernacul. "Limon." Cultivated.

98. Citrus *Aurantium,* Risso, De Cand. l. c. p. 539. Naranjo dulce. Cultivated.

The wood of the Orange-tree is hard, and much used by cabinet-makers; the leaves are mixed as a spice with *Chicha;* a decoction of them is sometimes taken as a remedy against the cold, and by some drunk instead of tea. The fruit is very much eaten, and the rind made into "dulce" (sweetmeat).

99. Citrus *vulgaris,* Risso, De Cand. l. c. p. 539.—Nomen vernacul. "Naranjo agrio." Cultivated.

100. Citrus *Decumana,* Linn., De Cand. l. c. p. 539.—Nomen vernacul. "Toronjo." Cultivated.

101. Citrus sp.—Nomen vernacul. "Cidro." Cultivated.

This plant comes close to *C. Decumana*, of which it may be a mere variety; but it attains the size of a tree, and has wingless petioles, while *C. Decumana*, Linn.—or at least the plant I consider as such—always remains a mere shrub, and has winged petioles.

All the foregoing species of *Citrus* have been introduced by the Spaniards. They are now cultivated all over the country, thrive exceedingly well, and some, especially the common Lime-tree, have become quite wild.

HYPERICINEÆ.

102. Vismia *Guianensis*, Pers., De Cand. Prodr. vol. i. p. 542. Between Panama and Cruces; Chagres (Fendl.).

103. Vismia *Mexicana*, Schlecht., Wlprs. Rep. vol. i. p. 391.—Nomen vernacul. "Sangrillo." Savanas near Panama; Chagres (Fendl.).

A third species of *Vismia* was collected by Fendler at Chagres.

104. Hypericum *gnidioides*, Seem. (Tab. XVII.); suffruticosum, ramulis erectis rigidis, foliis oppositis subcoriaceis lanceolato-linearibus integerrimis acutiusculis, floribus terminalibus solitariis, calyce 5-partito, laciniis æqualibus ovato-lanceolatis, petalis oblongis, staminibus circiter 20, filamentis liberis, antheris subrotundis, ovario glabro uniloculari, stylis 3 distinctis, capsula uniloculari trivalvi. In savanas, Volcano of Chiriqui, Veraguas.

A half-shrubby plant, about 1 foot high, at first sight resembling some of the *Gnidias*, which is chiefly owing to the pale yellow flowers being terminal and half-concealed among the foliage. The leaves are from 4 to 6 lines long, and about a line broad; the corolla is hardly more than two inches across.

Plate XVII. Fig. 1, a flower; 2, portion of a petal; 3, stamens; 4, ovary and styles; 5, calyx and ripe capsule; 6, seed; 7, embryo:—*all magnified.*

CLUSIACEÆ.

105. Triplandron *lineatum*, Benth. in Bot. Sulph. p. 73. t. 28. Southern parts of Darien.

The fruit of this plant is still unknown; my specimens are in flower only. I found this species also in the Bay of Choco, and Barclay at Tumaco and San Pedro.

106. Reggeria *acuminata*, Seem.; fruticosa, foliis longe petiolatis obovato-oblongis in petiolum angustatis apice valde acuminatis glabris, paniculis ter trichotomis, pedunculis 4-angulatis, floribus fœmineis 8-bracteatis, sepalis 5 subrotundis obtusis, petalis 5 oblongis subtruncatis, stigmatibus 5, staminibus 5, ante anthesin ovario brevioribus, capsula ignota. Bay of Cupica, Darien.

A shrub, growing parasitically upon trees; leaves from 5 to 6 inches long, from $2\frac{1}{2}$ to 3 inches broad; flowers, just before opening, about as large as a good-sized pea.

107. Clusia *rosea*, Jacq., Schlecht. Linnæa, vol. viii. p. 181. t. 4.—Nomen vernacul. "Copé grande." In savanas, about the city of Panama and the town of Natá.

This species grows at first parasitically upon other trees, but after it has killed the plant to which it was indebted for its nourishment, it becomes terrestrial, and then attains a height of about 60 feet. The large parchment-like leaves are used by the country-people for writing upon, by means of a pencil or a

pointed stick—of course only when small messages are to be transmitted; but as the writing cannot be obliterated either by dampness or rain, and is legible as long as the leaves keep fresh (about four weeks), this primitive mode of communication is, in a country possessing such a wet climate as the Isthmus, more frequently resorted to than might be expected.

108. Clusia *odorata*, Seem.; foliis obovato-ellipticis obtusis in petiolum attenuatis, floribus in cymis trifidis paucifloris odoratis, sepalis 6, petalis 4 obovato-oblongis albis, stigmatibus 6 distinctis, capsula ovata.—Nomen vernacul. "Copecillo oloroso." Volcano of Chiriqui, Veraguas.

A tree from 20 to 24 feet high; leaves from 3 to 3½ inches long, 1 to 1⅓ inch broad; flowers about an inch across.

109. Clusia *pratensis*, Seem.; foliis obovato-ellipticis obtusis vel subacutis in petiolum attenuatis, floribus inodoris, calyce 8-phyllo, petalis 4 obovatis obtusis roseis vel albis sanguineo-maculatis, stigmatibus 8 distinctis.—Nomen vernacul. "Cope chico." In savanas; very common about Panama.

A handsome tree, generally terrestrial, about 18 feet high; leaves 5 inches long, and from 1½ to 2 inches broad: primary veins very prominent in the dried specimen, and on each side of the leaves from 18 to 22 in number; flowers 1½ inch in diameter; capsule about three-quarters of an inch long.—The leaves, like those of *Clusia rosea*, are used for writing upon, and when bruised, employed as a vulnerary.

There is besides another species of *Clusia* in my collection from the Volcano of Chiriqui, but the specimens are too imperfect to be determined.

110. Monorobea *globulifera*, Schlecht. Linnæa, vol. viii. p. 190. Chagres (Fendl.).

111. Mammea *Americana*, Linn., De Cand. Prodr. vol. i. p. 561.—Nomen vernacul. "Mamey de Cartagena." Cultivated all over the country, on account of its edible fruit.

112. Rheedia *lateriflora*, Linn., De Cand. Prodr. vol. i. p. 564. Dark woods of Southern Veraguas.

The male flowers of this tree are 2-sepalous, 4-petalous.

113. Calophyllum *Calaba*, Jacq.? De Cand. Prodr. vol. i. p. 562. In dark woods near Remedios, Veraguas.

There are no flowers; the description of the leaves agrees very well with those of my specimens.

114. Calophyllum *edule*, Seem.; arborea, foliis elliptico-lanceolatis in petiolum attenuatis apice acuminatis, pedunculis axillaribus geminis, calyce 2-sepalo, sepalis obtusis, petalis . . . . , staminibus 10–12 persistentibus, drupa oblonga flava unisperma.—Nomen vernacul. "Sastra." In dark forests, near the village of San Lorenzo, Veraguas.

A tree about 50 feet high, with a fine dark green foliage; leaves from 3 to 4 inches long, and from 1 to 1½ inch broad; the petals I have not seen; the fruit, which is edible, is about the size of a hazel-nut, and has a pleasant taste; the seed is about as large as a coffee-bean.—This species seems to come close to *C. Madrunno*, H. B. K., the fruit of which is also eaten.

MARCGRAVIACEÆ.

115. Marcgravia *umbellata*, Linn., De Cand. Prodr. vol. i. p. 566. In dark woods; Cape Corrientes, Darien.

116. Ruyschia *bicolor*, Benth. in Bot. Sulph. p. 73. t. 29.—Wlprs. Rep. vol. v. p. 145. Bay of Cupica, Darien.

117. Ruyschia *lepidota*, Miq., Wlprs. Rep. vol. ii. p. 811. Isle of Coyba, coast of Southern Veraguas.

This is a well-defined species, easily distinguished by its lepidote leaves, and biauriculated—not tripartite—bracts, from all the others; it seems to approach closest to *R. clusiæfolia*, Jacq.

118. Ruyschia? *subsessilis*, Benth. in Bot. Sulph. p. 73.—Wlprs. Rep. vol. v. p. 146. Collected previously in Darien; was not met with by me.

HIPPOCRATEACEÆ.

119. Hippocratea *discolor*, Mey., De Cand. Prodr. vol. i. p. 568. Bay of Ardita, Darien.

This species seems to be closely allied to, if not identical with *H. excelsa*, H. B. K., a tree which, according to Bentham, is found in Veraguas.

120. Hippocratea *integrifolia*, A. Rich., Wlprs. Rep. vol. ii. p. 812. Island of Coyba, coast of Veraguas.

Easily distinguished from the other species of this genus by its glabrous branches and foliage, thick, coriaceous, quite entire leaves, large yellow flowers, and roundish carpels. I have seen specimens from Jamaica (M'Fadyen, Wilson), St. Vincent (Guilding), and Berbice (Schomburgk).

121. Hippocratea sp. Paredez Islands, Veraguas.

Of this species I collected only the carpels, which were strewed on the ground; the stems of the trees from which they had fallen were nearly 80 feet high, preventing me from procuring any of the leaves.

122. Hippocratea sp. Vulgo dicitur "Amanza muger." Darien.

The carpels of this species are brought by the Indians of Darien to Panama, where they are sold; it is said that when administered internally to women, they produce a state of excitement, hence the vernacular name "Amanza muger," *i. e.* to make woman amorous. The carpels are at the margin deeply and regularly dentato-sinuated, and about $1\frac{1}{2}$ inch across; the plant itself I have not seen.

123. Salacia *pruinosa*, Seem.; scandens, ramulis verrucosis vel albo-punctatis, petiolis foliis fructibusque pruinosis, foliis ovato-oblongis vel obovato-oblongis integerrimis breviter acuminatis glabris subtus minutissime punctatis, cymis axillaribus dichotomis, floribus minutis, calycis laciniis fimbriatis, petalis oblongis obtusis fimbriatis, fructu cylindrico-clavato unispermo, semine obovato-oblongo, testa membranacea. Hacienda de Tapia, Province of Panama.

Allied to *S. lævigata*.—The leaves are from 5 to 6 inches long, and from $1\frac{1}{4}$ to 2 broad; the fruit I have not seen fully developed, the largest on my specimens are about 2 inches long; they look somewhat like young cucumbers.

ERYTHROXYLEÆ.

124. Erythroxylon *floribundum*, Mart., Wlprs. Rep. vol. i. p. 407. Near the village of San Lorenzo, Veraguas.

MALPIGHIACEÆ.

125. Malpighia *glabra*, Linn., Wlprs. Rep. vol. v. p. 153.—Nomen vernacul. "Cerezo de Castilla." Common in dry, sunny localities, and cultivated in some parts.

This is one of the plants which the natives are fond of planting near their dwellings and in their gardens, and it is probable that it was originally introduced, if not from Spain—as the vernacular name would seem to imply—at least from some of the West India Islands. On account of its edible berry it is cultivated in various parts of tropical America, and, like many other cultivated plants, very variable. It is therefore not only likely, but almost certain, that several of those species which are now considered mere allies of *M. glabra* are nothing but forms or varieties of it.

126. Malpighia *glabra*, Linn., var. *acuminata*, Adr. Juss., Wlprs. vol. v. p. 153. On the outskirts of woods.

127. Byrsonima *Cumingiana*, Adr. Juss., Wlprs. Rep. vol. v. p. 161.—Nomen vernacul. "Nanci." Common in the savanas of the Provinces of Panama and Veraguas (Cuming, Hinds, Fendler, no. 24).

A tree from 25 to 30 feet high; the foliage has, on account of the tomentum with which both sides of the leaves, but especially the under surface, are clad, a rather dull appearance; notwithstanding, during the dry season, when the dark yellow racemes make their appearance, the tree forms an imposing sight, the whole being one mass of flowers. In an economical point of view the Nanci is of some value. A decoction of the bark is considered an efficacious remedy for cutaneous eruption—a disease very frequent in the country which the tree inhabits; the wood is durable, and used for building purposes; the berry is, like those of most *Malpighiaceæ* bearing the same kind of fruit, eaten by the natives, but has a very poor flavour. By a mistake I mentioned in the Introduction the Nanci as *B. cotinifolia*, H. B. K.

128. Bunchosia *glauca*, H. B. K., Wlprs. Rep. vol. v. p. 193.—Nomen vernacul. "Cerezo." In sunny, exposed places (Panama, Cruces, Juan Lanas).

The berry of this shrub is eaten, and has very much the flavour of carrots.

129. Bunchosia *mollis*, Benth., Wlprs. Ann. vol. ii. p. 199. Near the city of Panama, on the outskirts of woods.

130. Brachypteris *borealis*, Adr. Juss., Wlprs. vol. v. p. 202. Chagres (Fendl. no. 49).

131. Stigmaphyllon *Humboldtianum*, Adr. Juss., Wlprs. Rep. vol. v. p. 211.—*Banisteria Humboldtiana*, De Cand. Prodr. vol. i. p. 588. Ruins of Panama Viejo.

132. Stigmaphyllon *puberum*, Adr. Juss., Wlprs. Rep. vol. v. p. 217.—*Banisteria fulgens*, De Cand. Prodr. vol. i. p. 590 (non Linn.). Bay of Solano, Darien.

133. Stigmaphyllon *mucronatum*, Adr. Juss., Wlprs. Rep. vol. v. p. 218.—*Banisteria mucronata*, De Cand. Prodr. vol. i. p. 589. Common in Panama and Veraguas, up to an elevation of 5000 feet.

The specimens from the higher mountains differ from those gathered in the lower coast region by their larger flowers.

134. Banisteria *argentea*, Spr., Wlprs. Rep. vol. v. p. 225.—*B. Schomburgkiana*, Benth. in Hook. Lond. Journ. of Bot. vol. vii. p. 129. Near the city of Panama.

135. Banisteria *ferruginea*, Cav., Wlprs. Rep. vol. v. p. 242. Losaria, near Panama.

136. Heteropteris *Lessertiana*, Adr. Juss., Wlprs. Rep. vol. v. p. 270.—De Cand. Prodr. vol. i. p. 592. Araijan, Cruces, and Gorgona, Province of Panama.

A second species of *Heteropteris*, *H. platyptera*, De Cand., was collected at Chagres (Fendl. no. 46 and 309).

137. Tetrapteris *calophylla*, Adr. Juss., Wlprs. Rep. vol. v. p. 305. At Panama and Santiago de Veraguas.

138. Tetrapteris *Panamensis*, Seem.; ramulis petiolis foliisque junioribus villoso-tomentosis, foliis obovatis vel oblongis obtusis mucronatis supra glaberrimis subtus villoso-pubescentibus, petiolo eglanduloso, umbellis quadrifloris paniculas laterales terminalesve componentibus, pedicellis elongatis gracilibus villosis, calyce eglanduloso villoso, petalis glabris (flavis), antheris glabris, ovariis villosis, samaris . . . . Near Santiago de Veraguas.

Branches ultimately glabrous; leaves from 3 to 4 inches long, and $1\frac{1}{2}$ to 2 inches broad; stipules linear, inserted at the base of the petiole; pedicels about from 1 inch to $1\frac{1}{3}$ inch long.

SAPINDACEÆ.

139. Cardiospermum *coluteoides*, H. B. K., De Cand. Prodr. vol. i. p. 602. Near the city of Panama.

140. Serjania *grandis*, Seem.; ramulis petiolis nervis venisque foliolorum et pedunculis rufo-tomentosis, foliis trifoliolatis, foliolis grosse crenatis, lateralibus sessilibus ovatis obtusis, terminali breviter petiolato sub-trilobo basi subcuneato, sepalis obovato-oblongis obtusis pubescentibus, samaris semicordatis apice dense rufo-villosis. South-western Veraguas.

The entire leaf, including the petiole, 7 inches long; terminal leaflet $3\frac{1}{2}$ inches long, $2\frac{1}{2}$ inches broad; lateral leaflets 2 inches long, $1\frac{1}{2}$ inch broad. Flowers in lateral and terminal panicles; samaras 1 inch long, and at the lower end half an inch broad; seed about the size of a lentil, black, shining.

141. Serjania *Salzmanniana*, Schlecht., Wlprs. Rep. vol. v. p. 359. Volcano of Chiriqui, Veraguas.

142. Serjania *paucidentata*, De Cand. Prodr. vol. i. p. 603. Cape Corrientes, Darien.

143. Serjania *pubescens*, H. B. K., De Cand. Prodr. vol. i. p. 603. Very common all over the country and the islands in the Bay of Panama.

There is also a form of this species from the Volcano of Chiriqui, which is less downy than the common one, the leaves being sometimes quite glabrous.

144. Serjania *velutina*, Cambess., Wlprs. Rep. vol. i. p. 412; var. foliis pellucido-punctatis. Near the town of Natá, Province of Panama.

145. Serjania *paniculata*, H. B. K., De Cand. Prodr. vol. i. p. 603. Santiago de Veraguas.

146. Serjania *triternata*, Willd., De Cand. Prodr. vol. i. p. 604. Village of San Juan, and Hacienda de Juan Lanas, Province of Panama.

All the *Serjanias* here enumerated are found in exposed sunny situations on the outskirts of woods,

and among the shrubs of the savanas, with the exception of *S. triternata*, which grows in the depth of the virgin forests*.

147. Schmidelia *inæquilatera*, Mart., Wlprs. Rep. vol. i. p. 415. Santiago de Veraguas.

148. Cupania *Akeesia*, Cambess.—*Blighia sapida*, Kœnig, De Cand. Prodr. vol. i. p. 609.—Nomen vernacul. "Aqui." Cultivated, but only in a few gardens of Panama; it was introduced from Jamaica about the year 1840.

149. Cupania *lævigata*, Miq., Wlprs. Ann. Bot. vol. ii. p. 215.—Nomen vernacul. "Varilaso." Near the city of Panama and the ruins of Panama Viejo.

150. Cupania *sylvatica*, Seem.; ramulis foliis rhachibusque rufo-tomentosis demum glabris, foliis trijugis, foliolis obovato-oblongis breviter acuminatis basi acutis vel cuneatis margine integerrimis, racemis axillaribus, calyce dense rufo-tomentoso, petalis calycem subæquantibus extus subglabris intus filamentisque albo-pilosis, staminibus 8, ovario villoso, fructu . . . .—Nomen vernacul. "Parimonton." In dark woods, Cruces and Gorgona, Province of Panama.

A large shrub or small tree; leaves, including the common petiole, 1 foot long; the upper leaflets, the largest 5 inches long, 2½ broad; veins in the lower leaflets ten, in the upper fourteen; lobes of the calyx ovate, acute; petals obovate, obtuse.

MELIACEÆ.

151. Melia *Azedarach*, Linn., De Cand. Prodr. vol. i. p. 621.—Nomen vernacul. "Jasinto." Cultivated, but also naturalized in many parts.

152. Trichilia *spondioides*, Swartz, De Cand. Prodr. vol. i. p. 622. In dark forests, city of Panama, village of Cruces, Province of Panama.

153. Trichilia *Havanensis*, Jacq., De Cand. Prodr. vol. i. p. 622. Volcano of Chiriqui, Province of Veraguas.

154. Moschoxylon *Veraguasense*, Seem.; arborea, foliis imparipinnatis, foliolis trijugis ovato-lanceolatis acuminatis subtus ad axillas nervorum pilosis, paniculis terminalibus petiolo duplo superantibus, rhachi pubescente demum glabrato, calyce breviter 5-dentato, petalis basi coalitis acutis glabris (albidis), staminibus 10, ovario glaberrimo. Volcano of Chiriqui, Veraguas.

A tree about 20 feet high; leaves alternate, about 9 inches long; petiole glabrous, with the exception of the axils of the leaflets, which, like the axils of the nerves of the leaflets, are clothed with single tufts of hair; leaflets quite entire, and nearly 13 inches long; flowers larger than those of most of the species of this genus, about 1½ line long.

AMPELIDEÆ.

155. Cissus *sicyoides*, Linn., De Cand. Prodr. vol. i. p. 628. Panama; Chagres (Fendl. no. 52).

156. Cissus *obtusata*, Benth. Bot. Sulph. p. 77.—Wlprs. Rep. vol. v. p. 377. Island of Taboga; Panama (Sinclair).

* *Serjania Caracasana*, Willd.—which I confess myself unable to distinguish from *S. glabrata*, H. B. K.—was collected by me at Sua, in Ecuador.

The leaves of this species, like those of most quickly growing plants, are subject to considerable variation both in shape and size. Sometimes their apex is quite obtuse, as in the form described by Bentham, sometimes it is long acuminated. Occasionally they attain as much as six inches in length, but very often not half that length. Their nerves are either glabrous or more or less covered with hair. A good character of this species seems to be the leaves being cuneate at the base, the cymes divided into five bifid branches, and the fruit being obovate (and black).

157. Cissus sp. Panama.

Appears to be *C. elliptica*, Schlecht. (Linnæa, vol. v. p. 221), but the specimen is too imperfect for determination.

158. Vitis *Caribæa*, De Cand. Prodr. vol. i. p. 634. In woods near the village of Cruces, Province of Panama.

Hooker's Herbarium contains specimens of this species from Jamaica (M'Fadyen), Jalapa (Galeotti), Zinapan (Coulter), and Vera Cruz (Linden).

TROPÆOLEÆ.

159. Tropæolum sp. Volcano of Chiriqui, Veraguas (Warszewiez).

Mr. Warszewiez showed me this species at Panama; I did not find it myself, nor do I know whether it has been described.

OXALIDEÆ.

160. Oxalis *hedysaroides*, H. B. K., De Cand. Prodr. vol. i. p. 691.—Wlprs. Rep. Bot. vol. i. p. 489. Punta de Garachine, Bay of Panama.

This species has also been found in the following localities:—St. Vincent (Guilding), Dominica (Imray), Trinidad (Lockhart), Santamarta (Purdie), Essequibo (Schomburgk), Brazil (Burchell, Swainson).

161. Oxalis *Neæi*, De Cand. Prodr. vol. i. p. 690.—Wlprs. Rep. vol. i. p. 489. In savanas about Natá.

Sinclair found this species in the Gulf of Fonseca.

ZYGOPHYLLEÆ.

162. Tribulus *maximus*, Linn., De Cand. Prodr. vol. i. p. 704. A common weed in fields, gardens, and waste places.

XANTHOXYLEÆ*.

163. Xanthoxylum *Pterota*, H. B. K., De Cand. Prodr. vol. i. p. 725. Volcano of Chiriqui, Veraguas.

The leaves of this species are occasionally trifoliolate, and the flowers generally paniculate. It

* *Ruta graveolens*, Linn., De Cand. Prodr. vol. i. p. 710, is frequently cultivated in the gardens of Panama, under the name of "*Ruda*."

appears to be common on the mountains of the West Indies, but I am not aware that it had previously been found on the continent of America, except in Mexico by Bates.

164. Xanthoxylum *spinosum?* Swartz, De Cand. Prodr. vol. i. p. 726.—Nomen vernacul. "Acabú." In woods near Panama.

Having none but leaves of young plants, and knowing that they differ essentially from those of old ones, I am unable to determine positively whether the Acabú of Panama is identical with *X. spinosum* of Swartz. The wood of the Acabú is considered durable, and used for building purposes.

SIMARUBACEÆ.

165. Quassia *amara,* Linn. fil., De Cand. Prodr. vol. i. p. 161.—Wlprs. Ann. Bot. vol. i. p. 161.—Nomen vernacul. "Guavito amargo." Island of Taboga; Veraguas.

The bark of this tree is used by the natives as a febrifuge, but has hitherto not been exported from the Isthmus to foreign countries.

166. Simaba *Cedron,* Planch., Wlprs. Ann. Bot. vol. i. p. 163.—Nomen vernacul. "Cedron." On the outskirts of forests, the banks of rivers, and the sea-shore, in Darien, Panama, and Veraguas.

The *Cedron* has probably been known to the aborigines of New Granada from time immemorial, and was early brought to the notice of Europeans. The 'History of the Buccaniers of America,' a work published in London in the year 1699, contains the first account of the Cedron. Its use as an antidote for snakes, and its place of growth,—the Island of Coyba, on the coast of Veraguas,—are there distinctly stated; but whether on the authority of the natives, or on that of the Buccaniers, does not appear. If the former was the case, the rovers must have become acquainted with the tree while on some of their cruizes on the Magdalena river; for in the Isthmus of Panama its very existence was unsuspected until lately; the seeds being always imported from Cartagena. Mutis, as would appear from a communication of Dr. Cespedes, seems to have been acquainted with the Cedron, and doubtless wrote upon it; but, as most of his works were burnt, by order of the Spanish Government, on the principle that "learning did not become Creoles," that account has not been handed down to us. But, as may be suspected, a plant possessing such beneficial properties as the Cedron, and rendered famous by both the traditions and the history of the country which it inhabited, was not doomed to oblivion. About the year 1843, the Government of New Granada sent a commission of several medical men and students, accompanied by Dr. Cespedes, Professor of Botany in the University of Bogotá, to ascertain what plant and locality produced the Cedron, and in what quantities the seeds might be procured. The commission seems to have reported so favourably upon the subject it was despatched to investigate, that the Cedron was speedily introduced into the pharmacopœias of New Granada; and it is now to be seen in all the apothecaries' shops of that republic. The commission did not settle the question botanically; still, it may be said to have led to it; for when Mr. William Purdie, late Collector for the Royal Botanic Gardens at Kew, was at Bogotá, his attention was directed to the plant in question by Dr. Cespedes, who supplied a tolerably correct drawing of it, and also information respecting the exact locality in which the celebrated antidote was to be met with. Mr. Purdie, taking advantage of the intelligence, proceeded, in 1846, to the banks of the Magdalena; but on reaching the village of Nari, one of the places where the plant grows, he found that the inhabitants had already collected their little hoard of Cedron, and could only be induced to show to him a few seeds, unless he would purchase some, which he was not going to do, as all those shown to him had lost their germinating power; the people told him, moreover, that it would be useless to search for more fruit, all the trees having been already pillaged. Not deterred by such discouraging prospects, Mr. Purdie commenced searching the forest in all

directions; and, after an exertion of three days, he succeeded in obtaining about thirty ripe fruits, and perfect leaves and flowers of the tree. Some of the seeds were sown in a Wardian case, and, together with the specimens for the herbarium, transmitted to the Royal Botanic Gardens at Kew, where the former soon became young plants, and whence they were distributed amongst various botanical and horticultural establishments; while the latter were briefly described by Dr. Planchon, in his dissertation on *Simarubaceæ* (Hooker's 'London Journal of Botany,' vol. vi. p. 566), under the name of *Simaba Cedron*. Attempts have been made to wrest from Mr. William Purdie the honour of having been the actual discoverer of the Cedron, and to confer it upon Dr. Luigi Rotellini. Such attempts are not likely to succeed. It is true that Dr. Rotellini, in a paper entitled 'Observazioni terapeutiche sopra alcuni Prodotti Vegetali della Nuova Granada,' printed in the 'Annali Medico-Chirurgici del Dottor Telemaco Metaxo' (anno vii. vol. xii. p. 281), drew the attention of the scientific world to the Cedron; but the learned Doctor himself never saw the tree, referred it to *Apocyneæ*, and mixed up his account with various fables and inaccuracies, derived from oral communications of the aborigines; while Mr. Purdie not only inspected the tree in its *native* locality, and gave an intelligible account of its virtues and properties, but collected such specimens as enabled competent botanists to determine the systematic station of the plant.

It had been supposed that the Cedron was to be found only on the banks of the Magdalena; but about the year 1845, a Panamian gentleman ascertained that it grew in Darien; and in 1847, 48, and 49, I myself found it in various parts of Darien, Veraguas, and Panama. The specimens transmitted by me, together with those previously sent by Mr. Purdie, enabled Sir William J. Hooker to publish, in December, 1850, a full description of the plant, and to accompany it by an excellent figure, from the skilful pencil of Mr. William Fitch. To complete the history of the Cedron, it is necessary to add, that on the 7th of April, 1851, at a meeting of the Paris Academy of Sciences, it was announced that M. Lecoy had succeeded in separating the active principle on which the therapeutic properties of the Cedron depend, and that he had called it "*cedrine*." Thus, it took exactly 150 years, after the Cedron was first brought into notice, before a satisfactory account of the tree and its properties was obtained.

The Cedron seems to be confined to the republic of New Granada, ranging from about the 5th to the 10th degree of north latitude, and from 75° to 80° of west longitude. It is generally met with on the outskirts of woods, on the banks of rivers, and on the sea-shore, but it is never found under other trees; and although it occasionally forms small groves, yet it never constitutes extensive woods by itself, and must always be considered as a rare plant. The tree attains a height of about fifteen feet; the stem, when about twelve feet high, produces a terminal panicle, which prevents it from prolonging itself; but, instead, side branches appear, which also, in their turn, send forth terminal flowers and side branches. The effect of this mode of growth is, that the tree looks as if cut, something like *Salix capitata*, or perhaps more like a full-grown *Cycas circinalis*, and may therefore be called a "magnified umbella." In diameter the stem seldom exceeds six inches. The pinnated leaves are glabrous, from two to three feet long, and have generally more than twenty leaflets. The panicle (not raceme) is very often from three to three and a half feet long, and bears flowers about an inch in diameter, the corollas of which are externally covered with a brownish hair; internally they are glabrous, and of a greenish colour. The stamens are ten in number, and the ovaries five; but in most cases only one of the latter is developed into a mature fruit, the rest being usually abortive. The fruit, about the size of a swan's egg, has the appearance of an unripe peach, being covered with a short hair. Each of these fruits (drupes) contains one seed (the Cedron of commerce), easily separated into two large cotyledons, which look very much blanched almonds, but are larger and plano-convex.

Every part of the plant, but especially the seed, is, owing to the presence of cedrine, intensely bitter. On account of this principle, it is extensively, and with considerable success, used in cases of intermittent fever, by the physicians of New Granada, a country in which forests of Quina-trees abound. But the chief reputation of the Cedron rests upon its being considered an efficacious antidote for the bites of snakes,

scorpions, centipedes, and other noxious animals; and so highly do the natives of the land in which it grows value it, that they will pay as much as from one to four shillings for a single seed. Indeed, there is hardly a person in New Granada or the adjacent states who does not possess a piece (cotyledon) of Cedron; the lower classes carrying it on a cord around the neck; the upper, mostly in their purses or cigar-cases. When any one is bitten, a little, mixed with water, is applied to the wound, and about two grains scraped into brandy, or, in the absence of that liquor, into water, and administered internally; and it is universally believed that the application will neutralize the venom of the most dangerous reptiles and other animals.

Nothing more seems to be known of the Cedron. Whether in all climates, and against the bites of all venomous animals, it will prove an efficacious antidote; whether it will ultimately be considered a more powerful agent for counteracting fever than Quinine; is at present impossible to say. One thing is certain—that the Cedron, unless propagated by artificial means, will always be a scarce article, and consequently too expensive to be generally employed, or to be used as a substitute for drugs which, produced spontaneously by nature, may be obtained in unlimited quantities, and at a cheap rate.

167. Simaruba *glauca*, De Cand. Prodr. vol. i. p. 733.—Wlprs. Ann. Bot. vol. i. p. 164.—Nomen vernacul. "Aceituno." On the outskirts of woods, Veraguas.

A middle-sized tree, from 25 to 30 feet high; its fine foliage renders it a conspicuous object.

168. Picramnia *umbrosa*, Seem. (Tab. XXIV.); arborea, ramulis foliisque junioribus rufo-hirtellis demum glabris, foliis 9–11-foliolatis, foliolis petiolulatis ovato-lanceolatis integerrimis acuminatis, acumine obtuso, basi acutis vel cuneatis, racemis axillaribus aggregatis, rhachi pedicello calyceque rufo-hirtellis, floribus solitariis pentameris pedicellis inarticulatis, petalis ovato-lanceolatis longe acuminatis, fructu . . . . In dark woods near the Hacienda de Juan Lanas, Province of Panama.

A middle-sized tree. Leaves from 9 to 14 inches long; leaflets from 2½ to 3 inches long, about 1 inch broad; flowers growing out of the old wood; racemes about 6 inches long. Female flowers and fruit unknown.—This species comes close to *P. longissima*, Tulasne, and *P. pentandra*, Swartz: from the former it is distinguished by its rufo-hirtellous branches, leaves, and racemes, and inarticulated pedicels; from the latter by its simple axillary racemes and solitary pedicels.

Plate XXIV. Fig. 1, a male flower; 2, the same cut open; 3, a petal:—*all magnified.*

169. Picramnia sp. Volcano of Chiriqui, Veraguas.

Probably a new species, allied to *P. Lindeniana*, Tulasne, but, the flowers being in an imperfect state of preservation, I shall not attempt to describe it.

OCHNACEÆ.

170. Gomphia *nitida*, Swartz, De Cand. Prodr. vol. i. p. 737. In dark forests near Cruces, Gorgona, and Chagres, Province of Panama.

171. Cespedesia *macrophylla*, Seem.; arborea, glabra, foliis obovato-spathulatis obtusis in petiolum augustatis margine mucronato-dentatis, paniculis terminalibus ramosis, floribus aggregatis, laciniis calycinis obtusissimis infra medium in cupulam concretis, petalis obovato-spathulatis, ovario sulcato. Bay of Utria, Darien.

A most beautiful tree, about 40 feet high. Leaves from 1½ to 2 feet long, and from 6 to 8 inches broad; panicles terminal, from 3 to 4 feet long; petals bright yellow.

RHAMNEÆ.

172. Gouania *Blanchetiana,* Miq., Wlprs. Ann. vol. ii. p. 272.—Fructibus trialatis glabris. Near the village of Remedios, Veraguas.

My specimens agree perfectly well with Miquel's description; the leaves are however occasionally lanceolate and long-acuminated.

173. Gouania *tomentosa,* Jacq., De Cand. Prodr. vol. ii. p. 39.—*G. corylifolia,* Raddi, Mem. Fl. Bras. add. p. 16?—Nomen vernacul. "Javonsillo." Very common in Southern Veraguas and Panama.

SAMYDEÆ.

174. Casearia *ramiflora,* Vahl, De Cand. Prodr. vol. ii. p. 49. excl. syn.—*Iroucana Guianensis,* Aubl. Guian. vol. i. p. 329. t. 127. In woods near the village of Cruces, Province of Panama.

175. Casearia *corymbosa,* H. B. K., De Cand. Prodr. vol. ii. p. 49. From Panama to David, in open exposed situations.

176. Casearia *spinosa,* Willd., De Cand. Prodr. vol. ii. p. 49. Town of David, Veraguas, in savanas.

177. Casearia *parviflora,* Willd., De Cand. Prodr. vol. ii. p. 49. From Santiago de Veraguas to David, in savanas.

178. Casearia *Javitensis,* H. B. K., De Cand. Prodr. vol. ii. p. 51.—*C. densiflora,* Benth. in Hook. Journ. of Bot. vol. iv. p. 113! In Southern Veraguas.

I do not think there is any real distinction between *C. Javitensis* of H. B. K. and *C. densiflora* of Bentham; I should also be inclined to consider *C. parviflora* of Willdenow and *C. sylvestris* of Swartz the same, the leaves of the two latter being sometimes quite entire, sometimes slightly crenated.

179. Edmonstonia *pacifica,* Seem., (Tab. XVIII.) (Gen. nov.) *Calyx* persistens, coloratus (roseus), quadrifidus, laciniis obtusis per æstivationem anguste imbricatis. *Corolla* nulla. *Stamina* 4, calycis fundo inserta, filamenta libera, omnia fertilia. *Antheræ* introrsæ, cordato-ovatæ, biloculares, longitudinaliter dehiscentes. *Ovarium* liberum, uniloculare, placentis parietalibus 3, ovulis plurimis semianatropis. *Stigmata* 3, sessilia. *Fructus* . . . .—Frutex *Darienensis,* ramulis *subangulatis*; foliis *alternis, coriaceis, impunctatis, glabris, oblongis, acuminatis, dentatis, basi obtusis vel inæquilateralibus;* stipulis *petiolaribus geminis;* paniculis *axillaribus, bracteatis;* floribus *sessilibus, basi bractea cupulæformi instructis.*

Cape Corrientes, Darien.

A shrub or small tree, from 10 to 12 feet high. Leaves from $1\frac{1}{3}$ to $1\frac{1}{2}$ feet long, and 5 inches broad; panicles glabrous, about 4 inches long, and the rhachis, as well as the flowers, of a more or less dark rose-colour; flowers about half a line in diameter; ovary hairy.—I have placed this genus among *Samydeæ,* because it agrees in nearly all essentials with that Order, but its place in the Natural System can only be definitely settled when the fruit shall be known. There are no transparent dots in the leaves, but that would be no objection to its union with the Order with which I have provisionally incorporated it, as all *Samydeæ* with coriaceous leaves, as for instance *Casearia Javitensis,* are destitute of dots.

I have named this genus in commemoration of Mr. Thomas Edmonston, a native of Buness, North

Britain, author of the 'Flora of Shetland,' and late naturalist of H.M.S. Herald, who unfortunately lost his life after returning from a botanical excursion at Sua, on the coast of Ecuador, January 24, 1846*.

Plate XVIII. Fig. 1, two flowers attached to the rhachis, and the cup-shaped bract which surrounds the calyx; 2, a flower; 3, a flower cut open; 4 and 5, anthers; 6 and 7, ovary; 8, ovary cut open; 9, pollen-masses:—*all magnified.*

EUPHORBIACEÆ.

(*Auctore F. Klotzsch.*)

Tribus I. Euphorbieæ, *Bartling.*

Euphorbia, *Linn. Gen. Pl. n.* 609.

Sectio 1. *Fruticuli aut herbæ diffusæ, procumbentes aut erectæ, dichotomæ; foliis oppositis, basi plerumque obliquis et rotundatis, sæpius orbiculatis vel ellipticis, interdum denticulatis; stipulis intrapetiolaribus; floribus axillaribus, subinde terminalibus aut alaribus, solitariis, interdum corymboso-conglomeratis.*

180. Euphorbia *callitrichoides,* H. B. K., Nov. Gen. et Sp. Pl. vol. ii. p. 42.—Herb. Willd. n. 9278. fol. 2. In sunny places, Province of Panama.

181. Euphorbia *hypericifolia,* Linn., Willd. Sp. Pl. vol. ii. p. 895.—Lam. Dict. vol. ii. p. 422. Panama.

182. Euphorbia *pilulifera,* Linn., Willd. Sp. Pl. vol. ii. p. 897.—*E. capitata,* Lam. Dict. vol. ii. p. 422. n. 31.—*E. indica,* Lam. Dict. vol. ii. p. 423. n. 34. In plantations; common all over the country.

Sectio 2. *Herbæ erectæ, dichotomæ; foliis oppositis, petiolatis, oblongis, basi æqualibus, integerrimis; stipulis ad basin petiolorum glandulæformibus, truncatis; floribus solitariis.*

183. Euphorbia *picta,* Jacq., Icon. Rar. t. 477. collect. 3. p. 178.—Willd. Sp. Pl. vol. ii. p. 896. n. 76. Veraguas.

Sectio 3. *Herbæ erectæ, dichotomæ; foliis oppositis, petiolatis, oblongis, basi æqualibus, integerrimis; stipulis nullis; pedunculis dichotomis.*

184. Euphorbia *graminea,* Linn. Willd. Sp. Pl. vol. ii. p. 900. n. 59. Volcano of Chiriqui, Veraguas.

Sectio 4. *Fruticuli inermes, erecti, glabri, apice di- vel trichotomi; foliis ternis, integerrimis; floribus alaribus, axillaribus vel terminalibus, paucis.*

185. Euphorbia *apocynoides,* Kl. MSS.; fruticulosa, inermis, inferne di- superne trichotoma, glabra; ramis ramulisque teretibus; foliis ternis, petiolatis, oblongo-obovatis, obtusis, basi attenuatis, penninerviis, integerrimis, subtus glaucescentibus; floribus axillaribus, alaribus et lateralibus, paucis, brevipedicellatis; involucris cyathiformibus, quinquefidis, albidis. Punta de Garachine, Province of Panama.

* See biographical sketches of Edmonston in Seemann's 'Narrative of the Voyage of H.M.S. Herald,' vol. i. p. 67, Seemann's 'Reise um die Welt,' Band i. s. 71, and 'Bonplandia,' vol. i. p. 4.

A shrub from 4 to 6 feet high. *Branches* di- or trichotomous, roundish, smooth, articulated above the whorls of the leaves; articulations easily separable. *Leaves* three in a whorl, elongato-obovate, rounded at the apex, attenuated at the base; upper surface light green, under surface somewhat glaucous, smooth on both sides, membranaceous, penninerved, 2–2½ inches long, 6–10 lines broad. *Petioles* slender, 3–4 lines long, somewhat pubescent above, always glabrous beneath.

The specimen before me is rather imperfect, and although I have no doubt it belongs to a new species, yet I am unable to say anything about the real structure of the flower; I find only one involucrum, in which even the female apparatus is wholly wanting. This involucrum is slightly pubescent, of a cup-shaped form, divided into five obtuse lobes, on a pedicel 1 line in length, and measures about 1½ line in diameter.

Sectio 5. *Herbæ interdum suffruticosæ, erectæ; foliis alternis, denticulatis; floribus terminalibus, umbellatis.*

186. Euphorbia *Morisoniana*, Kl. MSS.; herbacea, erecta; caulibus teretibus, sparsim articulato-pilosis; pilis basi tuberculatim incrassatis; foliis difformibus versus marginem brevi-hirsutis, inferioribus remotis lato-linearibus acutis basi subinde dentatis, superioribus aggregatis, jaculi uncinati instar dentibus magnis duobus incurvis infra medium plerumque auctis; petiolis dense articulato-pilosis; floribus terminalibus, subumbellatis; capsulis glabris, lævibus. "Tithymalus curassavicus, Salicis et Atriplicis foliis hirsutis, caulibus subrubentibus," *Morison, Pl. Hist. v.* 3. *p.* 336. "Tithymalus indicus, Salicis et Atriplicis brevioribus longioribusque," *Breynii Prodromus, v.* 1. *p.* 102. Volcano of Chiriqui, Veraguas.

An erect, perhaps biennal plant, from 12 to 16 inches high, simple-branched. *Branches* straight, slender, proceeding from below. *Leaves* distant, broad-linear, narrowed at both ends, and covered near the margin with very short stiff hairs, hirsute on the under surface, 1½–3 inches long, 1–3 lines broad; upper ones frequently furnished below the middle with one or two large teeth. *Petioles* 4 lines long, covered with long articulated hairs. *Inflorescence* terminal, capitate. *Involucre* campanulate, shortly pedicellated, smooth, obscurely four-toothed; teeth beautifully fringed. *Style* tripartite; stigmas shortly bifid. *Fruit* glabrous, consisting of three monospermous cocci.

On comparing the descriptions by the above-mentioned authors with the figures given by Plukenet and Plumier, all referred by Linnæus to his *Euphorbia heterophylla*, I find them differing from each other so widely in every respect, that I am convinced that the descriptions of Breynius and Morison refer to the plant collected by Berthold Seemann, while the figures published by Plukenet and Plumier belong solely to the true *Euphorbia heterophylla* of Linnæus.

187. Dalechampia *scandens*, Linn. Sp. Pl. vol. i. p. 1054. Common in savanas near Panama.

Tribus II. Hippomaneæ, *Bartling*.

188. Hura *crepitans*, Linn., Willd. Sp. Pl. vol. iv. p. 592.—Nomen vernacul. "Javillo." Very common all over the country.

"The seeds are used as a purgative."—*B. S.*

189. Hippomane *Mancinella*, Linn., Jacq. Am. p. 250. t. 159.—Willd. Sp. Pl. vol. iv. p. 571.—Nomen vernacul. "Manzanillo de playa." Common on the sandy sea-shores of both the Pacific and Atlantic side of the Isthmus.

189*. Sapium *Zelayense*, Kunth in Humb. et Bonpl. Nov. Gen. et Sp. Pl. vol. ii. p. 65. In savanas; Volcano of Chiriqui, Veraguas.

190. Sapium *Moritzianum*, Kl. MSS.; arboreum, glabrum; ramis ramulisque teretibus cine-

reis; foliis oblongis, utrinque brevi-attenuatis, apice obtuso-uncinatis, margine dentato-serratis recurvis, in apice petioli glandulis duabus stipitatis erectis; spicis in apice ramulorum terminalibus solitariis; floribus flavidis, superioribus masculis subcongestis, inferioribus fœmineis distantibus.—Nomen vernacul. "Olivo." In the southern parts of the Province of Panama.

A tree 30 feet high, with smooth grey branches. The leaves strongly resemble those of some Willows; they are of an oblong, somewhat lanceolate form, finely serrulated at the margin, a little narrowed at both ends, hooked at the obtuse apex in an incurved manner, and 3–5 inches long by 6–12 lines broad. *Petioles* 4–8 lines long, furnished at the ends with two opposite stalked glands. *Spikes* generally 4 inches long, terminal, bearing flowers of both sexes; upper part of the spike densely covered with male flowers of a yellowish colour, arranged in clusters of seven to twelve small flowers, each containing two stamens, surrounded by a membranaceous, two-cleft, globular calyx; each cluster supported by an ovate fringed scale, several hair-like appendices, and below these with two brown, sessile, panel-shaped glands. The under part of the spike bears from six to eight distant, solitary, female flowers, each with a two-leaved membranaceous calyx, and a globular, dark green, trilocular germen, crowned with a sessile, whitish, obtusely and shortly three-lobed stigma. The female flowers, like the male clusters, are supported by an ovate scale, several hair-like appendices, and two small, oblong, whitish glands.

Tribus III. Acalypheæ, *Bartling*.

191. Omphalea *diandra*, Linn., var. *Panamensis*, Kl.; ramulis crassiusculis evanescente ochraceo-pubescentibus; foliis oblongis brevi obtusoque acutis, margine obsolete subrepandis, coriaceis glabris saturate viridibus ad basin biglandulosis petiolatis bistipulatis; paniculis extra-axillaribus pedunculatis pubescentibus, bracteis spathulato-linearibus basi biglandulosis purpurascentibus in petiolum longum attenuatis persistentibus instructis. Island of Coyba, coast of Veraguas.

Although the habit of the specimen before me seems to be very different from that of *Omphalea diandra*, Linn., still I think it better to consider it as a variety, than as a new species; for on comparing several specimens of *O. diandra* from different localities, I find a great variation in the form of the leaves, especially at their bases, notwithstanding they differ in the proportion between the length and breadth of the leaves, and the margin is always entire: the leaves of the var. *Panamensis* are 4–5 inches long and only half as broad, while those of the true *O. diandra* are 5–6 inches long and 3½–4 inches broad.

192. Acalypha *Panamensis*, Kl. MSS.; fruticosa, subglabra; ramis strictis tenuibus lignosis teretibus evanescente pilosis; foliis membranaceis ellipticis, basi obtusis aut leviter emarginatis, apice acuminatis, margine serratis, versus basin integerrimis, supra glaberrimis, subtus nervoso-pilosis; stipulis obliquo-lanceolato-subulatis plus minusve pubescentibus; petiolis pilosis; spicis androgynis axillaribus, solitariis aut binis, folio quintuplo brevioribus; floribus masculis minutis pubescentibus dense spiraliter conglomeratis quadripartitis 6–8-andris, fœmineis basilaribus paucis sessilibus bractea involucrata obtuso 5-crenata carnosa calyceque acuto 3-fido hirto instructis; stigmatibus 3 tenue laciniatis, extus inferneque setosis. In dark forests near Cruces, Province of Panama.

A shrub from 10 to 12 feet high. Branches erect; petioles half an inch long; leaves from 4 to 6 inches long, and 1½ to 2½ inches broad; spikes remote, 1 inch long, and towards the apex as thick as the quill of a raven.—This species is allied to *Acalypha leptostachya*, H. B. K., from Turbaco, *A. betuloides*, Herb. Ruiz., from Peru, *A. Billbergiana*, Kl. (Tragiæ sp. nov., *Billberg, n.* 226), from Portobelo, *A. samydæfolia*, Pœpp. et Endl., from the Amazon, *A. carpinifolia*, Pœpp. Herb. n. 1307, from Peru, and *A. spicigera*, Kl. (Boehmeria spicigera, *Sprengl. Herb. Balb. n.* 2308), from Santamarta; from all of which however it differs in many essential points.

193. Acalypha *Seemanni*, Kl. MSS.; fruticosa, ramis petiolisque angularibus evanescente hirsutis; foliis magnis membranaceis cordato-ovatis acuminatis grosse serratis, supra præsertim in nervis hispidis, subtus hirtis; spicis hirsutis unisexualibus axillaribus solitariis folio brevioribus, superioribus fœmineis gracilibus, inferioribus masculis robustis; floribus masculis dense spiraliter conglomeratis hirtis quadripartitis 6–8-andris, fœmineis remotis sessilibus involucro bracteato hirsuto inciso instructis; calyce parvo glabro tripartito; stigmatibus superne tenue laciniatis versus basin setosis. In woods near the village of Cruces, Province of Panama.

A shrub from 8 to 10 feet high. Branches angular, furrowed, and hirsute. Lamina of the leaves from 4 to 7 inches long, and from 2 to 4 inches broad; petiole hirsute, 1–8 inches long. Male spikes on short stalks, 3 inches long and as thick as a goose-quill; female spikes much shorter than the male ones, and thrice thinner.—This species is allied to *A. mollissima*, Kl., from Peru, *A. caudata*, H. B. K., from New Granada, and *A. Schiedeana*, Schlecht., and *A. mollis*, H. B. K., from Mexico.

194. Acalypha *alopecuroidea*, Jacquin, var. *glandulifera*, Kl. MSS.; caule ramis petiolis et involucris hispido-glanduliferis; foliorum pagina inferiore nervoso-puberula. In waste places in and near the city of Panama.

While the specimens of this species, collected by Jacquin and by Humboldt and Bonpland in Venezuela, have only occasionally glands at the ends of the hairs, the hairs of the specimens just described are invariably glanduliferous. Still I should not have considered this peculiarity sufficient to found a new variety upon, had it not been coupled with another; viz. the nerves of the underside of the wild specimens from Venezuela, to which I have alluded, as well as some cultivated in the Botanic Garden at Berlin, are always covered with very stiff hairs, while in the specimens from Panama they are only slightly pubescent.

Tribus IV. Crotoneæ, *Blume*.

195. Mabea *Piriri*, Aubl. l. c. p. 867. t. 334, fig. 1. Savanas, near Panama.

196. Jatropha *podagrica*, Hook. Bot. Mag. t. 4376.—Wlprs. Ann. vol. iii. p. 368. Cultivated in gardens on account of its beautiful scarlet flowers.

"By mistake it was stated in the 'Botanical Magazine' that Purdie introduced this plant from Santamarta, whilst it was I who first sent living specimens of this species to the Royal Botanic Gardens at Kew, whence they were distributed among various horticultural establishments."—*B. S.*

197. Jatropha *elegans*, Kl. MSS.—*Adenorhopium elegans*, Pohl, Plant. Brasil. vol. i. p. 16.—Nomen vernacul. "Frailecillo." Very common on roadsides and waste places; used as a purgative.

This plant, which is used in the Isthmus as a purgative, bears a great resemblance to *Jatropha gossypifolia*, Linn., for which it is commonly mistaken. The late Dr. Pohl, of Vienna, was the first who distinguished it under the name above quoted, pointing out the absence of down. It is found in the West Indies and in most tropical regions of the South American continent, while the true *J. gossypifolia* of Linnæus appears to be confined to the West Indian Islands, and is only met with in a cultivated state on the western coast of Africa; at least I find that in all cases, where the contrary has been stated, *J. elegans* has been mistaken for *J. gossypifolia*.

198. Curcas *purgans*, Medicus, Index Plant. horti Manhemiensis, vol. i. p. 90.—Nomen vernacul. "Coquillo." Common all over the country.

"This shrub is used for making hedges, and its fruit as a purgative."—*B. S.*

199. Cnidoscolus *napæfolius*, Pohl, Plant. Brasil. vol. i. p. 57.—*Jatropha napæifolia*, Desrousseaux.—Nomen vernacul. "Col de Nicaragua." Near dwellings and in gardens; naturalized.

"This shrub is used for making hedges, and its leaves are boiled and eaten."—*B. S.*

200. Cnidoscolus *Marcgravii*, Pohl, l. c. p. 56. On roadsides, common.

201. Manihot *Aipi*, Pohl, Plant. Brasil. vol. i. p. 30.—Nomen vernacul. "Yuca." Extensively cultivated; but the tubers are only eaten as a vegetable.

202. Ricinus *communis*, Linn. Hort. Cliff. p. 450.—Nomen vernacul. "Higuerilla." Very common on roadsides and waste places.

203. Croton *Eluteria*, Swartz, Fl. Ind. Occ. p. 1183. Klotzsch in Heyne's Arzneigewächse, vol. xiv. p. 1. t. 1.—Nomen vernacul. "Corpachi," seu "Colpachi." In dark forests of Western Veraguas.

"The bark of this tree is used as a remedy for toothache."—*B. S.*

204. Caperonia *castaneæfolia*, A. St. Hilaire, in Mém. du Mus. vol. xii. p. 343. In swamps, city of Panama.

205. Caperonia *Panamensis*, Kl. MSS.; caule ramisque herbaceis adpresse setulosis; foliis lanceolato-linearibus acutis paucinervosis remote serrulatis, supra pallide viridibus, subtus purpurascentibus, nervis prominentibus, setulis remotis adspersis; petiolis hirsutis; spicis axillaribus sparsim hirsutis, folio duplo triplove brevioribus. In swamps, near the city of Panama.

This species differs from the foregoing in the stem and branches being destitute of stalked glands, in the smaller leaves with fewer nerves and less distinct serrature, and in the spikes being half the length of the leaves.

206. Astræa *Seemanni*, Kl. MSS.; caule herbaceo erecto tereti subglabro, apice in ramos verticillatos striato-angulatos sparse stellatim pilosos diviso; foliis longe petiolatis profunde 3–4–5-lobatis undique sparsim hirsutis, basi truncatis, lobis oblongis, basi brevi-attenuatis acuminatis pauci obtusoque inciso-serratis; petiolis pedunculis pedicellisque evanescente stellato-pilosis; spicis axillaribus, folio sublongioribus; calycibus florum fœmineorum sparsim hirsutis, capsulis sparsissime parvique stellatim pilosis duplo brevioribus. Near Panama.

When I first established *Astræa* upon *Croton lobatus*, Linn., in the year 1841, I was only acquainted with eight species belonging to this genus; since that time they have increased to not less than twenty-two. Specimens of all of them are preserved in the Royal Herbarium at Berlin.

Among the plants sold by the Unio Itineraria, and collected by Kotschy in Nubia, on the hills of Cordofan, we find, under no. 85, specimens labelled *Croton lobatus*, totally different from the Linnæan species; another distinct one, found on the west coast of Africa in several localities, is also figured under the same name by Palisot-Beauvois in the 'Flore d'Oware et de Benin;' and though the real *Croton lobatus*, Linn., is not only found in Mexico and in the West Indian Islands, but also in New Granada, Venezuela, Ecuador, and Brazil, I observed four other quite distinct species in different sets of dried plants sent to me for examination, all as nearly related to *Croton lobatus*, Linn., as *Astræa Seemanni*. The geographical distribution of the species of *Astræa* appears to be very remarkable:—one species is found in Nubia, another on the west coast of Africa, two species in Mexico, one in the West Indies, one in Central America, one in the West Indies and South America, and fifteen species in Brazil.

Barhamia*, Kl. MSS. *Flores* monoici, bracteati, in spicas subterminales longiusculas collocati, superiores masculi congesti, inferiores fœminei sparsi. Masc. *Bracteæ* parvæ, persistentes, unifloræ. *Calyx* pedicellatus, globosus, 5-partitus, deinde apertus, coloratus, extus præsertim versus basin stellato-hirtus, laciniis petalis foliisque minutissime pellucido-punctatis, æstivatione imbricativa. *Corollæ* petala 5, calycis laciniis alterna et angustiora, æstivatione convolutiva. *Stamina* 10–12, exserta, centro disci quinquelobi inserta; filamentis liberis pilosis, æstivatione inflexis, demum erectis; antheris connecticulis ovalibus magnis instructis basi affixis bilocularibus, loculis antice per rimam longitudinalem dehiscentibus. *Disci* lobi rotundati, plani, carnosuli, petalis alterni. Fœm. *Calyx* campanulatus, profunde quinquefidus, stellato-hirsutus, æqualis, laciniis plerumque glanduloso-fimbriatis. *Petala* nulla. *Discus* hypogynus anguste quinquelobus, lobis oblongis truncatis calycis laciniis oppositis. *Germen* globosum, trigonum, stellato-hirsutum, triloculare, loculis uniovulatis. *Styli* stigmatosi, tres profunde quadripartiti, filiformes, involuti. *Capsula* tricocca, coccis bivalvibus monospermis. *Semina* oblonga, obtuse trigona, glabra, lævia.—Suffrutices *Americæ meridionalis;* foliis *alternis integris serratis longe petiolatis plus minusve stellato-hispidis bistipulatis;* stipulis *pedicelliformibus glanduliferis;* spicis *in apice ramulorum solitariis vel plurimis.*

This new genus differs from *Astræa* in the male flowers growing singly from the axil of a bractea, and in the female flowers having deeply quadripartite styles and quite smooth seeds. From *Croton* it is easily distinguished by the absence of petals and by the more deeply parted styles in the female flowers. I only know seven species: *Barhamia hispida* (Croton hispidus, *Kth.*), *B. macrostachya* (Richard Schomburgk, no. 382), *B. Essequiboensis* (Croton Essequiboensis, *Kl.*), *B. urticæfolia* (Croton urticæfolium, *Lam.*), *C. multispicatus* (Velloz. x. t. 75), *B. ovalifolia* (Croton ovalifolium, *Wlprs.*), and *B. Panamensis.*

207. Barhamia *Panamensis*, Kl. MSS.; caule suffruticoso tereti erecto dichotomo ramoso sparse stellatim applanato piloso deinde glabro; foliis longe petiolatis alternis ovatis acutis, sparse adpresseque stellatim pilosis, cordatis inæqualiter grosse serratis, dentibus ovatis obtusis mucronatis; stipulis pedicelliformibus medio apiceque glanduliferis; spicis in apice ramorum solitariis binis vel ternis, pedunculatis, stellatim pubescentibus; bracteis parvis ovatis inciso-glandulosis; laciniis calycis fœminei ovato-lanceolatis uninerviis margine inciso-glandulosis. Near Natá, Province of Panama.

A half-shrubby plant, a foot and more high. Leaves 2–3 inches long and 1–2 inches broad; spikes from 3–4 inches long.

The species above characterized is very nearly related to *Croton hispidus*, Kth.; it differs from that however in being less downy, the leaves being shorter-pointed, and the serrature very unequal; the lobes of the female calyx are also much narrower than those of *Croton hispidus.*

Cyclostigma†, Kl. MSS.—Crotonis species, Auct. *Flores* monoici, longissime spicati, masculi et fœminei usque a basi ad apicem fasciculatim intermixti, fasciculis plurifloris bractea decidua suffultis. Masc. *Calyx* globosus, deinde magis apertus, pedicellatus, quinquefidus, foliaceus, æstivatione imbricativa. *Corollæ* petala quinque, membranacea, margine villosa, calycis laciniis alterna, æstivatione convolutiva. *Discus* pilosus, quinqueradiatus, radiis apice truncatis glandulæformibus petalis alternis. *Stamina* 15 disco imposita, filamentis liberis glabris, æstivatione inflexis, demum erectis exsertis; antheris connecticulis ovalibus magnis instructis, bilocularibus, basi affixis, loculis

* In commemoration of the late Henry Barham, author of the 'Hortus Americanus,' containing an account of the trees, etc., particularly of the island of Jamaica (1 vol. 8vo, Kingston, Jamaica, 1794).

† Name from κυκλος, a circle, and στιγμα, in allusion to the circular stigmas.

antice per rimam longitudinalem dehiscentibus. Fœm. *Calyx* profunde quinquefidus globosus, herbaceus, æqualis, laciniis ovalibus subobtusis. *Petala* nulla eorum loco glandulas pedicellatas quinque inter lobos disci hypogyni insertæ adsunt; radii disci applanati suborbiculares remoti crenulati. *Germen* globosum, obtuse trigonum, triloculare, loculis uniovulatis. *Styli* tres distincti, profunde bipartiti, lobis planiusculis, extus versus apicem sulcatis tortilibus. *Capsula* tricocca, coccis bivalvibus monospermis. *Semina* brevi oblonga, subtrigona, radiatim rugosa.—Arbusculæ *Americæ meridionalis, exceptione loborum disci, staminum atque stylorum dense stellatim tomentosæ;* foliis *alternis longe petiolatis deciduo-stipulatis magnis plus minusve cordatis subinde lobatis, dorso ad basin biglandulosis;* spicis *robustis longissimis terminalibus.*

This newly-established genus comprises at present only six species. One, *C. abutiloides* (Croton abutiloides, *Kth.*), is a native of Peru; another, *C. hibiscifolium* (Croton hibiscifolius, *Kth.*), is found in New Granada; two, *C. xalapense* (Croton xalapensis, *Kth.*) and *C. Draco* (Croton Draco de *Schlecht.*), have been collected in Mexico; and two other hitherto undescribed ones were discovered by B. Seemann at Panama. The character of the genus is very easily understood by the flowers of both sexes being mixed together in clusters along the whole spike, which is robust and very long; and in the female flowers, instead of petals, there appear long stalked glands; the three styles are, besides, deeply bipartite, linear, and pointed.

208. Cyclostigma *Panamense,* Kl. MSS.; ramis stellatim furfuraceo-floccosis; foliis ovatis cordatis anguste acuminatis obsolete denticulatis, supra scabriusculis, subtus molliter tomentosis, nervis utrinque 7–9 lateralibus instructis; glandulis patellæformibus umbonatis; stipulis crassis teretiusculis brevibus obtusis deciduis; florum fasciculis remotis; bracteis perbrevibus; germinibus ochraceis strigosis.—Nomen vernacul. "Sangrillo." Volcano of Chiriqui, Veraguas.

The leaves are 6–9 inches long, and 4–6 inches broad, on the upper surface of a lively green, somewhat scabrous; on the under surface covered with a rather white furfuraceous tomentum. The glands at the base of the leaves are sessile, of a cartilaginous texture, and yellowish-white. The spikes are about nine inches long, and as thick as a crow's quill.

209. Cyclostigma *denticulatum,* Kl. MSS.; ramulis petiolis spicisque tenue stellatim-pubescentibus; foliis membranaceis late ovatis profunde cordatis, apice brevi attenuatis, margine distincte denticulatis, supra scabrido-pubescentibus, subtus tenue incano-tomentosis, nervis utrinque 5–6 lateralibus instructis; glandulis patellæformibus umbilicatis; stipulis planis lanceolatis caducis; spicis folio brevioribus; bracteis brevissimis. Panama.

A middle-sized tree. Leaves membranaceous, 4–5 inches long and as many broad, dark-green above and glaucous beneath. Petioles 5 inches long. Spike rather thin and somewhat angular, 5 inches long.

Tribus V. Phyllantheæ, *Endlicher.*

210. Phyllanthus *diffusus,* Kl. MSS.; suffruticosus, virgatim ramosissimus; ramis ramulisque atro-fuscis opacis tenuibus glabris; foliis minutis crebris obovatis brevi apiculatis; stipulis parvis lanceolato-subulatis persistentibus; floribus masculis et fœmineis in apice ramulorum binis ternisve axillaribus, masculis 5-fidis triandris, staminibus minutis inclusis monadelphis, fœmineis trigynis, stigmatibus bidentatis, dentibus divaricatis. In swamps near Panama.

A half-shrubby plant, a foot and a half high. Stem divided into long slender branches of a dark brownish colour, and these again beset with very short branches; all covered with very small leaves of an obovate somewhat apiculated form, 1½ line long and 1 line broad. Calyx of the flowers of both sexes five-

cleft; segments unequal, oblong, obtuse, marked with a white margin.—From *Phyllanthus microphyllus*, Kth., and *P. Niruri*, Linn., it differs in the form of the leaves and the erect branches; from *P. obovatus*, Linn., in the larger size of the plant and the smallness of the leaves.

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211. *Euphorbiacearum* Gen. nov.—Nomen vernacul. "Zapatero." Village of Tole, Veraguas.

As there are only specimens with male flowers in the collection, I do not know to which tribe of *Euphorbiaceæ* this tree belongs, and I think it is desirable not to publish the name and diagnosis of this new genus until female flowers have been procured.

ANACARDIEÆ.

212. Anacardium *occidentale*, Linn., De Cand. Prodr. vol. ii. p. 62.—Nomen vernacul. "Marañon." Common in the savanas throughout the country, and also cultivated in many parts; Chagres (Fendler, no. 308).

The fleshy peduncles of this tree are eaten as a dessert-fruit; the seeds, which, after having been roasted and sugared, taste very much like almonds, are likewise brought to table.

213. Rhinocarpus *excelsa*, Bert., De Cand. Prodr. vol. ii. p. 62.—Nomen vernacul. "Espave." Very common in all the woods of the Isthmus, especially near the rivers and rivulets; Libertad (Barclay).

This tree is one of the largest in the country. The wood, being tough and durable, is employed for making canoes and different household articles; the bark is said to be used for stupefying fish; the fruit, like that of the Marañon, is eaten.

214. Mangifera *Indica*, Linn., De Cand. Prodr. vol. ii. p. 63.—Nomen vernacul. "Mango." Extensively cultivated on account of its edible fruit.

215. Spondias *purpurea*, Linn., De Cand. Prodr. vol. ii. p. 75.—"Ciruelo." Common in the savanas, and also cultivated in gardens.

There are several varieties of this species cultivated, the three most common of which are respectively called *Ciruelo de puerco*, *Ciruelo de San Juan*, and *Ciruelo de Nicoya*; the latter has by far the largest leaves and fruit of any I know. Perhaps a closer study of these supposed variations in a living state might prove that they are species, but as the leaves, flowers, and fruit vary extremely, I think that without very good materials nothing can be done towards settling this point.—The Ciruelos, or, as they are termed in the West Indies, Hog Plum-trees, are used for making fences; their fruit is eaten.

216. Spondias *lutea*, Linn., De Cand. Prodr. vol. ii. p. 75.—*Spondias graveolens*, M'Fadyen, Fl. Jamaic. vol. i. p. 228.—Nomen vernacul. "Jobo" vel "Hobo." Cultivated on account of its edible fruit, and naturalized in some parts of the country; Chagres (Fendler, no. 141).

LEGUMINOSÆ*.

217. Lupinus *campestris*, Schlecht., Wlprs. Rep. vol. i. p. 600. Grassy slopes of the Volcano of Chiriqui, Veraguas.

* In determining the plants belonging to this Order, I have been greatly assisted by George Bentham, Esq., who indicated the new species to me, and also described some of them himself.

Corrected page.

This is not, as Schlechtendal supposes, a shrub, but a perennial herb, about 2½ feet high. Except that the stipules are not so long as those described by the author, my specimens agree well with Schlechtendal's diagnosis.

218. Crotalaria *pterocaulon*, Desv., De Cand. Prodr. vol. ii. p. 124.—*C. genistella*, H.B.K., De Cand. l. c. Volcano of Chiriqui, Veraguas.

219. Crotalaria *Maypurensis*, H.B.K., De Cand. Prodr. vol. ii. p. 132. Near the city of Panama.

220. Crotalaria *Guatemalensis*, Benth. Leg. Oerst. ined.; fruticosa, ramulis minute adpresse puberulis, stipulis minimis setaceis, foliolis ovato- v. oblongo-ellipticis utrinque acutis supra glabris subtus puberulis, racemis densifloris plerisque folio demum longioribus, bracteis setaceis pedicello subbrevioribus, calycis laciniis longe setaceo-acuminatis, carinæ rostro incurvo, legumine adpresse puberulo. In cleared places, Cerro de Ancon, near the city of Panama.

A shrub, from 3 to 5 feet high; differs from *C. anagyroides*, H.B.K. (C. Brownei, *Bert.*), in the branches being divaricated, the bracts short, the flowers smaller, and the pods hardly an inch long.

221. Indigofera *pascuorum*, Benth., Wlprs. Rep. vol. i. p. 670.—*I. heterophylla*, Presl?—Nomen vernacul. "Yerba de savana." In savanas near Panama.

222. Indigofera *Anil*, Linn., var. *polyphylla*, De Cand. Prodr. vol. ii. p. 225.—Nomen vernacul. "Añil silvestre." Common on roadsides and waste places.

223. Indigofera *mucronata*, Sprengl., De Cand. Prodr. vol. ii. p. 227.—*I. lespedezioides*, Hook. et Arn. Bot. Beech. p. 415 (non H.B.K.), secundum Benth. Near Panama.

224. Tephrosia (Reineria) *nitens*, Benth. MSS. (Tab. XIX.); erecta, foliolis 7–9 oblongis obtusis retusisve recurvo-mucronatis supra glabris subtus ramulisque argenteo-villosis, stipulis bracteisque ovato-lanceolatis, racemis elongatis rigidis, pedicellis fasciculatis calyce sublongioribus, calycis laciniis tubo paullo longioribus infima vix longiore, vexillo sericeo-villoso, legumine juniore sericeo demum ferrugineo-villoso intus continuo.—*Stamen* vexillare ima basi liberum, dein cum cæteris in tubum completum connatum. *Stylus* intus barbatus.—Island of Taboga, Bay of Panama.

A shrub from 2 to 3 feet high; flowers of a fine rose-colour. It was also collected by Spruce in Brazil, where it is called Ajari, and is used for poisoning fish.

Plate XIX. Fig. 1, an entire flower; 2, vexillum; 3, one of the alæ; 4, carina; 5, stamens and pistil; 6, ovary:—*all magnified.*

225. Tephrosia *toxicaria*, Benth. Bot. Sulph. p. 80. Santiago de Veraguas.

"This is *Tephrosia toxicaria* of Bot. Beech. and of Bot. Sulph.," writes Mr. Bentham, "but not exactly the same as the West Indian and Guiana one, which I have also from Panama; there are differences in the calyx and pod, and I suspect that three species have been confounded under this name, and I know not which is the original one."

226. Lennea *viridiflora*, Seem.; foliis impari-pinnatis, foliolis 4–6-jugis ovato-oblongis v. oblongis emarginatis utrinque sparse puberulis, racemis axillaribus, ramulis, petiolis, bracteis rachidibus calycibusque rufo-tomentellis, floribus majusculis viridescentibus.—*Arbuscula* 10–12-ped.—Nomen vernacul. "Frijolillo." Santiago de Veraguas.

227. Sabinea *florida*, De Cand. Prodr. vol. ii. p. 263, var. *foliolis tenuioribus*, Benth. MSS. Veraguas.

228. Sesbania *macrocarpa*, Mühl., De Cand. Prodr. vol. ii. p. 265. Near Panama.

229. Diphysa *Carthaginensis*, Jacq., De Cand. Prodr. vol. ii. p. 269.—Nomina vernacul. "Macano" et "Cacique." Common in Panama and Veraguas.

The wood of this tree is used for building purposes, and yields a yellow dye. Mr. Bentham, in a note to me, remarks, "Your specimen appears to be the true plant; Coulter's specimens from Zinapan, and Galeotti's and Linden's from Veracruz, belong to distinct species."

230. Stylosanthes *humilis*, H.B.K.; diffusa v. adscendens, ramis linea pubescente notatis, foliolis oblongis lanceolatisve mucronato-acutis, spicis ovatis, flore stipitiformi nullo, legumine lato costato longe aristato-uncinato glabro v. hispidulo.—Var. *angustifolia*, Benth. Bot. Sulph. p. 82, foliolis lineari-lanceolatis. Savanas about Panama.

231. Stylosanthes *Guianensis*, Swartz, De Cand. Prodr. vol. ii. p. 318. Savanas of Panama and Veraguas.

232. Arachis *hypogæa*, Linn., Wlprs. Rep. vol. i. p. 727.—Nomen vernacul. "Mani." Cultivated on account of its edible seeds.

233. Planarium *latisiliquum*, Desv., Benth. Bot. Sulph. p. 81. t. 30. Hacienda de Cocoli, Province of Panama.

234. Zornia *pubescens*, H.B.K., De Cand. Prodr. vol. ii. p. 317. In savanas, Panama.

235. Æschynomene *sensitiva*, Swartz, De Cand. Prodr. vol. ii. p. 320. Swamps near Panama.

236. Æschynomene *glandulosa*, Poir., De Cand. Prodr. vol. i. p. 321. In sunny places on the banks of rivulets, Panama.

237. Æschynomene *conferta*, Benth., Wlprs. Rep. vol. i. p. 734. In savanas near Panama.

238. Desmodium *barbatum*, Benth. MSS.—*Nicolsonia barbata*, De Cand. Prodr. vol. ii. p. 325.—*Hedysarum barbatum*, Linn. Spec. 1055. In savanas near Panama.

239. Desmodium *linearifolium*, De Cand. Prodr. vol. ii. p. 327. In savanas, Panama.

240. Desmodium *cajanifolium*, De Cand. Prodr. vol. ii. p. 331. Common in plantations.

Attains occasionally a height of 5 to 6 feet.

241. Desmodium *incanum*, De Cand. Prodr. vol. ii. p. 332. Common on roadsides.

242. Desmodium *molle*, De Cand. Prodr. vol. ii. p. 332. On rocks, old walls, and on the roofs of houses; common.

243. Centrosema *Plumieri*, Benth., Wlprs. Rep. vol. i. p. 753.—*Clitoria Plumieri*, Turp., De Cand. Prodr. vol. ii. p. 234. On the outskirts of woods near Panama.

244. Centrosema *angustifolium*, Benth., Wlprs. Rep. vol. i. p. 754.—*Centrosema longifolium*, Benth. l. c. fide Benth. in lit.—*Clitoria angustifolia*, H.B.K., De Cand. Prodr. vol. ii. p. 234. In sunny exposed situations; savanas near Panama and Island of Taboga.

245. Centrosema *Salzmanni*, Benth., Wlprs. Rep. vol. i. p. 755. Growing among brushwood, in hedges, etc., in Darien, Panama, and Veraguas.

246. Stenolobium *cæruleum*, Benth., Wlprs. Rep. vol. i. p. 759. Western Veraguas.

247. Stenolobium *brachycarpum*, Benth.; foliis villosis, caule petiolis calycibus leguminibusque pilis rufis hirsutissimis, calycis laciniis longe subulatis.—Var. *brachystachyum*, Benth. Leg. Oerst. ined.; pedunculo folio breviore nunc brevissimo apice paucifloro. On the slopes of hills, from Panama to Santiago de Veraguas.

According to Mr. Bentham, both varieties are found in many parts of tropical America. The flowers are of a deep blue colour.

248. Galactia *brevistyla*, Schlecht., Wlprs. Rep. vol. i. p. 762. In hedges, Panama; Central America (Sinclair).

249. Dioclea *Guianensis*, Benth., var. *villosior*, Benth. in Hook. Journ. of Bot. vol. ii. p. 60. Common all over the country.

This plant has been found besides in Guiana (Schomburgk), Trinidad (Schach), Essequibo (Schomburgk), and Panama (Sinclair).

250. Dioclea (Eudioclea) *Panamensis*, Duchass. et Wlprs. in Flora Ratisb. April 21, 1853, p. 229. River Pequeni; Chagres (Fendler); Panama (Duchassaing).

Allied to *D. reflexa*, Hook. fil., and *D. lasiocarpa*, Mart.

251. Canavalia *gladiata*, De Cand. Prodr. vol. ii. p. 404. Island of Taboga.

252. Canavalia *villosa*, Benth., Wlprs. Rep. vol. i. p. 766. Volcano of Chiriqui, Veraguas.

253. Mucuna *altissima*, De Cand. Prodr. vol. ii. p. 405.—Nomen vernacul. "Ojo del venado." On the outskirts of woods near Panama.

This species climbs the loftiest trees; and the peduncles, which are occasionally fourteen feet long, present a very curious appearance. In common with the following species, it is termed by the inhabitants Ojo del venado, because the seeds, which are used for making ink, bear some resemblance to the eyes of a deer.

254. Mucuna *urens*, De Cand. Prodr. vol. ii. p. 405.—Nomen vernacul. "Ojo del venado." On the outskirts of woods, Panama.

The flowers of this species, which make their appearance in October, November, and December, are of a bright yellow, while those of the preceding species are of a faint rose-colour.

255. Erythrina *rubinervia*, H. B. K., De Cand. Prodr. vol. ii. p. 412.—Nomen vernacul. "Palo santo." Volcano of Chiriqui, Veraguas.

There being only flowers and portions of the stem, and no leaves in my collection, I am not quite certain whether I am right in referring the Palo santo to *E. rubinervia*. Fendler sent a second species of *Erythrina* from Chagres.

256. Phaseolus *lunatus*, Linn., De Cand. Prodr. vol. ii. p. 393.—Nomen vernacul. "Haba del monte." Very common all over the country, and ascending to an elevation of 3500 feet.

257. Phaseolus *gracilis*, Pœpp., Wlprs. Rep. vol. i. p. 775. On savanas about Panama.

258. Vigna *carinalis*, Benth., Wlprs. Rep. vol. i. p. 538. Near the city of Panama.

259. Pachyrhizus *angulatus*, A. Rich., Wlprs. Rep. vol. i. p. 781. Panama.

Walpers and Duchassaing believe that this species may be only cultivated in the Isthmus, but it is perfectly wild.

260. Cajanus *Indicus*, Sprengl. Syst. Veg. vol. iii. p. 782.—*C. flavus*, De Cand. Prodr. vol. ii. p. 406.—Nomina vernacul. "Guandu" et "Frijol del palo." Cultivated in fields on account of its edible beans.

261. Eriosema *lanceolatum*, Benth., Wlprs. Rep. vol. i. p. 784. Common in savanas.

There are two very broad-leaved forms of this variable species.

262. Eriosema *violaceum*, G. Don, Wlprs. Rep. vol. ii. p. 902.—*Rhynchosia violacea*, De Cand. Prodr. vol. ii. p. 388. Common in the savanas of Panama and Veraguas.

It has also been found in Surinam (Splitzgerber), Guiana (Schomburgk), and Trinidad (Lockhart).

263. Eriosema *diffusum*, G. Don, Wlprs. Rep. vol. ii. p. 902.—*Rhynchosia diffusa*, De Cand. l. c. Volcano of Chiriqui, Veraguas.

β. holosericeum, Benth. MSS.; foliolis latioribus, racemis dense capitatis. Volcano of Chiriqui, Veraguas.

264. Eriosema *crinitum*, G. Don, Wlprs. Rep. vol. ii. p. 902.—*Rhynchosia crinita*, De Cand. l. c. In savanas near Panama.

Hooker's Herbarium contains specimens of this plant, from Berbice (Schomburgk), Caracas (Lockhart), Brazil (Gardner), Surinam (Hostmann), Camperuchi (Purdie), and Panama (W. Lobb).

265. Rhynchosia *reticulata*, De Cand. Prodr. vol. ii. p. 385. Near Panama.

266. Rhynchosia *phaseoloides*, De Cand. Prodr. vol. ii. p. 385. Chagres (Fendler, no. 66).

267. Rhynchosia *precatoria*, De Cand. Prodr. vol. ii. p. 385.—*R. picta*, Seem. MSS. (Tab. XX.); caule volubili villoso, foliis rhombeo-ovatis acuminatis basi obtusis 3-nerviis pubescenti-mollibus, racemis axillaribus multifloris folia subæquantibus, leguminibus oblongis glanduloso-hirsutis. Volcano of Chiriqui, Veraguas; Island of Trinidad (Purdie).

This plant I thought at one time different from *R. precatoria*, De Cand., and so did Mr. Bentham, for which reason I called it *R. picta;* but now I find that it is identical with *R. precatoria*, and therefore abandon the name which I gave to it. *R. precatoria* is closely allied to, and often confounded with, *R. phaseoloides;* it may however at once be distinguished from that species by its pods, which, when fully matured, are still glanduloso-hirsute, while those of *R. phaseoloides* are in that state quite glabrous and shining. The flowers of *R. precatoria* are yellow, and the seeds, like those of its ally, half black and half scarlet.

Plate XX. Fig. 1, an entire flower; 2, vexillum; 3, one of the alæ; 4, carina; 5, stamens and pistil; 6, ovary and style; 7, ovary cut open; 8, a ripe pod; 9 and 10, seeds; 11 and 12, seeds cut open:—*all*, with the exception of no. 9, *magnified*.

268. Amerimnum *Brownei*, Swartz, De Cand. Prodr. vol. ii. p. 421. Common on the sea-side of the coasts of both the Atlantic and Pacific Oceans.

269. Drepanocarpus *microphyllus*, C. F. W. Meyer, De Cand. Prodr. vol. ii. p. 420.—Nomen vernacul. "Drago." Common in the vicinity of Panama; Island of Taboga.

270. Machærium *Seemanni*, Benth. Herb. MSS.; stipulis deciduis, foliolis 11–13 parvulis

ovatis obtusis basi rotundatis subcordatisve parce pilosis nitidulis venis tenuibus reticulatis, paniculis brevibus calycibusque ferrugineo-tomentosis, bracteolis orbiculatis appressis, petalis extus dense villosis, carina erostri vexillo breviore, legumine longe stipitato fusco-tomentoso. Volcano of Chiriqui, Veraguas.

A middle-sized tree. Leaves from 3 to 4 inches, leaflets nearly half an inch, and pods about 3 inches long.

271. Lonchocarpus *latifolius*, H. B. K., De Cand. Prodr. vol. ii. p. 260. Island of Coyba and Paredez Group, on the coast of Veraguas.

272. Lonchocarpus *longifolius*, Benth. MSS. in Herb. Hook. Banks of the river Nuqui, Darien.

Spruce collected this species at Barra, Province of Rio Negro, Brazil. It approaches closely to *L. violaceus*, but the leaves have no pellucid dots; the flowers are blue.

273. Lonchocarpus *velutinus*, Benth. MSS.; foliolis 7–9 ovali-oblongis breviter acuminatis margine recurvis utrinque molliter tomentosis, panicula ramosissima tomentosa, pedicellis medio articulatis 1–2-floris, calyce cyathiformi vexilloque tomentosis, alis carinaque æqualibus obtusis puberulis, staminibus monadelphis, ovario tomentoso medio biovulato.—Nomen vernacul. "Iguana." Near the village of San Carlos, Province of Panama.

A tree 30 feet high. Leaves about 6 inches long; leaflets from 2 to 3 inches long, and from three-fourths of an inch to one inch broad; flowers dark purple. Hind collected this species at Culebra.

274. Gliricidia *maculata*, Kunth, Synop. vol. iv. p. 80 in adnot.—*Lonchocarpus maculatus*, De Cand. Prodr. vol. ii. p. 260.—Nomina vernacul. "Bala" et "Madera negra." Common all over the country.

Employed for making hedges; the leaves are used for poisoning rats.

275. Platymiscium *polystachyum*, Benth. MSS. (Tab. XXI.); foliolis 3–5 ovatis breviter obtuse acuminatis, stipulis orbiculatis obtusis, racemis simplicibus, pedicellis calycem subæquantibus, vexillo orbiculato alas subæquante.—Nomen vernacul. "Quira." David, Province of Veraguas.

There are specimens of this species in fruit from Trinidad (Purdie), in Herb. Hook., with adult shining leaves. Mr. Bentham has also seen it from Santamarta (Bertero) and other localities. It is a fine tree, producing a beautiful hard wood, streaked black and red.

Plate XXI. Fig. 1, an entire flower; 2, vexillum; 3, one of the alæ; 4, carina; 5, calyx and stamens; 6, ovary and style:—*all magnified.*

276. Andira *inermis*, H. B. K., De Cand. Prodr. vol. ii. p. 475. On the banks of rivulets and rivers, Panama.

277. Ormosia *Panamensis*, Benth. MSS.; foliolis 5–7 elliptico-oblongis obtuse acuminatis basi angustato-rotundatis utrinque pilis adpressis puberulis, racemis simplicibus.—Nomen vernacul. "Peronil." Village of Remedios, Veraguas.

A tree fifty feet high; wood durable and used for building purposes; leaves about 1 foot long; the terminal leaflet 4 inches long, 1 inch broad. Flowers of a lilac colour.

278. Guilandina *Bonduc*, Ait., De Cand. Prodr. vol. ii. p. 480. Common on the sea-coast.

279. Cæsalpinia *pulcherrima,* Swartz, Obs. 166.—*Poinciana pulcherrima,* Linn., De Cand. Prodr. vol. ii. p. 484.—Nomina vernacul. "Gallito" et "Clavelina." Near dwellings and in waste places, also cultivated in gardens on account of the beauty of its flowers.

There are two varieties of this splendid shrub met with in the Isthmus, one bearing light yellow flowers, the other dark orange ones. I am inclined to believe that the species is not indigenous, but was introduced thither from the West Indies, where it is well known by the popular name of "Pride of Barbadoes." However, it is now perfectly wild in some parts of the country.

280. Cassia *alata,* Linn., Wlprs. Rep. vol. i. p. 816.—Nomen vernacul. "Laureño." On the banks of rivulets and in savanas.

The leaves of this plant are used as a purgative by the natives.

281. Cassia *occidentalis,* Linn., Wlprs. Rep. vol. i. p. 816.—Nomen vernacul. "Frijolillo." Common in waste places, near dwellings, growing in company of *Petiveria alliacea, Sida rhombifolia,* etc.

282. Cassia *maritima,* Willd., Wlprs. Rep. vol. i. p. 817. Hacienda de Cocoli, Province of Panama; scarce.

283. Cassia *picta,* G. Don, Wlprs. Rep. vol. i. p. 821. Hacienda de Cocoli, Province of Panama.

284. Cassia *pauciflora,* H. B. K., Wlprs. Rep. vol. i. p. 829. In savanas near the village of Santamaria, Province of Panama.

285. Cassia *diphylla,* Lam., Wlprs. Rep. vol. i. p. 831. In savanas near the city of Panama, and in the island of Taboga.

286. Cassia *Langsdorfii,* Kunth, Wlprs. Rep. vol. i. p. 831. In savanas near Panama.

287. Cassia *Kunthiana,* Cham. et Schlecht., Wlprs. Rep. vol. i. p. 832. In savanas near Panama.

288. Cassia *Brasiliana,* Lamarck, Wlprs. Rep. vol. i. p. 812.—Nomen vernacul. "Cañafistola." Common on roadsides and the outskirts of woods.

The pulp surrounding the seeds of this plant is eaten by the inhabitants.

289. Cassia *fistula,* Linn., Wlprs. Rep. vol. i. p. 812.—Nomen vernacul. "Cañafistola de purgar." On the outskirts of woods near the villages of Cruces, Araijan, and Capira.

The pulp of the fruit of this tree is used as a purgative.

290. Cassia *puberula,* H. B. K., Wlprs. Rep. vol. i. p. 814. In savanas, and on the outskirts of woods; common.

291. Cassia *viminea,* Linn., Wlprs. Rep. vol. i. p. 814. In savanas and on the outskirts of woods, generally growing with *C. puberula.*

292. Cassia *bicapsularis,* Linn., Wlprs. Rep. vol. i. p. 815. In sunny waste places; flowers throughout the year.

293. Swartzia *triphylla,* Willd., De Cand. Prodr. vol. ii. p. 423.—Nomen vernacul. "Naranjo de monte." Island of Taboga; and woods near Panama.

This tree produces excellent timber.

294. Swartzia *pinnata*, Willd., De Cand. Prodr. vol. ii. p. 423. Hacienda de Juan Lanas and village of San Juan, Province of Panama; also collected by Barclay in some place on the West Coast of America (Herb. Hook.).

My specimens, as well as those of Barclay of the same plant, do not quite agree with De Candolle's description; the peduncles are not velvety, but only slightly tomentose. My plant grows in dark forests, and is a tree about 35 feet high, the leaves are about 9 inches long, the racemes are in pairs, and the petals bright yellow. If I am not mistaken, it is vernacularly termed "Cutaro."

295. Brownea *Rosa*, Pers., De Cand. Prodr. vol. ii. p. 477. Bays of Ardita and Solano, Darien, and, according to De Candolle, at Portobelo, in the Province of Panama.

296. Tamarindus *Indica*, Linn., De Cand. Prodr. vol. ii. p. 488.—Nomen vernacul. "Tamarindo." Cultivated on account of its fruit.

297. Hymenæa *Courbaril*, Linn., De Cand. Prodr. vol. ii. p. 511.—Nomen vernacul. "Algarrobo." Common all over the country.

The wood of the Algarrobo is used for building purposes; the pulp of the fruit is eaten.

298. Bauhinia (§ Paulletia) *parvifolia*, Seem.; fruticosa, erecta, ramulis rufo-hirtellis demum glabris, spinis stipularibus rectis, foliis ovatis supra viridibus glabris subtus subglaucescentibus pubescentibus 8–9-nerviis $\frac{1}{4}$ bilobis, lobis obtusissimis, racemis terminalibus, petalis extus rufo-tomentellis, legumine glabro demum villoso. Panama viejo.

A shrub about 12 feet high. Leaves 1 inch long and about 10 lines broad; flowers 2 inches long; stalk of the pod 3 inches long, and the pod itself 6 to 7 inches long and three-quarters of an inch broad, when young glabrous, but gradually becoming villous.—This species has some affinity to *B. microphylla*, Vogel, and *B. corniculata*, Benth.; from the former it differs in its rufo-hirtellous branches and less deeply divided leaves; from the latter in its smaller leaves, and their obtuse lobes.

299. Bauhinia *inermis*, Pers., De Cand. Prodr. vol. ii. p. 514.—Nomen vernacul. "Cocla." On the outskirts of woods near Remedios, Veraguas.

300. Schnella *Columbiensis*, Benth. in Bot. Sulph. p. 89.—*Bauhinia Columbiensis*, Vogel, Wlprs. Rep. vol. i. p. 852. Mouth of the Rio Grande de Panama.

301. Schnella *splendens*, Benth. in Hook. Journ. of Bot. vol. ii. p. 97.—*Bauhinia splendens*, H. B. K., De Cand. Prodr. vol. ii. p. 516. In dark forests of the Island of Coyba and the Bay of Ardita.

302. Copaifera *officinalis*, Linn., De Cand. Prodr. vol. ii. p. 508; quoad plantam Jacquini, *C. Jacquini*, Desf. Village of Gualaca, Province of Veraguas (Warszewicz).

"The balsam of this tree," says M. de Warszewicz, in a letter to Daniel Hanbury, Esq., "is not exported from Veraguas. The inhabitants of the town of David and the neighbouring district collect it for painting with it their doors and window-frames, and use it medicinally; a wine-bottle full is sold there for from 4 to 5 reals (2*s.* to 2*s.* 6*d.*)."

303. Prosopis *dulcis*, Kunth, Wlprs. Rep. vol. i. p. 862.—*P. horrida*, H. B. K., De Cand.

Prodr. vol. ii. p. 446!—Nomen vernacul. "Mancacavallo." On the sandy shores of the Pacific Ocean.

304. Neptunia *pubescens*, Benth., Wlprs. Rep. vol. i. p. 863; var. *tenuis*, Benth. MSS. Puerto de Agua dulce, Province of Panama, in dry sunny places.

305. Neptunia *plena*, Benth., Wlprs. Rep. vol. i. p. 863.—*Desmanthus polyphyllus*, De Cand. Prodr. vol. ii. p. 444. In swamps near Natá, Province of Panama.

306. Desmanthus *virgatus*, Willd., De Cand. Prodr. vol. ii. p. 445. In shady places; common about Panama.

307. Mimosa *albida*, Kunth, Mim. vol. ii. t. 1. Near Panama.

308. Mimosa *floribunda*, Willd., Spec. vol. iv. p. 1031. Santiago de Veraguas.

309. Mimosa *pudica*, Linn., De Cand. Prodr. vol. ii. p. 426.—Nomina vernacul. "Sensitiva" et "Sierratesierrate." Common on roadsides and in the savanas.

The Panamians believe that a bundle of this plant laid under the pillow will produce a somniferous effect, a belief probably without any foundation whatever.

310. Mimosa *somnians*, H. et B., De Cand. Prodr. vol. ii. p. 427; var. *glanduloso-hispida*, Benth. MSS. Near Panama.

311. Mimosa *asperata*, Linn., Wlprs. Rep. vol. i. p. 878. In swamps and on the banks of rivulets; common throughout the country.

312. Schranckia *brachycarpa*, Benth., Wlprs. Rep. vol. i. p. 884. In savanas, climbing over shrubs, near the city of Panama.

313. Acacia *Farnesiana*, Willd., Wlprs. Rep. vol. i. p. 909.—Seem. Die in Europa eingeführten Acacien, p. 57.—Nomen vernacul. "Flor de Aroma." In sunny places; also cultivated in gardens on account of its fragrant flowers.

This little tree is now cultivated in the tropics of both hemispheres; I collected it besides at Oahu, Sandwich Islands, and on the table-land of the State of Durango, Mexico, where it is commonly called "Visacha." The washerwomen of the Isthmus place the flowers among the linen to perfume it, the flowers never becoming mouldy, a fact deserving consideration.

314. Acacia *spadicigera*, Cham. et Schlecht., Wlprs. Rep. vol. i. p. 912.—Seem. Die in Europ. eingef. Acacien, p. 61.—Nomen vernacul. "Cuernito." Common in savanas from Panama to David.

Forms a pyramidal tree from 20 to 30 feet high, and flowers during the dry season. I have often tried to find a tree without ants, but have never been able; still the hypothesis that the large thorns of this and the allied species are caused by ants is not tenable, because in our European hothouses we grow the plant without any of these insects being attached to it, and nevertheless the thorns are as large as we usually find them in the specimens observed in their native country.

315. Acacia *striata*, H. B. K. in Willd. Spec. vol. iv. p. 1089.—Nomen vernacul. "Aroma de plazetta." Natá, Province of Panama.

In a little work of mine, entitled 'Die in Europa eingeführten Acacien, mit Berücksichtigung der gärtnerischen Namen,' I have made the following observations on the genus *Acacia*:—

"Among those plants which, by their beauty and elegance, attract our attention, the genus *Acacia* occupies a prominent place. Few genera are richer in really beautiful forms, or possess a greater number of truly ornamental species. Their graceful branches, their airy foliage, their numerous, often fragrant flowers, have made them favourites with all those who are sensible to the charms of the Vegetable Kingdom. Especially the Acacias called *Phyllodineæ*, are by their habit, their curiously-shaped leafstalks, and their diversified colour, even if destitute of flowers, objects of particular interest; and although the species with pinnated leaves do not rank so high in this respect, they are nevertheless not destitute of grace or beauty. The Acacias, however, do not deserve attention merely on account of their beauty, but also on account of their useful properties: many of their products are necessaries of life, or serve as articles of luxury. In commerce, in medicine, and in different handicrafts, they play an important part. Some yield a gum used as food by several wild tribes, or employed for technical purposes; others, distinguished by tonic and astringent qualities, are suited for medicine and for tanning; others again, abounding in odorous principles, furnish valuable ingredients for the manufacture of perfume, while again a great number produce fine and durable wood, equally adapted for ornamental furniture and coarse architectural works.

"The genus *Acacia*, although now considerably circumscribed, contains, as far as our present knowledge enables us to state, about 400 species. Their horizontal distribution is limited to the tropical and sub-tropical parts of Asia, Africa, America, and Australia. The most northern species, *A. hirta*, Nutt., is found under the 35th degree of north latitude; the most southern, *A. bossiæoides*, Benth., under the 42nd degree of south latitude. The *Phyllodineæ* are chiefly confined to New Holland and the adjacent islands; only one species, *A. heterophylla*, Willd., is met with to the north of the Equator in the Hawaiian group. The pinnated species are scattered over Asia, Africa, America, and Australia; they are however most numerous in America, and, according to a rough calculation, twenty-nine are found in Australia, thirty in Asia, thirty-five in Africa, and sixty-six in America. The vertical distribution of the genus is, in the equinoctial region, about 7000 feet above the level of the sea; in the temperate zones it is considerably less; those species however which seem to bear the greatest degree of cold are *A. bossiæoides*, Benth., and *A. mollissima*, Willd.; they grow in the southern parts of Van Diemen's Land at an elevation of from 3000 to 4000 feet above the sea.

"Generally speaking, the Acacias are very local; only a few are diffused over a great extent of country, and still fewer enjoy a wide distribution. Perhaps the most common is *Acacia Farnesiana*, which has followed man on his wandering through the tropics, and is now to be met with almost everywhere in the vicinity of human habitations. Several of the Australian species have become perfectly naturalized at the Cape of Good Hope, and impart to some districts of that country a peculiarly foreign air. *Acacia longifolia* covers nearly one-third of St. Helena, where it thrives in such luxuriance that, if its origin was not known from historical sources, one might be inclined to consider it a true native of that island.

"The Acacias are very sociable. Woods are entirely formed of them, an additional reason why those species possessing commercial value are so important. Several of the shadeless forests of New Holland—the bane of travellers—are composed of Acacias, the phyllodia of which, like the leaves of many other Australian plants, being placed horizontally, and thus not presenting any surface, admit the rays of the sun. On the whole the Acacias seem to prefer sunny, exposed situations, and a stony, sterile soil. They are but seldom met with in damp and sheltered positions, and some of the species, which may have been accidentally transported to such places, change their habit to an extraordinary degree, and even in their youth become unhealthy. For instance, *Acacia spadicigera*, Cham. et Schlecht., which, in its natural habitat, is a regular pyramidal tree, producing abundance of blossoms, becomes, on the banks of rivers, whither its seeds are occasionally swept by the heavy tropical rains, an ugly straggling shrub, which seldom bears flowers, and still more seldom fruit."

316. Calliandra *Seemanni*, Benth. MSS. (Tab. XXII.); glabra v. tenuissime canescente-puberula, stipulis parvis lanceolatis, foliis eglandulosis, pinnis unijugis, foliolis sesquijugis oblique oblongis acutis v. obtusiusculis subciliatis, pedunculis petiolo longioribus, floribus sessilibus glabris, calycibus corollæ dimidium æquantibus, legumine plano glabro, valvulis membranaceo-coriaceis marginibus incrassatis.—Affinis *C. tergeminæ* et *C. canescenti;* a priori floribus, ab hoc imprimis glabritie differt; calycis semi-quinquefidi laciniæ ciliolatæ. On banks of several rivers in Veraguas.

A shrub from 8 to 10 feet high. The largest leaflets 1 inch long and about 4 lines broad; pods from 3 to 4 inches long; seeds light-brown, spotted with white dots.

Plate XXII. Fig. 1, a flower; 2, ripe pod; 3, the same cut open; 4 and 5, seeds; 6, 7, 8, and 9, different views of the cotyledons and the embryo:—*all*, with the exception of f. 2 and 3, *magnified*.

317. Calliandra *Surinamensis*, Benth., Wlprs. Rep. vol. v. p. 604; legumine sublignoso crasse marginato glabro. On the banks of rivers in Veraguas.

318. Pithecolobium *oblongum*, Benth., Wlprs. Rep. vol. v. p. 609.—Duchass. et Wlprs. in Flora Ratisb., April 21, 1853, p. 231. Very common on the sea-shore of the Pacific Ocean.

319. Pithecolobium *glomeratum*, Benth.; var. *spicatum*, Seem., floribus spicatis.—Nomen vernacul. "Guavito cansaboca." On the banks of all the rivers of the Isthmus.

The only difference between this variety and the form which served as the type of Bentham's *P. glomeratum*, is that the heads are elongated into spikes; it remains however to be ascertained whether this difference may not be accidental. The specimens figured and distributed by Miquel obviously belong to the variety here described.

320. Pithecolobium *Schomburgkii*, Benth., Wlprs. Rep. vol. v. p. 619. In forests between Cruces and Araijan, Province of Panama.

321. Pithecolobium *fragrans*, Benth., Wlprs. Rep. vol. v. p. 619. Hacienda de San Juan, Veraguas.

322. Pithecolobium *parvifolium*, Benth., Wlprs. Rep. vol. v. p. 621. Very common in the savanas from Panama to Santiago de Veraguas.

323. Enterolobium *Timboïva*, Mart., Wlprs. Rep. vol. v. p. 621.—Nomen vernacul. "Corotu." Common in all the forests of the Isthmus.

This is one of the tallest trees in the country, attaining a height from 80 to 100 feet; the wood is used for building purposes, and for making canoes. The fruit, which ripens in February and March, is a favourite food of the cattle.

324. Inga *tubulifera*, Benth.; var. foliolis sæpe (nec semper) obtusis retusisve, Benth. MSS. Volcano of Chiriqui, Veraguas.

This may perhaps be a distinct species, but as the flowers are too young, it is impossible to determine this point positively. The true *I. tubulifera*, Benth., was collected in Coyba, on the coast of Veraguas, by the expedition of H. M. S. Sulphur.

325. Inga *rufescens*, Benth., Wlprs. Rep. vol. v. 624. Island of Coyba, coast of Veraguas.

326. Inga *globulifera*, Benth., Wlprs. Rep. vol. v. p. 624. Island of Coyba, coast of Veraguas; outskirts of woods near Panama.

327. Inga *Jiniguil,* Schlecht., Wlprs. Rep. vol. v. p. 625. Volcano of Chiriqui, Veraguas.

328. Inga (§ Diadema) *Darienensis,* Seem. (Tab. XXIII.); fruticosa, ramulis petiolis pedunculis costisque foliolorum ferrugineo-pubescentibus, foliolis 2–4-jugis ovali-ellipticis acuminatis basi cuneatis supra nitidulis subtus arcte reticulato-venosis, pedunculis elongatis, corolla calyce puberulo triplo longiore, bracteis spathulato-obovatis, ovario glabro. Dark woods at Cape Corrientes, Darien.

This species is closely allied to *I. Billbergiana.* A shrub about 10 or 12 feet high; the largest leaves 10 inches long; the terminal leaflets 4 inches long and 1 inch broad; flower-heads axillary, solitary; calyx twice as long as the bracts; ovary with five ovules.

Plate XXIII. Fig. 1, an entire flower; 2, calyx; 3, stamens; 4, ovary and style; 5, ovary cut open:—*all magnified.*

329. Inga *laurina,* Willd., Wlprs. Rep. vol. v. p. 626. Near the village of Bocachica, Veraguas.

My plant differs from the usual forms in having paniculated, instead of simple, spikes.

330. Inga *tenuiflora,* Salzm., Wlprs. Rep. vol. v. p. 630. no. 54.—*I. tenuifolia,* Benth. in Hook. Journ. of Bot. vol. iv. p. 595, errore typographico. Cape Corrientes, Darien; also collected by me in the Bay of Choco.

331. Inga *leptoloba,* Schlecht., Wlprs. Rep. vol. v. p. 631. Volcano of Chiriqui, Veraguas.

332. Inga *punctata,* Willd., Wlprs. Rep. vol. v. p. 631. Cruces; Chagres (Fendler, no. 89).

333. Inga (§ Euinga) *Panamensis,* Seem.; arborea, ramulis teretibus, petiolis costisque foliolorum ferrugineo-hirsutis demum glabratis, petiolo sub paribus ultimis auguste alato, glandulis scutellæformibus, foliolis 2–3-jugis obovato-obtusis mucronatis basi obtusis, spicis ovatis simplicibus axillaribus terminalibusve, bracteis linearibus persistentibus calycem paulo superantibus, calyce corollaque hirsutissimis. In woods near the village of Cruces, Province of Panama.

This species comes close *I. Lindeniana,* Benth., but differs from it by its leaflets not being velvety on the under surface, and the bracts being caducous, while in *I. Panamensis* the bracts are persistent, which brings it close to the section "Calocephalæ," to which it would belong if the bracts were larger. *I. Panamensis* is a middle-sized tree; the leaves have two, frequently three pairs of leaflets, the terminal pair is the largest (4 inches long and 2½ inches broad).

334. Inga *spectabilis,* Willd., Wlprs. Rep. vol. v. p. 637.—Nomen vernacul. "Guavo real." On account of its edible fruit, cultivated all over the country; Chagres (Fendler, no. 67).

There is a slight discrepancy between the diagnosis of *I. spectabilis,* as given by Bentham, and my plant: the branches and leaflets are said to be glabrous, while in my specimens the branches, petioles, and ribs of the leaflets are pubescent; the latter are besides very often ten inches long. The pods are very large, occasionally two feet and more long, and the white pulp surrounding the seeds has a pleasant flavour, and is much eaten by the inhabitants; it is exactly like that of *Inga! Feuillei,* De Cand., the Pacay of the Peruvians.

335. Inga *Berteriana,* De Cand., Wlprs. Rep. vol. v. p. 640. Woods about Cruces.

336. Inga (§ Euingæ veræ) *Oerstediana,* Benth. MSS. in Leg. Oerst. ined.; pube rubiginosa densa, foliolis 4-jugis oblongo- v. ovali-ellipticis obtusiusculis supra vix demum nitidulis, spicis oblongis breviter pedunculatis, bracteis parvis orbiculatis caducis, calyce parvo sessili rubiginoso-

velutino, corolla tenui rufo-villosissima calyce subtriplo longiore.—Ab omnibus Euingis differt calyce raro 2 lineas excedente tubuloso v. subcampanulato, corolla 5–6 v. rarius 6½ lin. longo, tenuiore quam in cæteris; legumen ignotum, sed folia et pubes Euingarum. Volcano of Chiriqui, Veraguas.

This appears to me to be identical with *I. clavigera*, Moritz, judging from Moritz's specimens in Herb. Hook.; I do not know whether that name has been published.

Walpers and Duchassaing have described (Wlprs. Ann. vol. ii. p. 459 et 460) two species of *Inga*, *I.* (§ Pseudinga) *Mucuna*, and *I.* (§ Euinga) *galibica*, which I did not meet with in the Isthmus; Fendler has also collected two or three species, besides those here enumerated.

BURSERACEÆ.

337. Bursera *gummifera*, Linn., De Cand. Prodr. vol. ii. p. 78.—Nomen vernacul. "Amasigo." In sunny, exposed situations; common throughout the southern parts of Panama and Veraguas.

This tree is of middle size; it is used for making fences; the wood is easy to cut, and the sticks, when put into the ground, soon produce young shoots. The gum that exudes from the stem is applied to wounds, and considered to have very beneficial effects.

CHRYSOBALANEÆ.

338. Chrysobalanus *Icaco*, Linn., De Cand. Prodr. vol. ii. p. 525.—Nomen vernacul. "Icaco." Common on the seaside of both coasts of the Isthmus; Chagres (Fendler, no. 107).

339. Licania (§ Eulicania) *hypoleuca*, Benth. in Bot. Sulph. p. 91. t. 32. In the Province of Veraguas.

340. Licania (§ Hymenopus) *arborea*, Seem. (Tab. XXV.); ramulis, petiolis, costis foliorum, stipulis, rachidibus calycibusque dense rufo-tomentosis, foliis ovato-oblongis basi cordatis apice acutis vel sæpe obtusissimis margine integerrimis supra glabris nitidis subtus incano-villosis, stipulis caducis, paniculis terminalibus, florum glomerulis sessilibus, calyce subgloboso 5-dentato, petalis obovato-oblongis hirsutis, staminibus fertilibus 8–9, drupa olivæformi glabra.—Nomen vernacul. "Rasca." In savanas and on the outskirts of forests between Tole and David, Province of Veraguas; David (Cuming, no. 1109).

A tree about 60 feet high; wood durable, used for building purposes. Leaves coriaceous, from 5 to 6 inches long and from 2 to 3 inches broad; calyx persistent; stamens, ovary, and style villous; fruit black.

Plate XXV. Fig. 1, an entire flower; 2, a portion of the same cut open; 3, petal; 4, stamens; 5, ovary and style; 6, drupes not quite ripe; 7, a drupe; 8, the same cut open:—*all*, with the exception of f. 6, *magnified*.

341. Hirtella *triandra*, Swartz, De Cand. Prodr. vol. ii. p. 528. Bay of Solano.

342. Hirtella *glandulosa*, Sprengl., De Cand. Prodr. vol. ii. p. 528. On the outskirts of woods near Cruces, Province of Panama.

Hooker's Herbarium contains specimens of this plant from Pernambuco (Gardner), Minas Geraes (Claussen), and other, not specified, parts of Brazil (Chamisso, Sellow).

343. Hirtella *racemosa*, Lam., De Cand. Prodr. vol. ii. p. 529.—Nomen vernacul. "Camaron." In dark woods; very common between Panama and Chagres.

ROSACEÆ.

344. Prunus (Cerasus) *occidentalis*, Swartz, De Cand. Prodr. vol. ii. p. 540. Volcano of Chiriqui, Veraguas.

345. Rubus *occidentalis*, Linn., De Cand. Prodr. vol. ii. p. 558.—Nomen vernacul. "Zarzamora." Volcano of Chiriqui, Veraguas.

The fruit of this and the following species is eaten.

346. Rubus *urticæfolius*, Poir., De Cand. Prodr. vol. ii. p. 563.—*R. trichomallus*, Schlecht. Linnæa, vol. xiii. p. 268!—Nomen vernacul. "Zarzamora." Volcano of Chiriqui, Veraguas.

This species is diffused over Mexico (Schlechtendal), Ecuador (Jameson), and Peru (Mathews). The leaflets are very often five in number.

COMBRETACEÆ.

347. Chuncoa *obovata*, Poir.? De Cand. Prodr. vol. iii. p. 15. Forests near the village of Cruces, Province of Panama.

My specimens being only in fruit, and their leaves not quite developed, I am not quite certain whether they are identical with *C. obovata*, Poir.

348. Conocarpus *erecta*, H. B. K., De Cand. Prodr. vol. iii. p. 16.—Nomen vernacul. "Mangle piñuelo." Common on the sea-shores, growing with *Paritium tiliaceum*, *Hippomane Mancinella*, and *Ximenia Americana*.

Hooker's Herbarium contains specimens of this plant, from Jamaica (Wilson, Distan), St. Vincent (Guilding), Maranham (Gardner), Bahia (Salzmann), Pernambuco (Gardner), some other part of Brazil not specified (Sellow), Demerara (Parker), Veracruz (Linden), some other part of Mexico not specified (Jurgensen), Panama (Cuming, no. 1111), Galapagos Islands (Scouler), and Sierra Leone (Th. Vogel). It was also found at Puna near Guayaquil (Benth. in Bot. Sulph.) and on the Gambia (Don).

349. Lacunclaria *racemosa*, Gærtn., De Cand. Prodr. vol. iii. p. 17. Common on both coasts, growing among Mangrove-trees.

I quote from Herb. Hook. the following stations of this plant:—Jamaica (Wilson, Purdie), Pernambuco (Gardner), Bahia (Salzmann), Demerara (Parker), Surinam (Hostmann), and Honduras (Armstrong). It was found by Th. Vogel at Fernando Po and Grand Bassa, according to Hooker's 'Niger Flora,' p. 337.

350. Poivrea *alternifolia*, De Cand. Prodr. vol. iii. p. 17.—Wlprs. Rep. vol. ii. p. 64. Island of Iguana, Bay of Panama.

351. Combretum *laxum*, Jacq., De Cand. Prodr. vol. iii. p. 18. Southern parts of Veraguas.

352. Combretum *farinosum*, H. B. K., De Cand. Prodr. vol. iii. p. 19. Common on the seashore of the Pacific Ocean.

353. Combretum *adenophyllum*, Mart., Wlprs. Rep. vol. ii. p. 65. Paredez Islands, on the coast of Veraguas.

VOCHYSIEÆ.

354. Vochysia *tomentosa,* De Cand. Prodr. vol. iii. p. 26. In forests between Panama and Cruces, and in the Island of Coyba.

This tree attains a height of about 60 feet, and during the dry season is covered with dark yellow blossoms, of a most penetrating, violet-like odour. If I remember right, it is vernacularly termed "Tecla."

RHIZOPHOREÆ.

355. Rhizophora *Mangle,* Linn., De Cand. Prodr. vol. iii. p. 32.—Nomen vernacul. "Mangle salado." Very common on the sea-shores, growing in company with Avicennias and Lacunculariæ.

ONAGRARIEÆ.

356. Fuchsia *microphylla,* H. B. K., De Cand. Prodr. vol. iii. p. 36. Volcano of Chiriqui, Veraguas.

This species was collected in Mexico by Schiede, Parkinson, Hartweg, Galeotti, and Linden; their specimens are preserved in Herb. Hook.

357. Jussiæa *affinis,* De Cand. Prodr. vol. iii. p. 53. Hacienda de Cocoli, Province of Panama; Chagres (Fendler, no. 115).

358. Jussiæa *sedoides,* H. et Bonpl., De Cand. Prodr. vol. iii. p. 54. Near the village of Anton, Province of Panama.

This plant was collected in Jamaica (Purdie), at Santarem (Spruce), and in other parts, not specified, of Brazil (W. Lobb, Blanchet).

359. Jussiæa *angustifolia,* Lam., De Cand. Prodr. vol. iii. p. 55. Near Panama; Chagres (Fendler, no. 116).

360. Jussiæa *nervosa,* Poir., De Cand. Prodr. vol. iii. p. 56. On the banks of rivulets, near the village of Tole, Veraguas.

This plant is shrubby, and often attains a height of 6 to 7 feet. When old, its leaves are very narrow, often quite linear; when young they are much broader; hence the aspect of the specimens in the Herbaria is very diversified, and at first sight leads one to think that they must belong to several distinct varieties, if not species. *J. nervosa* seems to be confined to the continent of South America, where it is widely distributed. I have seen specimens from Peru (Mathews), Berbice (Schomburgk), Essequibo (Schomburgk), Demerara (Parker), Surinam (Hostmann), and Brazil (Gardner, nos. 2573, 2574, and 2842).

361. Jussiæa *octofila,* De Cand. Prodr. vol. iii. p. 57. Common all over the country.

362. Lopezia *paniculata,* Seem.; fruticosa, ramis albido-hirsutis, foliis ovato-lanceolatis acuminatis acutis minute pellucido-punctatis remote denticulatis supra pubescente-hirtellis subtus hirsutis, racemis paniculatis axillaribus terminalibusque, pedicellis elongatis, calycibus petalis staminibus capsulisque glabris. Volcano of Chiriqui, Veraguas.

A shrub about 6 feet high. Branches erect; leaves alternate, 1½ inch long and 3 lines broad; pedicels glabrous, three-quarters of an inch long; petals white; sterile stamen purplish.

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LYTHRARIEÆ.

363. Cuphea *appendiculata*, Benth., Wlprs. Rep. vol. ii. p. 105.—*C. elegans*, Klotzsch, ubi? Volcano of Chiriqui, Veraguas; Mexico (Hartweg, no. 462).

364. Cuphea *Balsamona*, Cham. et Schlecht., Wlprs. Rep. vol. ii. p. 107. Common in the savanas all over the country.

365. Cuphea *rivularis*, Seem.; suffruticosa, ramulis hirsutis demum glabris, foliis oppositis lanceolatis basi rotundatis margine ciliato-denticulatis apice acutis supra glabris subtus pubescenti-hirsutis, pedicellis alaribus 1-floris, calyce brevissime calcarato subhirsuto, petalis 5 inæquilongis (violaceis), staminibus 11, filamentis villosis, ovario 10-ovulato, capsula . . . . On the banks of rivers near Tole, Province of Veraguas.

A shrub a foot high, often decumbent. Leaves about 1 inch long and 1 line broad; flowers small, like those of its allies *C. Balsamona*, *C. gracilis*, and *C. denticulata*.

366. Cuphea *antisyphilitica*, H. B. K., De Cand. Prodr. vol. iii. p. 87. Common on the outskirts of woods all over the country.

It is very likely that this so-called species is a mere variety or even form of *C. Balsamona*, but until the whole genus *Cuphea* has been revised, it is better to consider it as a separate species.

367. Cuphea *gracilis*, H. B. K., De Cand. Prodr. vol. iii. p. 87. On rocks in rivers near Panama.

This species, which has quite the habit of *C. hyssopifolia*, H. B. K., was found by Skinner in Guatemala, and by Linden in Mexico.

368. Cuphea *rigidula*, Benth., Wlprs. Rep. vol. ii. p. 108. In the woods of Southern Darien.

369. Dodecas *Surinamensis*, Linn. fil., De Cand. Prodr. vol. iii. p. 91. Southern Darien, common on the sea-side.

MELASTOMACEÆ.

The Natural Order *Melastomaceæ*, of which at present 40 species are known to exist in the Isthmus, exercises a marked influence upon the aspect of its Flora. *Melastomaceæ* are found in almost every locality, in dry and wet places, in sunny savanas and in shady forests, in the lower coast region, and on the mountains several thousand feet above the sea-level. Most of them are shrubby, only a few (6) are herbaceous, and but three (*Bellucia Aubletii*, Naud., *Miconia longistyla*, Stendl., and *M. prasina*, De Cand.) arboreous; their leaves are, with a few exceptions, covered more or less with hair; their flowers are generally small,—only three species (*Rhynchanthera insignis*, Naud., *Lasiandra bipenicillata*, Naud., and *Bellucia Aubletii*, Naud.) produce blossoms which may be termed large, and would on that account obtain for them a place in a garden; and they are moreover in most cases white. Their fruit is mostly a berry, only in a few instances (11) a capsule, and if we except *Centradenia rosea*, Don, *Oreocosmus ferrugineus*, Seem., *Lasiandra bipenicillata*, Naud., and *Monochætum Humboldtianum*, Kth., it may be said that the capsular *Melastomaceæ* are found in wet places, and the berry-bearing ones in dry.

In an economical point of view these *Melastomaceæ* are of little value. The wood of several species (*Bellucia Aubletii*, Naud., *Miconia longistyla*, Steudl., and *M. prasina*, De Cand.) is sometimes used for building purposes; the leaves of *Conostegia speciosa*, Naud., are employed in washing plates and other vessels, on account of which the plant is sometimes called *Friego-plato;* and the insipid berries of *Bellucia Aubletii*, Naud., as well as those of several species of *Staphidium*, *Miconia*, and *Clidemia*, are eaten.

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It may therefore be said that on the whole the Isthmus derives little advantage from the numerous *Melastomaceæ* which have taken up their abode in it; they neither contribute much towards enlivening its scenery, nor are they of much use to the inhabitants; and as all the members of this family are also found in countries north, south, west, or east of the Isthmus, even the distinction of possessing some endemic species is denied to the Flora.

370. Rhynchanthera *insignis*, Naud. Melast. p. 15. In swampy savanas about Aguadulce, Natá, and San Juan, Province of Panama.

A shrub from 4 to 5 feet high. Flowers large, purple.

371. Centradenia *rosea*, Don, Naud. Melast. p. 76. In half-shady places on the sides of rocks; Volcano of Chiriqui, Province of Veraguas.

372. Noterophila *inudata*, Mart., Naud. Melast. p. 84.—*Microlicia inudata* et *M. limnobios*, De Cand. Prodr. vol. iii. p. 117. In swamps near Panama.

373. Uranthera *recurva*, Naud. Melast. p. 88.—*Micolicia recurva*, De Cand. Prodr. vol. iii. p. 118. In swamps near Panama.

374. Nespera *aquatica*, Naud. Melast. p. 93.—*Spennera aquatica*, De Cand. Prodr. vol. iii. p. 116. In moist places, Island of Chirambira, Darien.

375. Pterogastra *cupheoides*, Seem.—*Heeria cupheoides*, Benth. in Bot. Sulph. p. 93. t. 33. Near springs; found both in Panama and Darien.

376. Oreocosmus *ferrugineus*, Seem.—*Chætogastra? ferruginea*, Hook. et Arn., Bot. Beech. p. 423. Volcano of Chiriqui, Veraguas.

A shrub about 3 feet high. Segments of the calyx and the petals purple.—Closely allied to *O. monticola*, Naud., if not identical with that species.

377. Lasiandra *bipenicillata*, Naud. Melastom. p. 135. In sunny places, Santiago de Veraguas.

378. Micranthella *lanceolata*, Naud. Melast. p. 171.—*Chætogastra lanceolata*, De Cand. Prodr. vol. iii. p. 131. Common in plantations and on the banks of rivulets, often in company with *Desmodium cajanifolium*; it was also found by me in Sassaranga, Ecuador.

379. Spennera *circæoides*, De Cand. Prodr. vol. iii. p. 116.—Naud. Melast. p. 236. Island of Chirambira, Darien.

380. Monochætum *Humboldtianum*, Kunth, Delect. Sem. pl. hort. Berol., 1844.—Naud. l. c. p. 248. Volcano of Chiriqui, Veraguas.

381. Bellucia *Aubletii*, Naud. Melast. p. 348 (Tab. XXVI.); arborea, glaberrima, foliis elliptico-ovatis apiculatis basi nonnunquam acutiusculis triplo-quintuplinerviis pagina superiore nitentibus, floribus 7–8-meris, calycis limbo membranaceo in lobos irregulares lacero, stigmate capitato 14–15-costato, fructibus edulibus.—*Blakea quinquenervia*, Aubl. Guy. vol. i. p. 525. t. 214.—De Cand. Prodr. vol. iii. p. 195.—Nomen vernacul. "Coronillo." On the outskirts of forests; common in Western Veraguas.

A tree about 30 feet high. Fruit edible.—I do not think that the five species of *Bellucia* proposed by Naudin will be found to be good species; to me they appear mere varieties of *B. Aubletii*, which, in the

form and size of the leaves, the more or less regular splitting of the calyx, and the colour of the petals, is very variable.

PLATE XXVI. Fig. 1, calyx, ovary, and style; 2, anther; 3, ovary cut open:—*all magnified.*

382. CONOSTEGIA *Xalapensis,* Don, Naud. Melast. p. 393.—De Cand. Prodr. vol. iii. p. 175. Volcano of Chiriqui and Montaña de Chorcha, Veraguas; Chagres, Province of Panama (Fendler).

383. CONOSTEGIA *polyandra,* Benth. in Bot. Sulph. p. 96. t. 35. Island of Chirambira, Darien.

A shrub 6 to 8 feet high. Flowers white; berry black.

384. CONOSTEGIA sp. In dark forests at Cape Corrientes, Darien.

Appear to be new, but the flowers are not developed enough to allow the specimens being determined.

385. CONOSTEGIA *speciosa,* Naud. Melast. p. 391.—Nomen vernacul. "Hojo oscuro." Common in the savanas about Panama.

A shrub from 6 to 10 feet high; easily distinguished from its allies by its blue alabastra and rose-coloured petals. It was also collected on the western side of New Granada by Cuming (no. 1258), and on the eastern by Linden and Purdie; the latter obtained it at Santamarta.

386. MICONIA *impetiolaris,* De Cand. Prodr. vol. iii. p. 183.—Naud. Melast. p. 419.—Nomen vernacul. "Dos caras." On the outskirts of woods and in savanas; common all over the country.

A shrub about 10 feet high. The variety *M. impetiolaris,* DC., var. *pandurifolia,* Naud., was collected at Panama by Duchassaing.

387. MICONIA *holosericea,* De Cand. Prodr. vol. iii. p. 181.—Naud. Melast. p. 428. Common in sunny places all over the country.

388. MICONIA *argyrophylla,* De Cand. Prodr. vol. iii. p. 181.—Naud. Melast. p. 429. Tole, Province of Veraguas.

389. MICONIA *longistyla,* Steudl., Naud. Melast. p. 430.—*M. Schomburgkii,* Benth. in Hook. Journ. Bot. vol. ii. p. 312.—Nomen vernacul. "Cainillo." Outskirts of woods, from Panama to Tole.

A tree from 30 to 35 feet high; its wood is used for building purposes.

390. MICONIA *lacera,* Naud. Melast. p. 434.—*Clidemia lacera,* De Cand. Prodr. vol. iii. p. 164. Chagres (Fendler).

391. MICONIA *racemosa,* De Cand. Prodr. vol. iii. p. 179.—Naud. Melast. p. 435. In forests near Cruces, Province of Panama.

392. MICONIA *Melanodendron,* Naud. Melast. p. 444.—*M. myriantha,* Benth. in Hook. Journ. of Bot. vol. ii. p. 314!—*M. tristis,* Spring. Flora, vol. xx. p. 76!—*M. depauperata,* Gardn. in Hook. Journ. of Bot. vol. ii. p. 346!—Nomen vernacul. "Caimitillo." Common in exposed positions all over the country.

393. MICONIA *rubiginosa,* De Cand. Prodr. vol. iii. p. 183.—Naud. Melast. p. 447.—*M. astrolaria,* De Cand. l. c.?—*Cremanium Caracasanum,* Willd. Herb., fide Cl. Klotzsch in Herb. Hook.! In savanas about Panama, but comparatively rare.

In Hooker's Herbarium there are specimens of this plant from Brazil (Sellow), Venezuela (Funke), and Peru (Mathews).

394. Miconia *prasina*, De Cand. Prodr. vol. iii. p. 188.—Naud. Melast. p. 454. Common all over the country.

To the great number of synonyms which Naudin considers as belonging to this variable and widely diffused species, I think the *M. ambigua*, De Cand. (Prodr. vol. iii. p. 189), might be added without hesitation.

395. Miconia *auriculata*, De Cand. Prodr. vol. iii. p. 185.—Naud. Melast. p. 457. Woods near Cruces.

396. Miconia *caudata*, De Cand. Prodr. vol. iii. p. 187.—Naud. Melast. p. 466. Volcano of Chiriqui, Veraguas.

Miconia pendulifolia, De Cand. (Prodr. vol. iii. p. 187) was collected at Chagres (Fendler, no. 39).

397. Staphidium *octonum*, Naud. Melast. p. 530.—*Heterotrichum octonum*, De Cand. Prodr. vol. iii. p. 173. Near Panama (Duchassaing).

398. Staphidium *pauciflorum*, Naud. Melast. p. 532.—*Clidemia crenata*, De Cand. Prodr. vol. iii. p. 157. In woods; common all over the country.

399. Staphidium *fenestratum*, Seem.—*Clidemia fenestrata*, Benth., Bot. Sulph. p. 94. Island of Taboga; Chagres (Fendler).

400. Staphidium *spicatum*, Naud. Melast. p. 540.—*Clidemia pustulata* et *C. spicata*, De Cand. Prodr. vol. iii. p. 158 et seq. In woods; common throughout the Isthmus.

401. Staphidiastrum *rubrum*, Naud. Melast. p. 555.—*Sagræa sessiliflora* et *S. columneæfolia*, De Cand. Prodr. vol. iii. p. 170. In savanas; common all over the country.

402. Clidemia *pilosa*, Don? De Cand. Prodr. vol. iii. p. 160. Island of Cacagual, Darien.

403. Clidemia *cyanocarpa*, Benth. in Bot. Sulph. p. 94. Woods about Cruces, Province of Panama.

404. Clidemia *macrophylla*, Naud. Melast. p. 599.—*Oxymeris macrophylla*, Benth. in Bot. Sulph. p. 95. Forests of Darien.

405. Sagræa *scabrosa*, Naud. Melast. p. 619.—*Ossæa scabrosa*, De Cand. Prodr. vol. iii. p. 169. Woods near Cruces, Province of Panama.

A small tree, about 15 feet high.

406. Topobea *superba*, Naud. Melast. p. 669. In dark woods near the village of Remedios, Province of Veraguas, growing epiphytically.

The leaves of my specimens are not so large as those described by Naudin; the petals are purple.

407. Mouriria *parvifolia*, Benth. in Bot. Sulph. p. 97. t. 36. Outskirts of woods near Panama; Bahia Honda (Hinds).

A shrub about 12 feet high. Flowers purplish.

Besides the *Melastomaceæ* here enumerated, I noticed a species of *Tococa*, growing on the outskirts of woods in the neighbourhood of the village of San Juan, Province of Panama.

MYRTACEÆ.

408. Campomanesia *glabra,* Benth. in Hook. Journ. of Bot. vol. ii. p. 319.—Wlprs. Rep. vol. ii. p. 170.—*Myrtus chlorocarpa,* Benth. MS. in Herb. Hook.!—*Myrtus? Gœtheana,* Mart., De Cand. Prodr. vol. iii. p. 240. Common all over the Isthmus; Chagres (Fendler, no. 105).

A shrub or small tree, closely allied to *Myrtus ambrosina,* Moritz. Leaves varying in size, and either acute or long acuminate at the apex. It is apparently widely distributed over the South American continent, having been collected in Demerara (Parker) and in Essequibo (Schomburgk); as well as at Pará (Spruce), Barra (Spruce), and some other not specified place in Brazil (Sellow).

409. Psidium *Guaiava,* Raddi, Mem. 1822, p. 2.—*P. pyriferum,* Linn., De Cand. Prodr. vol. iii. p. 233.—*P. pomiferum,* Linn., De Cand. l. c. p. 234!—Nomen vernacul. "Guayavo." Common all over the country, and also cultivated in gardens on account of its edible fruit.

I confess myself, like Raddi, unable to distinguish *P. pyriferum,* Linn., from *P. pomiferum,* Linn. In the former the fruit is stated to be more stretched and narrowed at the base, in the latter it is more or less globose, but the transition from the one form to the other is so clearly observable, if any number of fruits are examined, that no importance can possibly be attached to the form; and, as also the form of the leaves, the hairy covering of the foliage, and the number and division of the peduncles, the taste of the pulp, are subject to great variation, it would probably be wise if Botanists were to follow Raddi and myself in uniting *P. pyriferum* and *pomiferum,* adopting either the name which Raddi has proposed, *P. Guaiava,* Raddi, or one of those given by Linnæus to the plant.—In the Isthmus this tree is termed Guayavo, whence the English colonial name Guava; its fruit is eaten either raw or boiled as sweetmeat.

410. Psidium *polycarpon,* Lamb., De Cand. Prodr. vol. iii. p. 235.—Nomina vernacul. "Guayavo de savana" et "Guayavo peludo." Common in savanas, all over the Isthmus.

A shrub 3–8 feet high,—widely distributed in tropical America (Cuming, no. 1273).

411. Calyptrantes *Schlechtendaliana,* Seem.—*Myrcia aromatica,* Schlecht., Linnæa, vol. xiii. p. 415! In dark forests of the Island of Coyba, coast of Veraguas; Island of Taboga (Hinds).

Schlechtendal, not seeing the lateral operculum of the calyx, referred this species to *Myrcia;* fortunately he described it so well in other respects, as far as his imperfect materials would permit, that better specimens at once enabled me to identify and refer the plant to its proper genus.

412. Eugenia *Arayqn,* Seem.—*Myrtus? Arayan,* H. B. K., Nov. Gen. Am. vol. vi. p. 133; fruticosa, ramulis hirtellis, foliis ovato-oblongis basi cuneatis apice acutis reticulatis glabris nitidis, pedunculis axillaribus folio æquantibus apice dichotome cymosis 7-floris vel abortu 1- vel 2-floris, floribus in dichotomia sessilibus cæteris pedicellatis, calycibus 4-fidis, lobis obtusis. Outskirts of woods, Volcano of Chiriqui, Veraguas.

This species is allied to *E. alaternifolia,* Benth., and *E. pycnantha,* Benth. It was found by Jameson on the Andes of Ecuador, where it had previously been collected by Humboldt and Bonpland, and is called Arayan.

413. Eugenia *Guayaquilensis,* De Cand. Prodr. vol. iii. p. 275. Island of Coyba, coast of Veraguas.

414. Eugenia *sericiflora,* Benth. in Bot. Sulph. p. 98.—Wlprs. Rep. vol. v. p. 753. Common all over the country.

415. Eugenia sp., Herb. Nostr. no. 476. Woods near the Hacienda de Juan Lanas.

The specimens are in too imperfect a state to allow of description.

416. Myrcia *acuminata*, De Cand. Prodr. vol. iii. p. 256. In the savanas of Panama and Veraguas.

417. Jambosa *vulgaris*, De Cand. Prodr. vol. iii. p. 286.—Nomen vernacul. "Pomaroso." Cultivated on account of its edible fruit.

418. Punica *Granatum*, Linn., De Cand. Prodr. vol. iii. p. 3.—Nomen vernacul. "Granado." Cultivated for ornamental purposes.

BARINGTONIEÆ.

419. Gustavia *angustifolia*, Benth., Bot. Sulph. p. 99.—Wlprs. Rep. vol. v. p. 756.—Nomen vernacul. "Membrillo." In the central districts of the Province of Panama, forming entire woods by itself.

A tree about 50 feet high; wood durable,—used for building purposes; branches erect, and mostly simple; leaves more generally petiolated than sessile, and more or less serrulated; racemes terminal, or growing from the old wood, in the latter case the flowers, which are purplish, are the largest; fruit ripens in June and is edible.

420. Grias *Fendleri*, Seem.; glabra, foliis sessilibus obovato-spathulatis acuminatis in petiolum angustatis integerrimis, costa nervisque secundariis utrinque prominulis, racemis trunco ramisque innascentibus abbreviatis, floribus pedicellatis vel subsessilibus, calyce integerrimo vel demum irregulariter fisso, petalis 4 obovato-oblongis obtusis (flavis), staminibus numerosis, filamentis basi in annulum connatis, antheris bilocularibus dorso insertis longitudinaliter dehiscentibus, ovario 4- vel abortu 3-loculari, ovulis paucis, stigmate sessili cruciatim quadrilobo, bacca . . . In forests near Chagres (Fendler, no. 185).

A tree; leaves 1½–2 feet long, and from 6 to 8 inches broad, very much resembling those of *Cespedesia macrophylla*, Seem.; flowers about 1 to 1½ inch across; petals coriaceous, imbricate in æstivation; stamens about 100, the inner ones the shortest; placentæ axile, ovules numerous.

Grias appears to stand between the Asiatic genus *Careya* and the American one *Gustavia*: with the former it agrees in the number of the petals and the 4-lobed stigma, with the latter in the entire calyx.

LECYTHIDEÆ.

421. Lecythis *coriacea?* De Cand. Prodr. vol. iii. p. 291.—Nomen vernacul. "Ollito." Dark forests near Remedios, Veraguas.

In leaf my specimens agree well with those of *L. coriacea*, in Hooker's Herbarium, distributed by Martius; but as the former have no flowers, and as I have only seen an imperfect fruit of the tree, I am not sure whether I am correct in referring the *Ollito* of the Panamians to *L. coriacea*. De Candolle does not describe the fruit of *L. coriacea*; that of my plant is about an inch across.

422. Couroupita *odoratissima*, Seem. in Hook. Journ. of Bot. and Kew Gard. Misc. vol. iii. p. 301; foliis obovatis apice acutis basi cuneatis margine integerrimis breviter petiolatis, costa, nervis secundariis petiolisque hirsuto-pubescentibus, stipulis subcordatis tomentosis caducis, racemis

trunco ramisque innascentibus simplicibus vel paniculatis, rachidibus pedicellis calyceque rufo-tomentellis demum glabratis, calyce 6-lobo, lobis petalisque oblongis obtusis margine fimbriatis.—Nomina vernacul. "Granadillo" et "Palo de paraiso." Wood near the village of Rio Jesus, Province of Veraguas; also found in the plains of Molina by Purdie.

A tree from 60 to 80 feet high; the stem and the lower branches covered with racemes of flowers, which in some instances become branches. Leaves alternate, 6–9 inches long and 3–4 inches broad; pedicels 1 inch long; flowers, appearing from February until May, 1½ to 2 inches across, emitting, like those of *C. Guianensis*, Aubl., a most penetrating odour; petals of a pink colour, with yellow stripes, yielding when bruised, according to Purdie, a blue dye; stamens very numerous, anthers of a bright yellow; stigma on a very short style or almost sessile, diverging in six fimbriated rays; fruit unknown.—The people in Veraguas believe that this plant is confined to only one wood near Rio Jesus, and I did not observe it in any other locality of the Isthmus; but the fact that Purdie found it near Santamarta, shows that it has a considerable geographical range.

CUCURBITACEÆ.

423. Fevillea *tamnifolia*, Humb. et Bonpl., Nov. Gen. et Sp. vol. vii. t. 648. Woods near Panama.

424. Anguria *eriantha*, Pœpp. et Endl., Wlprs. Rep. vol. ii. p. 197. In woods between Chagres and Panama.

Leaves very variable, according to the age and station of the plant, sometimes entire and sometimes from five- to seven-lobed.

425. Anguria *trifoliolata*, Linn., De Cand. Prodr. vol. iii. p. 319. On the outskirts of woods near Panama.

426. Citrullus *vulgaris*, Schrad., Wlprs. Rep. vol. ii. p. 199.—*Cucumis Citrullus*, Ser., De Cand. Prodr. vol. iii. p. 301.—Nomen vernacul. "Sandilla." Cultivated all over the country on account of its edible fruit.

427. Momordica *Charantia*, Linn., De Cand. Prodr. vol. iii. p. 311. Common in hedges about Panama.

428. Luffa *acutangula*, Ser., De Cand. Prodr. vol. iii. p. 302.—Nomen vernacul. "Calabaza de China." Naturalized in the neighbourhood of the city of Panama.

429. Lagenaria *vulgaris*, Ser., De Cand. Prodr. vol. iii. p. 299. Extensively cultivated on account of the woody shells of its fruit, which are used for making bottles and other household vessels.

430. Cucumis *Melo*, Linn., De Cand. Prodr. vol. iii. p. 300.—Nomen vernacul. "Melon." Cultivated extensively on account of its edible fruit.

431. Cucumis *sativus*, Linn., De Cand. Prodr. vol. iii. p. 300.—Nomen vernacul. "Pepino." Cultivated on account of its edible fruit.

432. Cucurbita *maxima*, Duch., De Cand. Prodr. vol. iii. p. 316. Cultivated.

433. Apodanthera *gracilis*, Benth. in Bot. Sulph. p. 99.—Wlprs. Rep. vol. v. p. 761. In hedges and among brushwood, Island of Taboga, and about the city of Panama.

Flowers pale yellow; fruit black.

434. Rytidostylis *gracilis*, Hook. et Arn., Wlprs. Rep. vol. v. p. 762. Found all over the Isthmus, and gathered by different collectors in Central America and the Southern States of Mexico.

A genus allied to *Elaterium*.—Flowers of this species dark orange.

435. Cyclanthera *dissecta*, Arn., Wlprs. Rep. vol. v. p. 762. Creeping between low shrubs in the vicinity of Panama.

436. Sicyos *angulatus*, Linn., De Cand. Prodr. vol. iii. p. 309. Common about Panama.

437. Sechium *edule*, Swartz, De Cand. Prodr. vol. iii. p. 313.—Nomen vernacul. "Chayote." Cultivated on account of its edible fruit, which is used as a culinary vegetable.

The Panamian name "Chayote" is a corruption of the Aztec one, *Chayotl*.

BEGONIACEÆ.

438. Begonia *squarrosa*, Lieb. Mexicos og Central Americas Begonier, p. 7. Western Veraguas.

439. Begonia *nelumbiifolia*, Schlecht. et Cham., Wlprs. Rep. vol. ii. p. 209. Cape Corrientes, Darien.

440. Begonia *hernandiæfolia*, Hook. Bot. Mag. t. 4676. Western Veraguas.

441. Begonia *sericoneura*, Lieb. Mex. og C. Am. Beg. p. 13; capsula glabra, alis triangularibus acutis. Volcano of Chiriqui, Veraguas.

The species is now cultivated in the Royal Botanic Garden at Kew, having been introduced by me. When cultivated the whole plant is much less woolly than in a wild state, and occasionally almost glabrous.

442. Begonia *incarnata*, Lk. et Otto, Wlprs. Rep. vol. ii. p. 213. Volcano of Chiriqui, Veraguas.

443. Begonia *multinervia*, Lieb. l. c. p. 18. Woods about San Lorenzo, Veraguas.

444. Begonia *filipes*, Benth., Bot. Sulph. p. 101. Common all over the Isthmus, and extending thence to Central America, where Öersted found it on the Mombacho.

445. Begonia *humilis*, Dryand., var. *glabrata*, Seem.; caule foliisque glabratis. Chagres (Fendler, no. 297).

PAPAYACEÆ.

446. Carica *Papaya*, Linn., Wlprs. Rep. vol. ii. p. 205.—Nomen vernacul. "Papayo." Cultivated.

The leaves of this tree are used instead of soap; the fruit is eaten either raw or boiled, and has, as is well known, the effect of rendering the toughest meat tender.

447. Carica sp.—Nomen vernacul. "Papayo cimaron," *i. e.* Wild Papayo. In dark woods, between Panama and Portobelo.

The fruit of this species is as large as a swan's egg; my species of the leaves and flowers have unfortunately been lost.

PASSIFLORACEÆ.

All botanists consider *Turneraceæ* and *Passifloraceæ* as allied to each other, but few seem to be aware that these Orders are so closely related as they really are, that the differences between them are merely imaginary, that in fact they constitute one and the same natural family of plants. I was led to this conclusion by the discovery of the American genus *Erblichia*, Seem.,—figured in Plate XXVII. of this work,—and by subsequent examination of several *Turneraceæ*.

All *Turneraceæ* are described in systematic works as "Herbaceous plants, having sometimes a tendency to become shrubby." This description however applies to only a few Turneras; *T. salicifolia*, St. Hil. (*T. Hindsiana*, Benth.! *Corchorus grandiflorus*, Spring!) is a real shrub from 6 to 8 feet high, and *Erblichia odorata*, Seem., is a good-sized tree, often attaining a height of 30 feet and more. The leaves are said to be exstipulate,—another misstatement, as all *Turneraceæ* have stipules. In *Turnera ulmifolia*, Linn., —a common hot-house plant, from which most authors seem to have solely derived their knowledge of this group,—they are, on account of the hairy covering of the stem, hardly visible, but in the more glabrous species, such as *T. salicifolia*, St. Hil., they are plainly to be seen, and in *Erblichia odorata*, Seem., they are still more manifest. The calyx is, in *Turnera* and *Piriqueta*, monophyllous, in *Erblichia* pentaphyllous. The latter is doubtless the normal state of the calyx of the Order, for if the calyx of the two former is examined, it will be found that its lobes are in fact true sepals, traceable to the very base, and but slightly connected with each other. The petals and stamens are stated to be inserted into the tube of the calyx, but if examined closely they will be found, although attached to the calyx, to be traceable to the stalk of the ovary. In *Erblichia*, which has no calycinal tube, and where the petals and stamens are free to their very basis, this mode of insertion becomes still more apparent. Indeed if the insertion was different from what I have stated it to be, we should have to remove *Turneraceæ* from their hypogynous alliances, where they now stand, and place them among the perigynous orders, with which they seem to have no connection,—a change which those who follow the views of Lindley, as laid down in his 'Vegetable Kingdom,' would be compelled by logic to adopt. The petals of *Turnera* and *Piriqueta* are without appendices, but those of *Erblichia* are furnished at their base with filamentous processes, analogous to the corona of the true Passion-flowers. The stigmas of *Piriqueta* and *Turnera* are more or less flabellate; those of *Erblichia*, although having a tendency to become so, are capitate, and merely fimbriated on the margin; while it must be borne in mind that the stigmas of several *Passifloraceæ* have a tendency to become divided, and occasionally bilobed.

Turneraceæ then are intimately connected with *Passifloreæ*, especially with the tribe *Paropsieæ*. The connecting link between them appears to be *Erblichia*, one of those peculiar genera, the discovery of which will always produce great changes. As no other points of difference, besides those already disposed of, seem to exist between the two Orders, I have no hesitation in uniting *Turneraceæ* and *Passifloreæ* into one Natural Family, adopting the name *Passifloraceæ* for both.

It is evident that the discovery of *Erblichia*, and the consequent union of *Turneraceæ* and *Passifloreæ*, throw a new light upon several disputable points regarding the floral envelope of the latter, and strengthens the views of Lindley, who regards the outer floral envelopes as calyx, the inner as corolla, and the corona as a peculiar kind of petals.

448. Passiflora *cirrhiflora*, Juss., De Cand. Prodr. vol. iii. p. 323. Volcano of Chiriqui, Veraguas; also collected by Goudot in the southern parts of New Granada.

449. Passiflora *holosericea*, Linn., De Cand. Prodr. vol. iii. p. 323. Volcano of Chiriqui, Veraguas.

450. Passiflora *pubescens*, H. B. K., De Cand. Prodr. vol. iii. p. 324. Dark forests about San Lorenzo, Province of Veraguas.

451. Passiflora *coriacea,* Juss., De Cand. Prodr. vol. iii. p. 324. About Panama.

451*. Passiflora *suberosa,* Linn., De Cand. Prodr. vol. iii. p. 325. Forests of Veraguas.

452. Passiflora *biflora,* Lam., De Cand. Prodr. vol. iii. p. 326.—Nomen vernacul. "Ñorbo." Climbing over the shrubs in savanas; common in the Province of Panama, and also cultivated in gardens on account of its odorous flowers.

453. Passiflora *quadrangularis,* Linn., De Cand. Prodr. vol. iii. p. 328.—Nomen vernacul. "Granadilla." On the outskirts of woods, Veraguas; and cultivated in gardens on account of its edible fruit.

454. Passiflora *albida,* Ker, De Cand. Prodr. vol. iii. p. 328. Banks of the Rio Grande de Panama; Chagres (Fendler).

455. Passiflora *fœtida,* Cav., De Cand. Prodr. vol. iii. p. 331.—Nomen vernacul. "Guate-guate." Woods of the Province of Panama.

456. Tacsonia *sanguinea,* De Cand. Prodr. vol. iii. p. 334. Common in all the woods of Darien, Panama, and Veraguas.

457. Erblichia *odorata,* Seemann (Tab. XXVII.). Char. Gen.—*Calyx* coloratus, deciduus, 5-phyllus, foliolis æqualibus, per æstivationem contortis, anticum et posticum exteriora, tria lateralia interiora. *Corollæ petala* 5, hypogyne inserta, calycis foliolis alterna, æqualia, obovato-oblonga, basi filamentis brevibus coronata, per æstivationem contorta, decidua. *Stamina* 5, hypogyne inserta, inclusa; *filamenta* libera, æqualia, complanato-subulata; *antheræ* introrsæ, erectæ, biloculares, longitudinaliter dehiscentes. *Ovarium* sessile, liberum, uniloculare, placentis parietalibus tribus nerviformibus. *Ovula* plurima, anatropa. *Styli* 3, terminales, indivisi v. rarius subdivisi; *stigmata* capitata, fimbriata. *Capsula* unilocularis, trivalvis, valvis medio seminiferis. *Semina* plurima, ovato-oblonga, recta.—Arbor 20–30-*pedalis,* ligno *albido;* foliis *alternis, petiolatis, oblongo-lanceolatis, acuminatis, serratis, eglandulosis;* stipulis *lateralibus, geminis, minimis, marcescentibus;* floribus *axillaribus, solitariis, pedunculatis;* pedunculis *infra medium articulatis, bibracteolatis;* bracteolis *subfoliaceis, serratis;* corollis *amplis, flavis, odoratis.* On the outskirts of woods, Paredez Islands, coast of southern Veraguas.

The genus *Erblichia* I have named in commemoration of my friend Ch. Erblich, Esq., of Hannover, who, as one of the managers of the Royal Gardens at Herrenhausen, has shown himself devotedly attached to botany, and was one of the first who gave me a taste for, and encouraged my study of that science.

Plate XXVII. Fig. 1, petal; 2, ovary and styles; 3, ovary; 4, the same cut open:—*all magnified.*

458. Turnera *ulmifolia,* Linn., De Cand. Prodr. vol. iii. p. 346. Very common in savanas and on roadsides all over the country.

459. Turnera *salicifolia,* St. Hil., Wlprs. Rep. vol. ii. p. 229.—*T. Hindsiana,* Benth. Bot. Sulph. p. 101.—*Corchorus grandiflorus,* Spring in Mart. Herb. Fl. Brasil. no. 121! Hacienda de Cocoli, Province of Panama.

This shrub often attains the height of 6–8 feet, and seems to be common on the whole South American continent. It was found by St. Hilaire in the central parts of Brazil, and again at Rio Janeiro by Martius, Gardner (no. 5472 and no. 834), Graham, and Forbes; Tweedie collected it in the Southern

provinces of that empire. Spring, apparently from imperfect materials, referred it to *Corchorus*, a mistake the more excusable, as this *Turnera* has very much the look of some *Tiliaceæ*.

LOASEÆ.

460. Mentzelia *aspera*, Linn., De Cand. Prodr. vol. iii. p. 343. On rocks, old walls, and on the roofs of houses, in and about Panama.

PORTULACEÆ.

461. Portulaca *oleracea*, Linn., De Cand. Prodr. vol. iii. p. 353. In waste places about Panama.

CACTEÆ.

462. Cereus *variabilis*, Pfr., Salm-Dyck Cact. in Horto Dyckens. cultæ ann. 1849, p. 49.—*C. Pitajaya*, De Cand. Prodr. vol. iii. p. 466.—Nomen vernacul. "Pitajaya." Common on the sea-shore.

Used for making hedges.

463. Phyllocactus *Phyllanthus*, Salm-Dyck, l. c. p. 56.—*Cereus phyllanthus*, De Cand. Prodr. vol. iii. p. 469.—Nomen vernacul. "Pitajaya de monte." In forests, growing epiphytically on trees.

464. Opuntia sp.—Nomen vernacul. "Tuna." Common all over the country.

This plant is used for making hedges; the stem laid upon wounds is said to have beneficial effects; the fruit is eaten.

465. Peirescia *Bleo*, De Cand. Prodr. vol. iii. p. 475.—Salm-Dyck, l. c. p. 76.—Nomen vernacul. "Ñaju de espino." In shady woods, at Panama, Hacienda de Juan Lanas, Cupica, and Puerto de Piñas.

The leaves of this tree, either boiled or fresh, are eaten as salad.

UMBELLIFERÆ.

466. Hydrocotyle *umbellata*, Linn., De Cand. Prodr. vol. iv. p. 60. On rivulets near Panama.

467. Eryngium *fœtidum*, Linn., De Cand. Prodr. vol. iv. p. 94.—Nomen vernacul. "Culantra." Common in the savanas all over the country; also cultivated in the gardens as a pot-herb.

This herb was found in Jamaica (Bancroft), St. Vincent (Guilding), Surinam (Hostmann), Demerara (Parker), Berbice (Schomburgk), at Pernambuco (Gardner), Bahia (Salzmann), Goyaz (Gardner), and some place in Columbia (Hartweg). In the Isthmus it is considered as an indispensable ingredient in all the soups and sancoches.

ARALIACEÆ.

468. Panax *speciosum*, Willd., De Cand. Prodr. vol. iv. p. 254.—Nomen vernacul. "Pavo." In

the savanas, growing in company with Cecropias; common both in the Province of Panama and Veraguas.

469. Hedera *arborea*, Sw., De Cand. Prodr. vol. iv. p. 262.—Nomen vernacul. "Vaquero." In the savanas, found from Panama to David.

470. Hedera *pendula*, Sw., De Cand. Prodr. vol. iv. p. 262. On rivulets at Cape Corrientes, Darien.

471. Hedera *Xalapensis*, De Cand. Prodr. vol. iv. p. 264. Volcano of Chiriqui, Veraguas.

LORANTHACEÆ.

472. Viscum *tereticaule*, De Cand. Prodr. vol. iv. p. 280.—*V. sauruoides*, De Cand. l. c.!—*V. dimidiatum*, Miq. Linnæa, vol. xviii. p. 58! Common all over the Isthmus.

This is certainly one of the most widely diffused and variable species of *Viscum*, extending its range from the southern parts of Brazil to Mexico, and over the West India Islands, and assuming almost every form of leaf; the leaves however are always shortly petiolated or sessile, and very thick in their texture.

473. Viscum *Kunthianum*, De Cand. Prodr. vol. iv. p. 283. Common throughout the country.

474. Loranthus *avicularis*, Mart., De Cand. Prodr. vol. iv. p. 289. Neighbourhood of Panama.

475. Loranthus *syringæfolius*, Mart., De Cand. Prodr. vol. iv. p. 290. Cape Corrientes, Darien.

476. Loranthus *polyrhizos*, Mart., De Cand. Prodr. vol. iv. p. 290. Near Panama.

The flowers of the three above-mentioned species are greenish-white.

477. Loranthus *rhynchanthus*, Benth., Wlprs. Rep. vol. v. p. 939. In Veraguas, and the western parts of the Province of Panama, generally growing upon *Spondias Mombin*.

Bentham considers this species distinct from *L. calyculata*, De Cand., but I do not think it more than a mere variety or even form of it. The branches are often round; the size and shape of the leaves is subject to great variation, and the corymb of the flowers is, according to age and station of the plant, more or less developed. I therefore agree with Hooker and Arnott in considering it specifically identical with *L. calyculatus*, De Cand.

478. Loranthus *Jacquini*, De Cand. Prodr. vol. iv. p. 308. Hacienda de San Juan, Veraguas, growing upon *Curatella Americana*.

The leaves of this beautiful species are sometimes disposed to four in whorls (*folia quaternata*), giving it a peculiar aspect, which at first induced me to consider this form a separate species, particularly as Linden had gathered specimens of it in other parts of New Granada (Nos. 704 and 1348) with leaves arranged in the same way; subsequent examination convinced me that this arrangement of the leaves was abnormal.

479. Loranthus *densiflorus*, Benth., Wlprs. Rep. vol. ii. p. 444. Volcano of Chiriqui, Veraguas.

The three last-named species have scarlet flowers, more or less tipped with yellow, rendering them very ornamental; indeed, there can hardly be finer plants than many species of *Loranthus* inhabiting tropical and subtropical countries, yet we never find them in any of our European gardens. Imagine a dense grove of Misseltoes bearing, instead of the insignificant green flowers of our common *Viscum album*, Linn., blossoms of the brightest scarlet or yellow, and often averaging more than eight inches in length! Such are the

species of *Loranthus* alluded to, which, to render them still more worthy of the attention of the horticulturist, do not in most cases grow on the top of high trees, where their beauty would be almost concealed to the naked eye, and their charms in a great measure lost, but upon low shrubs, and often so near the ground, that several botanists have been induced to consider them terrestrial plants. But about their parasitism there can be no doubt. Griffith once thought that he found a terrestrial *Loranthus* (referred to in his Itiner. Notes, p. 63, No. 961); and writing at Myrung, he says: "The vegetation of the hills about here is much the same as about Moflong. . . . The most curious tree is one which, with the true appearance of an *Elæagnus*, seems to be a *Loranthus*, the first arborescent species yet found, although, as one or two other exceptions occur to parasitism, there is no reason why there should not be a terrestrial arborescent species, as well as a fruticose one." (*Griff. Journ. of Trav. in Ass. etc., p.* 165.) However, when Dr. J. D. Hooker and Dr. T. Thomson visited the neighbourhood of Myrung, in the Khasia mountains, the locality where that author met with the strange species, they observed an *Elæagnus* with a *Loranthus* upon it, the leaves of both resembling each other in a remarkable degree, making it highly probable that a parasite growing in a similar manner gave rise to the very pardonable mistake of Griffith. Other anomalies of the same nature may doubtless be cleared up by a similar course of investigation. I have seen several species of *Loranthus* with aerial roots, but never one of the roots penetrating into the ground; and those roots I have only observed in climbing species having long slender branches, where they replace in a great measure the cirrhi, or hooks, with which climbing plants are generally furnished.

LONICEREÆ.

480. Sambucus *Mexicana,* Presl, De Cand. Prodr. vol. iv. p. 322.—*S. bipinnata,* Cham. et Schlecht., Linnæa, vol. v. p. 171!—*S. lucida,* Tausch, Flora, vol. xxi. p. 737!—Nomen vernacul. "Zauco." Island of Taboga, Province of Panama; probably introduced.

This species, which appears to be common in Mexico, and was also found by Guilding in St. Vincent, one of the West India Islands, comes close to *S. Canadensis*, Linn., from which it is distinguished by having hairs upon the leaves, and being destitute of glands at the base of the primary segments of the leaves. Future investigations must show whether these characters can be relied upon, and whether the two species are really distinct. *S. Canadensis* is met with in California, close to Mexico, and the glands are not always present in that species.

RUBIACEÆ.

Suborder I. Cinchonaceæ.

Pentagonia, Benth. Char. Gen. emend.—*Calyx* tubo turbinato vel tubuloso, cum ovario connato, limbi superi 5–6-fidi lobis persistentibus. *Corolla* supera, infundibuliformis vel tubulosa, tubo tereti, limbo calycem longiore, extus glabro vel pilosiusculo, intus tomentoso vel pubescente, limbi 5- vel 6-fidi laciniis ovatis acutis, æstivatione valvatis. *Stamina* 5 vel 6, infra medium tubi inserta, inclusa; filamenta filiformia; antheræ lineares. *Discus epigynus* cupulæformis. *Ovarium* inferum, biloculare. *Ovula* plurima. *Bacca* ovata, calycis limbo coronata, corticata, pulposa.—Arbusculæ *Americæ tropicæ, inermes, robustæ,* ramis ramulisque *crassis, obtuse tetragonis;* foliis *oppositis, petiolatis,* petiolis *nudis, alatis vel auriculatis, integerrimis vel pinnatifidis! supra glabris, subtus sæpe pubescentibus,* stipulis *utrinque solitariis, lanceolatis, acuminatis;* floribus *bracteatis,* corymbis *axillaribus brevissime pedunculatis multifloris confertis,* calycibus corollisque *coloratis vel viridibus.*

—Benth. Bot. Sulph. p. 105. t. 39.—Wlprs. Rep. vol. vi. p. 61.—Seem. in Hook. Journ. and Kew Gard. Misc. vol. i. p. 187.—Seem. MS. in Wlprs. Ann. Bot. vol. ii. p. 798.

Bentham, in establishing *Pentagonia*, having merely specimens with very young fruit, and thinking that the latter was a capsule, placed it among *Rondeleticeæ;* but as this genus has a berry, the inside of which is edible, it belongs to *Gardenieæ* (§ *Eugardenieæ*), a tribe, many members of which (*Genipa*, *Posoqueria*, etc.) have an edible fruit. *Pentagonia* is one of the most interesting of the whole Order to which it belongs, being the only Rubiaceous genus with pinnatifid leaves as yet known, and forming on that account the best transition that has hitherto been traced to *Lonicereæ*, in which pinnatifid leaves and a baccate fruit are common features: it is composed of three species, one with entire leaves (discovered by Barclay), and two with pinnatifid ones (discovered by myself): all three species are well distinguished from each other, and they are equally distributed over the Isthmus. *P. macrophylla*, Benth., grows in the province of Panama, generally as underwood in Palm-forests; *P. Tinajita*, Seem., in that of Veraguas; while *P. pinnatifida*, Seem., is found in the territory of Darien.

481. Pentagonia *macrophylla*, Benth.; pentamera, foliis ovalibus vel ovali-oblongis apice obtuse angustatis margine integerrimis, petiolis nudis, calyce turbinato, corolla infundibuliformi.—Benth. Bot. Sulph. p. 105. t. 39! Forests between Panama and Cruces, province of Panama.

A small tree about 10 feet high; leaves acute or rounded, almost cordate at the base, and either glabrous or pubescent on their under surface, 1 to 2 feet long; calyx red; corolla greenish.

482. Pentagonia *Tinajita*, Seem. (Tab. XXVIII.); pentamera, foliis pinnatifidis in petiolum alatum decurrentibus utrinque glabris, calyce turbinato, corolla infundibuliformi, bacca eduli. —Seem. in Hook. Journ. et Kew Misc. vol. i. p. 187.—Seem. Volksnam. der Amer. Pfl. p. 46.—Nomen vernacul. "Tinajita." Western parts of Veraguas.

A small tree about 10 feet high; leaves from 2 to 3 feet long, and from 6 to 12 inches broad; calyx green; corolla red; fruit ovate, resembling in shape the water-jars (*tinajas*) commonly used in Veraguas, hence the vernacular name; the berry, which is eaten by the inhabitants, has an insipid flavour.

Plate XXVIII. Fig. 1, a whole flower, after the stamens have fallen off; 2, the same cut open; 3, ovary; 4, the same cut open; 5, fruit; 6, 7, seeds:—nos. 3, 4, 6, and 7 *slightly magnified.*

483. Pentagonia *pinnatifida*, Seem.; pentamera vel hexamera, foliis pinnatifidis pubescentibus vel demum glabratis, petiolis basi auriculatis, calyce tubuloso, corolla tubulosa.—Seem. in Hook. Lond. Journ. Bot. vol. vii. p. 566. t. 17, 18. On the banks of the river Cupica, Darien.

A small tree about 10 feet high; leaves, when fully developed, about 3 feet long, and 18 inches across; calyx green; corolla red.

484. Posoqueria *latifolia*, Roem. et Sch., De Cand. Prodr. vol. iv. p. 375.—*P. Panamensis*, Wlprs. Ann. vol. ii. p. 797!—*Stannia Panamensis*, Wlprs. et Duchass. in Linnæa, vol. xxiii. p. 755! —Nomen vernacul. "Boca vieja." Woods between Panama and Cruces; Bay of Utria in Darien; David, Veraguas.

The fruit is eaten by the inhabitants, but has a very poor flavour.

485. Genipa *Caruto*, H. B. et K., De Cand. Prodr. vol. iv. p. 378.—Nomen vernacul. "Jagua." In the savanas of Panama and Veraguas.

The fruit has an acid flavour, and is eaten; it contains a violet juice, which is used for dyeing. (Compare Örsted's 'Centralamerikas Rubiaceer,' p. 32.)

486. Sommera *arborescens,* Schlecht., Wlprs. Rep. vol. vi. p. 77. Volcano of Chiriqui, Veraguas.

The genus *Sommera,* having a berry, has to be classed amongst the *Gardenieæ.*

487. Amaioua *Guianensis,* Aubl., De Cand. Prodr. vol. iv. p. 369.—Nomen vernacul. "Madroño torcido." Forests of Veraguas.

The stem is deeply furrowed; the wood is much esteemed by carpenters for building purposes. I have also reason to believe that the wood sold in Panama under the name of "Madroño de montaña" is the produce of this tree.

488. Randia *monantha,* Benth., Wlprs. Rep. vol. ii. p. 518.—Nomen vernacul. "Flor de espino blanco." Capira, Province of Panama.

489. Coccocypselum *canescens,* Willd., De Cand. Prodr. vol. iv. p. 397. Woods near Panama.

490. Higginsia *psychotriæfolia,* Benth. in Oerst. Centr. Rubiac. p. 28. Woods of Darien.

491. Buena *macrocarpa,* Benth., Bot. Sulph. p. 104. t. 38. Cape Corrientes, Darien.

492. Lasionema *glabrescens,* Benth., Bot. Sulph. p. 105. Banks of the river Chagres.

A tree from 30 to 40 feet high, with flowers a most beautiful rose-colour, closely allied to *L. rosea.*

493. Manettia *cuspidata,* Bert., De Cand. Prodr. vol. iv. p. 363. Common about Panama.

This creeper has been collected at Santamarta (Purdie), Teapa (Linden), and in the Islands of Trinidad (Lockhart), and St. Vincent (Guilding).

494. Calycophyllum *coccineum,* De Cand. Prodr. vol. iv. p. 367.—*Warszewiczia pulcherrima,* Klotzsch in Monatsbericht der K. Akademie der Wissensch. in Berlin pro August, 1853!—Cape Corrientes, Darien; Canton of Alanje, Veraguas (Warszewicz).

The leaves of this beautiful plant are sometimes $2\frac{1}{2}$ feet long, and 14 inches across.

495. Calycophyllum *tubulosum,* De Cand. Prodr. vol. iv. p. 367. Banks of the river Chagres, growing in company of *Lasionema glabrescens,* Bth.

This splendid species, which was collected in Peru (Maclean), and Venezuela (Funke), is a tree about 30 feet high; its bract-like sepal is of a bright scarlet, and its corolla of a fine purple colour; altogether this is one of the most ornamental plants of the Isthmus

496. Condaminea *corymbosa,* De Cand. Prodr. vol. iv. p. 402. Montaña de Chorcha and Volcano of Chiriqui, Veraguas.

497. Macrocnemum *Jamaicense,* Linn., De Cand. Prodr. vol. iv. p. 403. Cape Corrientes, Darien.

My plant is intermediate between the form generally accepted as *M. Jamaicense,* and that described by Örsted as *M. exsertum;* the anthers are linear, and exserted.

498. Rondeletia *versicolor,* Hook. Bot. Mag. t. 4579. Volcano of Chiriqui, Veraguas.

A shrub from 12 to 15 feet high; bark extremely bitter, and may perhaps be used as a febrifuge; leaves from 4 to 5 inches long, and from 2 to 3 inches broad; flowers of a fine rose-colour, much darker than those figured in the 'Botanical Magazine,' from plants which were grown in a hothouse, where they had become pale, and in some instances almost white.

499. Rondeletia *laniflora,* Benth., Wlprs. Rep. vol. ii. p. 505. Volcano of Chiriqui, Veraguas. Collected in Mexico by Jurgensen and Linden.

500. Rondeletia *Panamensis,* De Cand. Prodr. vol. iv. p. 408.—*R. eriantha,* Benth. Pl. Hartweg. p. 192. no. 1051! Punta Gordo, and Piñas Bay, Darien; Panama (Hænke).

Found in Venezuela by Funke, and in the Province of Bogotá, New Granada, by Hartweg. Leaves rounded or acute at the base, almost sessile or with long petioles.

501. Sipania *palustris,* Seem.; caule hirsuto basi repente, foliis ternis sessilibus ovato-lanceolatis acutis glabris, floribus in dichotomia solitariis sessilibus, laciniis calycinis lineari-lanceolatis acutis bi-aristatis, corolla glabra vel intus subpuberula, capsula subrotunda, setoso-pilosa. In swamps, near Panama, growing together with *Noterophila inundata,* Mart.

A perennial herb, about 8 inches high; leaves 4 lines long, and about 1 line broad; flowers rose-coloured and smaller than in any other species of *Sipania* known to me, about $1\frac{1}{2}$ lines across.

502. Gonzalea *Panamensis,* Pers., De Cand. Prodr. vol. iv. p. 437. Outskirts of woods about Panama.

503. Isertia *spicæformis,* De Cand. Prodr. vol. iv. p. 437. Woods of Darien.

504. Alibertia *edulis,* Rich., De Cand. Prodr. vol. iv. p. 443. Nomen vernacul. "Madroño de comer." Outskirts of woods, generally diffused over the whole Isthmus.

The fruit of this shrub is eaten by the inhabitants; it has an agreeable flavour.

505. Hamelia *patens,* Jacq., De Cand. Prodr. vol. iv. p. 441. Panama (Barclay, Hinds).

506. Sabicea *glabrescens,* Benth., Wlprs. Rep. vol. ii. p. 489. Bay of Cupica, Darien.

Suborder II. Coffeaceæ.

507. Nonatelia *Panamensis,* De Cand. Prodr. vol. iv. p. 466. Panama (Hænke).

508. Malanea *erecta,* Seem.; fruticosa, erecta, ramulis, petiolis, paginis inferioribus foliorum, rachidibus calycibusque adpresso-pilosis demum glabratis, foliis ovato-ellipticis utrinque acuminatis, stipulis subfoliaceis ovato-oblongis acutis, paniculis axillaribus, bracteis linearibus, floribus breviter pedicellatis, laciniis calycinis acutis, corollæ extus glabræ intus villosæ laciniis ovatis acutis æstivatione valvatis, antheris linearibus, ovario 2-loculari, ovulis solitariis ab apice pendulis, drupa ovato-oblonga glabra pyrena 2-loculari. Island of Taboga, Bay of Panama.

An erect shrub, from 4 to 8 feet high; branches, when young, almost quadrangular, ultimately round; leaves from 3 to 4 inches long, and about 2 inches broad, shining, their under surface much paler than the upper; stipules much longer than the petiole; flowers white.

509. Morinda (§ Roioc) *Panamensis,* Seem.; ramulis tetragonis foliisque glabris, foliis ovatis vel ovato-oblongis utrinque acutis vel apice acuminatis, stipulis subtriangularibus acutis petiolum multo brevioribus, capitulis aggregatis multifloris, calyce breviter 5-dentato glabro, corolla extus puberula intus villosa, laciniis 5-linearibus acutis, stigmate bifido stamina multo superante et corolla paulo breviore, baccis concretis in massam globosam. Chagres, Province of Panama (Fendler, no. 148).

A small tree, with leaves from 6 to 7 inches long, and about 4 inches broad, closely allied to *M. citrifolia,*

Linn., which I collected in the Sandwich Islands, but easily distinguished from that species by the stipules, being acute and much shorter than the petioles; anthers longer than the tube of the corolla.

510. Declieuxia *Mexicana,* De Cand. Prodr. vol. iv. p. 479. Savanas about Panama.

511. Chiococca *phænostemon,* Schlecht. Linnæa, vol. ix. p. 594. Cape Corrientes, Darien.

512. Chiococca *racemosa,* Jacq., De Cand. Prodr. vol. iv. p. 482. From Panama to David, and also in the Paredez Islands.

513. Chomelia *tenuiflora,* Benth., Wlprs. Rep. vol. ii. p. 942. In the savanas about Panama.

A shrub about 10 feet high, distributed over Peru (Mathews), Brazil (Claussen), British and Dutch Guiana (Schomburgk, Forke), and New Granada (Purdie, Seemann).

514. Coffea *Arabica,* Linn., De Cand. Prodr. vol. iv. p. 499.—Nomen vernacul. "Café." Cultivated.

The Coffee-tree is cultivated to a considerable extent in the neighbourhood of the town of David in Veraguas, and the village of Capira in Panama; it grows extremely well, but the berries, ripening during the wet season, have to be dried by artificial heat, which deprives them in a great measure of their aroma, renders them of inferior value in the market, and does not afford much encouragement for a more extensive cultivation of the tree than that going on at present.

515. Psychotria *conferta,* Benth. Bot. Sulph. p. 107. Southern parts of Darien; also found by me in the Bay of Choco, and the island of Tumaco.

516. Psychotria *alba,* Ruiz et Pav., De Cand. Prodr. vol. iv. p. 508. Woods about Panama.

517. Psychotria *Nicaraguensis,* Benth. in Örst. Centr. Amer. Rubiac. p. 12. Woods about Cruces.

518. Psychotria *longistipula,* Benth., Wlprs. Rep. vol. ii. p. 474. Bay of Cupica, Darien.

519. Psychotria *micrantha,* H. B. K., De Cand. Prodr. vol. iv. p. 507. Woods of Cruces.

520. Psychotria *furcata,* De Cand. Prodr. vol. iv. p. 512. Panama (Hænke), not collected by me.

The *Psychotrias* are in the Isthmus always found as underwood in the forests; they are all insignificant-looking plants. Besides those here enumerated, Fendler collected several species at Chagres, and I one which could not be satisfactorily determined for want of good specimens.

521. Palicourea! *parviflora,* Benth. Bot. Sulph. p. 107. Savanas about Panama; Island of Coyba, Veraguas.

A shrub from 5 to 8 feet high; corolla at the base distinctly curved (a proof that this species is a true *Palicourea*), and of a red colour, more or less tinged with yellow.

522. Palicourea *Mexicana,* Benth. in Örst. Cent. Amer. Rubiac. p. 15. Volcano of Chiriqui, Veraguas.

This fine species spreads from Veraguas over the States of Central America (Örsted), and thence to Mexico (Liebmann, Linden, Galeotti).

523. Palicourea *Guianensis,* Aubl., De Cand. Prodr. vol. iv. p. 530. Southern Darien.

This was also found in the islands of Gorgona (Barclay) and Tumaco (Seemann).

Palicourea longibracteata, De Cand., was collected at Panama by Hænke, but by no other collector.

524. Cephaelis *tomentosa*, Willd., De Cand. Prodr. vol. iv. p. 533. Dark woods about Cruces; Chagres (Fendler, no. 177).

A shrub about 10 feet high, bearing blue berries. It was found in Mexico (Jurgensen, Linden), Island of Trinidad (Schacht, Lockhart), New Granada (Linden, Turner), Surinam (Hostmann), British Guiana (Parker), Peru (Mathews), Island of Gorgona (Barclay).

525. Cephaelis (§ Callicocca) *psychotriæfolia*, Seem.; fruticosa, ramis bifurcatis tetragonis rufo-tomentosis demum glabratis, foliis obovato-oblongis basi cuneatis apice breviter acuminatis margine ciliatis, stipulis apice bifidis, capitulis pedunculatis, pedunculis terminalibus simplicibus vel trifidis, involucro polyphyllo, phyllis ovato-lanceolatis longe acuminatis fimbriato-ciliatis basi connatis, floribus 5-meris, lobis calycinis lanceolatis acutis basi brevissime connatis, corollæ tubo brevi-intus medio villoso, bacca glabra. In dense forests near Cruces, Province of Panama, and Chirambira, Darien.

A low shrub; leaves from 4–5 inches long and about 2 inches broad; when young, on the under surface slightly pubescent, on the upper surface always glabrous; stipules more or less connected, membranaceous, ciliated on the margin and deeply forked at the apex, about 1 inch long; flowers minute, about $1\frac{1}{2}$ line long, greenish; style bifid; ovules solitary.—This species appears to be related to *C. hirta*, Miq. (Linnæa xvii. p. 71) and *P. bidentata*, Thunb.

526. Cephaelis *violacea*, Willd., De Cand. Prodr. vol. iv. p. 534. Southern Darien; also in the Bay of Choco.

527. Geophila *reniformis*, Cham. et Schlecht., De Cand. Prodr. vol. iv. p. 537. Woods near Panama.

528. Mitracarpium *schizangium*, De Cand. Prodr. vol. iv. p. 572. Savanas about Panama.

529. Richardsonia *scabra*, St. Hil., De Cand. Prodr. vol. iv. p. 567. Sunny places about Panama.

530. Diodia *setigera*, De Cand. Prodr. vol. iv. p. 563. Common in the savanas about Panama.

Flowers white or slightly tinged with red, never blue, as stated by De Candolle.

531. Diodia *articulata*, De Cand. Prodr. vol. iv. p. 564. Bay of Cupica, Darien; also collected by me in the Bay of Choco.

532. Spermacoce *tenuior*, Linn., De Cand. Prodr. vol. iv. p. 552. Island of Cacagual, Southern Darien.

533. Borreria *parviflora*, Meyer, De Cand. Prodr. vol. iv. p. 544.—*B. ramisparsa*, De Cand. l. c.!—*B. prostrata*, Miq., Stirp. Sur. p. 177 (fide spec. in Herb. Hook.!)—Örsted, Centr. Rubiac. p. 5! Widely diffused over the Isthmus.

534. Borreria *Hænkeana*, De Cand. Prodr. vol. iv. p. 547. From Panama to David; also on the Volcano of Chiriqui, Veraguas.

535. Rubia *hypocarpia*, De Cand. Prodr. vol. iv. p. 591.—Örst. Centr. Rubiac. p. 4. Volcano of Chiriqui, Veraguas.

536. Galium (§ Trichogalia !) *Caripense*, H. B. K., De Cand. Prodr. vol. iv. p. 612. Volcano of Chiriqui, Veraguas.

A perennial plant, bearing white flowers.

COMPOSITÆ.

(*Auctore J. Steetz.*)

Tribus I. Vernoniaceæ.

537. Vernonia (Lepidaploa, § 3) *patens*, H. B. K., Nov. Gen. et Sp. tom. 4. p. 41. no. 18.—De Cand. Prodr. tom. 5. p. 39. no. 137. Savanas about Panama.

This species is closely allied to the Brazilian *V. polyanthes* of Lessing, but well characterized by that author in the Linnæa, tom. 6 (1831), p. 652 et 653. The pappus however in both species, as I observed in original specimens of both, is most fragile, and light-ferruginous.

538. Vernonia (Lepidaploa, § 3) *canescens*, H. B. K., Nov. Gen. et Sp. tom. 4. p. 35. no. 5. tab. 317.—*V. geminata*, H. B. K. l. c. no. 6. (non Lessing).—De Cand. Prodr. tom. 5. p. 40. no. 147. —Lessing in Linnæa, tom. 6 (1831). p. 657. no. 75 *a*.

Var. *β. micrantha*, Lessing in Linnæa, tom. 6 (1831). p. 657. no. 75 *β*.—De Cand. l. c. p. 41. no. 147 *β*.—*V. micrantha*, H. B. K. l. c. p. 37. no. 9. Savanas about Panama.

This species is very variable, chiefly in the size and shape of the leaves; and the three so-called species of H. B. K. must be considered as mere varieties of one. Dr. Seemann's specimens accord well with Kunth's description of *V. geminata;* the leaves, having an obtuse base, and a long acuminate point, are on the upper surface rugose, slightly pubescent and somewhat scabrous, on the under surface softly tomentose and almost sericeous; the large leafy and cymose panicle has very slender branches. The silver-coloured pappus and sericeous achænia are the same in all three varieties. The Brazilian *V. geminata*, Lessing, however, of which I have seen an original specimen gathered by Sellow, is well distinguished by the squarrose tips of the involucral scales, which are appressed in our plant, and by the somewhat yellowish pappus.

539. Vernonia (Lepidaploa, § 4) *Seemanniana*, Steetz; fruticosa, ramis obsolete angulatis pubescenti-canescentibus, foliis alternis breviter petiolatis ovato-lanceolatis basi obtusis apice acuminatis margine recurvo integerrimis coriaceis penninerviis utrinque glabriusculis, cyma scorpioidea ramosa, capitulis sessilibus 40–45-floris folio stipatis, involucri campanulati squamis adpressis coriaceis arachnoideis exterioribus acutis interioribus obtusis, corollis glabris, achæniis dense hirsutis, pappi rigidi argentei serie exteriore paleacea brevi. Volcano of Chiriqui, Veraguas.

Frutex, ut videtur, scandens. *Folia caulina inferiora* in specimine unico, quod suppetit, 4–5-pollicaria, medio $1\frac{3}{4}$ pollices lata (*superiora* multo minora et subito in parva bracteæformia decrescentia), *petiolo* crasso basi paullisper dilatato velutino 2–3 lineas longo insidentia, venosa, subtus glandulis resinosis flavis undique punctata, nervo medio crasso venisque subtus valde prominentibus utrinque pubescentibus, cæterum in utraque pagina glabra. *Cymæ rami* conferti, alterni, recurvati, tenues, pubescenti-canescentes, 6–10-cephali; *capitula* secunda, 4–9 lineas dissita, 4 lineas alta, inferiora folio florali 1–2-pollicari, sequentia folio sensim minore semipollicari 3–4 lineas lato, summa foliolo lineari bracteæformi capitulo 3–4-plo breviore suffulta. *Involucrum* campanulatum, floribus brevius sed pappo subæquilongum, imbricatum, circiter 5-seriale; *squamis* coriaceis, nigre-

scentibus, arachnoideis, exterioribus brevioribus adpressis, semilanceolatis, nervo medio crasso percursis, acutis, intimis longioribus, lineas 3 æquantibus, apice obtuso patentibus, oblongis, semilineam latis. *Receptaculum* nudum, tuberculatum. *Corolla* glabra, ut in sicco videtur albida; laciniis limbi 5-fidi angustis, gracilibus, acutiusculis, recurvis, vix tertiam totius corollæ partem metientibus. *Filamenta* antheris duplo fere breviora, media corolla inserta; *antheræ* basi omnino ecaudatæ, apice appendicula lanceolata acuta enervi libera auctæ, sub anthesi exsertæ. *Styli rami* modice exserti, recurvati, acutiusculi, longiuscule sed sparse hispidi. *Achænia* immatura turbinata, præter callum basilarem, pallidum, glabrum, pilis rigidis cinereis erectis dense hirsuta. *Pappus* duplex; *setis* utriusque serici splendide argenteis, *interioribus* corolla brevioribus, filiformibus, rigidis, serratis supra medium adplanatis, et versus apicem sensim attenuatis, acutis leviterque extrorsum curvatis, longitudine paullisper inæqualibus; *setis exterioribus* 3-plo brevioribus, duplo fere latioribus, paleaceis, serratis, semilanceolatis, acutis, basi connatis, longitudine latitudineque valde inæqualibus. Volcano of Chiriqui, Veraguas.

This fine species approaches the Mexican *V. Schiedeana*, Lessing, of which I have seen an original specimen in the Royal Herbarium at Berlin. But Schiede's plant is well distinguished by its leaves being more rugose and scabrous on the upper surface, and softly tomentose on the under, by the cyme being more ample, lax, and divergent, and the somewhat larger flower-heads, which give the plant a very different habit. The best, and I think more constant difference, however, is found in the scales of the involucre, being of a paler dirty-green colour, the innermost of which are much broader in their middle, often exceeding $1\frac{1}{4}$ line, passing into an attenuated but very obtuse and rounded apex, so that their shape is more oval than oblong. The achænia are more sericeous in *V. Schiedeana*, but the pappus is quite the same in both species.

540. Centratherum *punctatum*, Cassini, De Cand. Prodr. tom. 5. p. 70. no. 2.—*Ampherephis aristata*, H. B. K., Nov. Gen. et Sp. tom. 4. p. 32. no. 1. tab. 314. In savanas about Panama.

Kunth, l. c., states the corolla to be glabrous throughout. In the single specimen from Panama I have before me, the tube of the corolla is covered with fine hairs, the limb is quite glabrous; otherwise it agrees exactly with an original specimen in Kunth's Herbarium. The stem is fruticose, by which it differs from the herbaceous *C. intermedium*, Lessing.

541. Dialesta *discolor*, H. B. K., Nov. Gen. et Sp. tom. 4. p. 44, 45. tab. 320.—De Cand. Prodr. tom. 5. p. 76, 77.

Var. *polychæta*, Steetz; pappi paleis 1–6. Volcano of Chiriqui, Veraguas.

Dr. Seemann's plant accords so well with the accurate description and figure of Kunth, l. c., that it may be referred, without any doubt, to this species, though I have not seen an authentic specimen of it. The capitula are all two-flowered; the scales of the involucre, about six in number, are all distichous, just as in Kunth's plate, fig. 1; but the paleæ of the achænia vary in Dr. Seemann's plant from one to six, most of them being furnished with five or six, whilst Kunth always found but two, De Candolle, l. c., one to four. Being however most deciduous, as stated by both authors, I should think a character founded on the number of them cannot be constant. The allied *D.* (*Oliganthes*) *macrophylla* and *Schomburgkii* of C. H. Schultz Bip. (Linnæa, tom. 20 (1847) p. 503, 504), of which I have seen original specimens, certainly belong to the same genus of Kunth, but are very different species, well distinguished by their three- or four-flowered capitula, and the involucre, consisting of more, viz. ten to twelve scales, which are disposed in a somewhat tetrastichous manner. On the other hand I cannot adopt the notion of my friend Dr. Schultz, who combined, l. c., *Adenocyclus*, Lessing, and *Odontoloma*, *Dialesta*, and *Pallalesta*, H. B. K., into the genus

Oliganthes of Cassini, of which the *Pallalesta* already was reduced (and perhaps with good reason) by Lessing and De Candolle to *Vernonia*: the pappus furnishes so good, and in general so constant characters for the distinction of the genera of the difficult Order of *Compositæ*, that it seems to me dangerous to shake a foundation which proved secure, even during the most violent systematical troubles.

542. Elephantopus *mollis*, H. B. K., Nov. Gen. et Sp. tom. 4. p. 26.—De Cand. Prodr. tom. 5. p. 86. no. 4. On road-sides; common all over the country.

The different species of *Elephantopus* enumerated by De Candolle in his Prodromus, have hitherto not been well characterized. Many botanists take most of them, viz. No. 2–5, for mere varieties of the same species, and indeed they seem to be distinguished more by a different habit, than by any decided technical character. I do not know whether *E. mollis*, H. B. K., is the same plant as the North American *E. nudicaulis*, Ell., which, according to Torrey and Gray, in their excellent Flora of North America, is the genuine *E. tomentosus*, Linn., and which has a much taller habit, with glomerules about twice the size of those in our plant, and violet-purple flowers; but specimens of Dr. Seemann agree well with an authentic specimen of Humboldt, in Kunth's Herbarium. This species is distinguished by a slender habit, the almost leafless, more strigose pilose stem, the dichotomous ramification of the inflorescence, with a small bract-like leaf at every bifurcation, the leaves more softly villous underneath, the involucral leaves not longer than the glomerule, the white flowers, and particularly the pappus, of which the paleaceous portion at the base is much shorter, and more abruptly attenuated in the bristle, than in any other species of *Elephantopus*. By its scape-like stem however it is more allied in habit to *E. scaber*, Linn., than to *E. Carolinianus*, Willd.

543. Elephantosis *angustifolia*, De Cand. Prodr. tom. 5. p. 87. no. 3.—*Elephantopus angustifolius*, Swartz, Flor. Ind. Occident. tom. 3. p. 1383. In savanas about Panama, rare.

544. Distreptus *spicatus*, Cassini et Lessing, Linnæa, tom. 4 (1829). p. 327 seq. tab. 2. fig. 19, 33, 34.—De Cand. Prodr. tom. 5. p. 87. no. 1.—*Elephantopus spicatus*, B. de Juss. in Aubl. Guian. tom. 2. p. 808.—Nomen vernacul. "Chijoria." Common on road-sides and in waste places.

The double plication at the apex of the two longer and stronger bristles of the pappus, as well as the double series in the pappus of *Elephantosis*, are such constant and significant generic characters, that I cannot adopt the views of Endlicher and others, who throw *Distreptus* together with *Elephantopus*. "The Chijoria is used as a febrifuge by the Panamians."—*B. Seem.*

545. Rolandra *argentea*, Rottb. Coll. Hafn. tom. 2. p. 256.—Swartz, Flor. Ind. Occid. tom. 3. p. 1388–1390. tab. 27. fig. 2.—De Cand. Prodr. tom. 5. p. 90.—*Echinops fruticosus*, Linn.—*Echinops nodiflorus*, Lam.

546. Liabum *asclepiadeum*, C. H. Schultz Bip. Linnæa, tom. 20 (1847). p. 521. no. 27.—Wlprs. Annal. Bot. Syst. tom. 1. p. 392. no. 1. Volcano of Chiriqui, Veraguas.

This species is intermediate between *L. eriocaulon*, Pœpp. et Endl., Nov. Gen. tom. 3. p. 43. tab. 249, and *L. amplexicaule*, Pœpp. et Endl., l. c., of which I have seen authentic specimens in the Imperial Herbarium at Vienna; it approaches nearest to the latter, from which it only differs by its broader leaves, which are 3–5 inches long and 2 inches in breadth, and by the pale yellow flowers; in *L. amplexicaule*, Pœpp. et Endl., the flowers are of a fine golden colour, and the leaves of the same length, and their breadth does not exceed one inch. *L. eriocaulon*, Pœpp. et Endl., differs by its ovate leaves, rounded or even subcordate at the base, and by the great semi-ovate auricle at the base of the petiole. In *L. asclepiadeum*, C. H. Schultz Bip., the leaves are almost of the same size, but elliptical, and at the base attenuated into the petiole, which however is not always naked, but often dilated into a short truncate auricle

at the base. The inflorescence in general, and the texture, situation, nervation, and pubescence of the leaves, are similar in these three species.

547. Pectis *elongata*, H. B. K., Nov. Gen. et Sp. tom. 4. p. 262. no. 2. tab. 392.—De Cand. Prodr. tom. 5. p. 99. no. 5.—*Pectis stricta*, Willd. Herb. no. 16,139! In savanas all over the country.

548. Pectis *diffusa*, Hook. et Arn., Bot. of Beech. Voy. p. 296.—Wlprs. Rep. Bot. Syst. tom. 2. p. 545. no. 2.—*Pectis arenaria*, Benth., Bot. of Voy. Sulph. p. 110.—Wlprs. Rep. Bot. Syst. tom. 6. p. 104. no. 1. Common on the sea-side of the Pacific Ocean, especially about Cacagual in Darien.

549. Pectis *filipes*, Harvey et Gray, in Pl. Coult. Ined.—Gray, Plant. Fendl. p. 62 adnot.—Wlprs. Ann. Bot. Syst. tom. 2. p. 812. no. 2. Savanas about Panama.

I am not quite certain whether Dr. Seemann's plant is the same as Coulter's from California, of which I have not seen an original specimen: in general it agrees well with Gray's short diagnosis. It has likewise the size and aspect of *P. linifolia*, Linn., but the leaves are 1–1½ line wide, and not narrowly linear. Moreover, I find no great difference between the pappus of the ray and that of the disc, which is coroniform in both, and consists of some very short, unequal, acute paleæ, of which sometimes one or two arise in a longer antrorsely-barbed awn. In our single specimen however I have not found a mature achænium. Besides this circumstance, "the number of awns or paleæ, and the difference between the pappus of the ray and disc, in all *Pectideæ*, is variable," as remarks Asa Gray in 'Plantæ Wrightianæ,' tom. 1. p. 82 (1852).

Tribus II. Eupatoriaceæ.

Tuberostylis, Steetz, nov. gen. *Capitulum* pluriflorum, homogamum, floribus omnibus hermaphroditis. *Involucrum* campanulatum, imbricatum, *squamis* pluriserialibus inæqualibus adpressis, interioribus oblongo-lanceolatis cochleariformibus obtusis, mediis sensim decrescentibus, exterioribus multo brevioribus ovatis planis. *Receptaculum* convexum nudum. *Corollæ* tubulosæ, cylindricæ, graciles, æquales, apice breviter 5-dentatæ, involucrum superantes. *Filamenta* 5, semilineam supra basin corollæ inserta, longiuscule libera, paullo infra insertionem antherarum sursum et iterum deorsum plicata. *Antheræ* oblongæ, obtusæ, versus basin attenuatæ, ecaudatæ, apice exappendiculatæ. *Stylus* basi tuberi crasso spongioso apice emarginato insidens, filiformis, stigmatis ramis 2 elongatis recurvatis, corollam longe excedentibus, complanatis obtusis terminatus. *Achænia* obpyramidata, obtusangula, paullisper arcuata, sulcata et transverse rugosa, margine calloso angusto obliquo inæqualiter et obtuse dentato superata, cæterum calva.—Herba *prostrata, radicans, glabra;* foliis *oppositis, obovatis, in petiolum attenuatis, apice paucicrenatis, obsolete uninerviis, subaveniis, crassiusculis;* pedunculis *terminalibus et axillaribus, apice trichotomis;* pedicellis 1–3-*cephalis;* capitulis *sessilibus sive medio brevissime pedicellato,* bractea *minima suffultis, circiter* 10-*floris.*

550. Tuberostylis *Rhizophoræ*, Steetz (Tab. XXIX.). Grows epiphytically on the roots of Mangrove-trees, Southern Darien.

A plant closely allied to *Alomia ageratoides*, H. B. K., of which I have seen an original specimen in Kunth's Herbarium, but with a very different habit, which is not unlike that of some *Valerianeæ;* otherwise it differs from *Alomia* by the obovate much imbricated involucre with fewer flowers, which are not ampliated at the summit, by the inappendiculated anthers, and chiefly by the thick and spongiose tuberous callus at the base of the style.

In the single specimen I have before me, the herbaceous terete and striate stem is prostrate and rooting, fixed by thin rootlets at every internode; the rootlets descend immediately below the leaves, opposite to their axils, where they arise as little warts, or lenticellæ. In this manner the plant is enabled to fix itself to the aerial roots of the Mangrove-tree (*Rhizophora*). The obovate leaves, 6–8 lines in length and almost of the same breadth, are round at the summit, with a somewhat unequal crenate margin, and attenuated into slender petioles of about the same length; in texture they are rather fleshy; their midrib and lateral veins are very indistinct. The uppermost leaves are linear, sessile, acute, very short and bract-like, sustaining the trichotomous inflorescence. The involucre of the flower-heads is cylindrical or bell-shaped, and the scales of it are in about four or five series, of which those of the two outermost series are ovate and very short, whilst the scales of the innermost and middle series have a length of 2½–3 lines, being oblong or lanceolate. All scales are of a somewhat firm texture, three- to five-nerved, obtuse at the apex and much appressed. Each involucre contains about ten tubular perfect flowers. The style is most singular; it is not thickened at the base, as in *Brickellia*, *Skirrhophorus*, and many other *Compositæ*, but really immersed in a somewhat spongious or fleshy emarginated tuber, which is separable from the style, and often broken in four or five pieces when incautiously separated, resembling in some degree the four seed-like nucules surrounding the base of the style in the Order *Labiatæ* or *Borragineæ*. The achænia are of a yellowish or fawn colour, somewhat curved and mostly tetragonous, with obtuse angles, but sometimes trigonous with a convex back.

Plate XXIX. Fig. 1, an entire capitulum; 2, receptacle, scales, and a flower; 3, a single flower; 4, the summit of the achænium; 5, flower cut open; and 6, a stamen:—*all magnified.*

551. Cœlestina *scabriuscula*, Benth. in Örsted Compositæ Centro-Americanæ, p. 8. no. 27 (1853)*. Volcano of Chiriqui, Veraguas.

I have not seen an original specimen, collected by Örsted, but Mr. Bentham's brief and characteristic diagnosis entirely accords with Dr. Seemann's plant, so that there cannot remain any doubt that it belongs to the same species.

552. Adenostemma sp. On road-sides, Panama.

The genus *Adenostemma* needs an entire revision; many characters given in the diagnoses of the species are found to be very variable, viz. the number of the clavate bristles of the pappus and the surface of the achænia, which I found in the same specimen, the younger ones almost smooth, and the ripe ones muricate. Therefore the single specimen collected by Dr. Seemann, being in a bad condition, is not determinable. It seems however to be allied to *Adenostemma hirtiflorum*, Benth. Plant. Hartweg. p. 75. no. 531, of which I have compared an original specimen; but it differs by the tip and the teeth of the leaves being more obtuse, by the strongly muricate ripe achænia, and by the clavate bristles of the pappus varying in number from three, four, and five. On the other hand it has more the habit of *A. Humboldtii*, C. H. Schultz Bip., MSS., of which I examined a specimen, gathered by Moritz at Merida in Venezuela. But in this species the stem, peduncles, and involucre are covered with a dense glandular pubescence, whilst in Dr. Seemann's plant the stem and involucre are almost glabrous, the pedicels being covered with short and simple hairs without any gland. In the achænia of both I found no striking difference. The plant of Moritz is somewhat stouter.

553. Hebeclinium *macrophyllum*, De Cand. Prodr. tom. 5. p. 136. no. 1.—*Ageratum cæruleum*, Sieb. Martinic. no. 192! (non Desfont.). Panama, in waste places.

* Under the name, 'Compositæ centroamericanæ. Bestemmelser og Beskrivelser af G. Bentham. Ved A. S. Örsted,' has appeared a pamphlet, 49 pages in 8vo, which, being without any other title, will, I suppose, be published in the Transactions of one of the Natural History Societies at Copenhagen, probably in the 'Videnskabelige Meddelelser fra den naturhistoriske Forening i Kjöbenhavn.'

I have seen many specimens of this plant from different localities, viz., British Guiana (Rich. Schomburgk), Cayenne (Martin), Bahia (Sellow), Rio Janeiro (Gaudichaud, Sellow), Peru (Pœppig), Portorico (Wydler), Hayti (Ehrenberg), Martinique (Sieber, no. 192), etc. It is most variable in size as well as in colour and the degree of the pubescence, and even the number of flowers in the flower-heads. In the specimens from Bahia, Peru, and Portorico the pubescence of the stem, peduncles, and lower surface of the leaves is very dense and almost ferrugineous. In Dr. Seemann's plant and other specimens the pubescence is very slight, and somewhat greyish-green. The capitula are not always thirty-flowered, as stated by De Candolle; I found often fifty flowers in the involucre, and Kunth observed the same in Humboldt's specimens (cf. H. B. K. Nov. Gen. et Sp. tom. 4. p. 108).

554. Brickellia *diffusa*, Asa Gray in Plantæ Wrightianæ, tom. 1. p. 86. no. 32.—*Eupatorium diffusum*, Vahl, De Cand. Prodr. tom. 5. p. 174. no. 216.—*Bulbostylis diffusa*, De Cand. Prodr. tom. 7. p. 268. no. 13. In woods of Veraguas.

The leaves of this plant much resemble those of *Eupatorium paniculatum*, Schrad., but the plant is easily distinguished by the different habit, and by the striking characters of the genus. The achænia are not glabrous, as stated by De Candolle, l. c. in Prodr. tom. 7, but covered all over with appressed greyish hairs, even in Berlandier's original specimen, no. 2144.

555. Critonia *Pseudo-Dalea*, De Cand. Prodr. tom. 5. p. 140. no. 2.—*Eupatorium Dalea*, H. B. K. Nov. Gen. et Sp. tom. 4. p. 106. no. 3 (non Linn. non Swartz nec Jacqu.). Volcano of Chiriqui, Veraguas.

A much stouter plant than *Critonia Dalea* of De Cand., with leaves of greater size and a firm coriaceous texture, whose panicle is more blunt and much more crowded. In Dr. Seemann's specimen the leaves are 5–7 inches long, $1\frac{1}{2}$–$1\frac{3}{4}$ inch broad, and the capitula always five-flowered.

556. Eupatorium (Cylindrocephala) *conyzoides*, Vahl, De Cand. Prodr. tom. 5. p. 143. no. 14.

Var. *glabrescens*, Steetz; foliis late ovatis subtriangularibus, basi cuneata et apice valde acuminato integerrimis, medio parce obtuseque dentatis utrinque glabriusculis, capitulis augustis, 11–14-floris. Savanas about Panama.

Our variety has a very peculiar habit; but having compared many specimens from different localities, I am convinced that it is a mere variety of *E. conyzoides*, Vahl, a most variable species. Even in the same specimen the leaves are of a very different shape: many of them in our variety are almost acute triangular, $1\frac{1}{2}$–2 inches long and broad; others are rounded at the cuneate base, and not broader than an inch, with the length of 2 inches; but the base of all their forms is somewhat cuneiform, entire and suddenly attenuated in the petiole, their point very acuminate. They are almost glabrous on both sides, but dotted beneath with numerous little glands, and scarcely and obtusely toothed in their middle, or at all entire. I have seen specimens from British Guiana (Rich. Schomburgk), Cartagena (Billberg), Caracas (Moritz), Puerto Cabello (Karsten, Otto), Mexico (Ehrenberg), Papantla (Schiede), Cuba (Otto), etc. In most of them the leaves are narrower, from lanceolate to ovate, and are so gradually passing over in our variety, that I cannot find a strict difference; they are in general pubescent beneath, but also in a more or less degree, and with the serratures more numerous and more acutish. The number of flowers in the flower-heads vary from eleven to thirty in each, and the scales of the involucre are always obtuse, by which this species is well and easily distinguished from *Eupatorium odoratum*, Linn., the scales of which being acutish, and even acuminate, chiefly the innermost ones. *E. odoratum* moreover rarely occurs in Columbia (Karsten), but commonly in most of the West Indian Islands.

557. Eupatorium (Cylindrocephala) *lævigatum*, Lam. Encyclop. tom. 2. p. 408.—H. B. K. Nov.

Gen. et Sp. tom. 4. p. 117. no. 27 !—*Eupatorium trinerve,* Willd. ! Herbar. no. 15,152 (specim. Humboldt.!)—*Eupatorium psiadiæfolium, β latifolium,* Miquel ! Stirp. Surin. select. p. 183. no. 1. tab. 54 (an etiam De Cand.?) Savanas about Panama.

I have not met with this interesting plant in De Candolle's Prodromus, and I should almost think it has been omitted there, unless it is his *E. psiadiæfolium, β latifolium,* as stated by Miquel, l. c. It is so closely allied to *Eupatorium resinosum,* Pœpp. et Endl. in Nov. Gen. et Sp. tom. 3. p. 54. no. 2 (of which I have seen original specimens), that at first sight it seemed to me that this Peruvian plant was a mere variety of *E. lævigatum,* with somewhat smaller flower-heads; but in examining the achænia, I found the bristles of the pappus more slender, and not so manifestly united at the base, as is the case in our plant, which is quite the same as the original specimens gathered by Humboldt, and compared by me, in Willdenow's and Kunth's Herbaria.

558. Eupatorium (Cylindrocephala) *ivæfolium,* Linn., De Cand. Prodr. tom. 5. p. 146. no. 32. Panama.

559. Eupatorium (Subimbricata) *iresinoides,* H. B. K. Nov. Gen. et Sp. tom. 4. p. 106. no. 2. tab. 340 !

Var. *a. villosum,* Steetz; caule foliisque subtus dense villosis, supra pubescentibus.—*E. iresinoides,* H. B. K. ! l. c.—De Cand., Prodr. tom. 5. p. 153. no. 76.—*E. celosioides,* Willd. ! Herbar. no. 15,151 ! (specim. Humboldt.!) Panama.

Var. *β. glabrescens,* Steetz; caule foliisque utrinque plus minusve pubescentibus vel imo glabriusculis.—*Ageratum conyzoides,* Sieb. Herbar. Martinic. no. 191 ! (non Linn.)—*Mikania serratifolia,* Sieb. Herbar. Trinitatis, no. 72 ! (an etiam H. B. K.?)—*E. Sieberianum,* De Cand. ! Prodr. tom. 5. p. 181. no. 262 (an etiam no. 261?)—*E. exiguum,* Klotzsch ! MSS. in Herb. regio Berolinensi. Panama.

This species is most variable, not only in the degree of the pubescence, but also in the size and shape of the serratures of the leaves, which are so inconstant, that in both varieties the leaves are acutely serrate, or repandly and obtusely toothed, or at all entire, from the same locality, often on the same specimen. I have seen this plant from Ibague, New Granada, var α (Humboldt), Caracas, var. α (Moritz), Port Royal, var. α (in herbar. Lamarck.), Martinico, var. β (Sieber), Isle of Trinidad, var. β (Sieber), La Guayra, var. α et β (Moritz, Otto); Dr. Seemann also collected both varieties in Panama. So inconstant the leaves have been found, so constant is the species in its floral parts and in the whole habit. It is well distinguished by its cyme-like divaricate panicles, which bear in each bifurcation some short-stalked single flower-heads, by the slender five-flowered capitula, and by the yellow basilar callus of the ripe achænia, which is very large, somewhat oblique, and spongious. The slight imbricated involucre, and its very unequal scales, are not variable, neither in size nor in shape. I do not know whether the *Mikania serratifolia,* H. B. K. (*Eupatorium serratifolium,* De Cand. Prodr. tom. 5. p. 181. no. 261) belongs to our species, because I have not seen an original specimen of it, but I should think so. I found in Kunth's Herbarium the plant of Sieber (Herb. Trinit. no. 72) under the name "*Mikania serratifolia,* Kunth," written by his own hand.

559*. Eupatorium (Subimbricata) *critonioides,* Steetz, sp. nov.; fruticosum, ramis teretibus striatis glabris, junioribus parce pubescentibus, foliis oppositis petiolatis ovatis apice acutis basi attenuatis margine callose crenato-serratis membranaceis utrinque glabris pellucide punctatis penninerviis, capitulis breviter pedicellatis 10–12-floris in paniculam thyrsoideam confertissimam dispositis, involucri campanulati squamis 4–5-serialibus ovatis obtusiusculis leviter arachnoideis deciduis, achæniis glaberrimis. Volcano of Chiriqui, Veraguas.

Frutex sive arbuscula. *Rami* oppositi, teretes, striati, inferiores glaberrimi virides, superiores

parce pubescentes canescentes. *Folia* opposita, petiolata, *petiolo* 1–2-pollicari glabro basi latiore puberulo semiamplexicauli supra canaliculato, ovata, basi cuneato-attenuata integra, apice acuta vel subacuminata, margine leviter subæqualiter et callose crenato-serrata, membranacea, glandulis pellucidis luteis creberrimis punctata, penninervia, nervo medio et lateralibus validis, omnibus venisque subtus prominentibus reticulata; inferiora utrinque viridia glaberrima, vel subtus secus nervos vix ac ne vix quidem puberula, 5–8-pollicaria, 2–3 pollices lata; superiora supra puberula, subtus cum petiolo pubescentia canescentia, pollice vix majora, 6–8 lineas lata. *Panicula* thyrsoidea, pyramidata, terminalis, in specimine quod suppetit circiter 5-pollicaris, obtusiuscula, ramis ramulisque capituligeris oppositis pubescentibus, inferioribus ex axillis foliorum summorum ortis per pollicis spatium omnino nudis, cæteris a basi fere ramulosis et bractea basilari parva suffultis. *Capitula* densissime congesta numerosissima, breviter pedicellata, raro subsessilia, pedicellis inæqualibus pubescentibus,—10–12- plerumque 11-flora. *Involucrum* campanulatum, imbricatum, circiter 3 lineas altum, disco duplo fere brevius; *squamæ* 4–5-seriales, deciduæ, exteriores brevissimæ ovatæ ferrugineæ, intimæ oblongæ 2–2½-lineares nervosæ stramineæ summo apice ferrugineæ, omnes obtusiusculæ coriaceæ, plus minusve cymbæformes, pagina interiore glaberrimæ nitentes, exteriore vel totæ arachnoideæ vel margine lana intricata alba ciliatæ. *Receptaculum* augustum, planum, nudum, tuberculatum. *Flores* omnes tubulosi, graciles, albidi, glabri, fauce vix ampliata, apice breviter et obtuse 5-dentati. *Filamenta* paullo infra insertionem antherarum, more plurimarum Eupatoriacearum, deorsum atque iterum sursum plicata. *Antheræ* inclusæ, basi ecaudatæ, apice supra connectivum appendicula libera brevi continua ovata obtusa hyalina auctæ. *Stylus* glaber, basi incrassatus. *Stigmatis* rami valde elongati, exserti, divaricati, complanati, apice obtusi. *Achænia* matura pentagona nitida undique et ipsis angulis glaberrima, lineam et quadrantem longa, basi attenuata, nigra, callo basilari costisque stramineis; pappi uniserialis setis paullisper inæqualibus corollam subæquantibus creberrimis albidis patulis levissime serratis, ima basi interdum cohærentibus.

This species approaches nearest to the genus *Critonia*, P. Browne, chiefly by its leaves, which are dotted with pellucid glands, and by its deciduous involucral scales; but on account of the eleven-flowered capitula it must be referred to *Eupatorium*, a genus differing from *Critonia* by a few unimportant characters. On the other hand, our *E. critoniodes* is closely allied to *E. populifolium*, H. B. K. (Nov. Gen. et Sp. tom. 4. p. 111. no. 14; De Cand. Prodr. tom. 5. p. 155. no. 94), of which I have examined an original specimen in Kunth's Herbarium; but this plant has much broader leaves, 5–6 inches at the rounded base, which is cuneiform and softly attenuated in Dr. Seemann's plant; otherwise they are of the same texture, nervation, and serrature on the margin, and also dotted with yellow pellucid glands, a character which has not been mentioned by Kunth in his accurate description, l. c. Moreover *E. populifolium*, H. B. K., differs by its really sessile and densely clustered flower-heads, by the almost glabrous involucral scales, and by the achænia, which are covered towards the apex with scattered hairs.

560. Eupatorium (Subimbricata) *Schiedeanum*, Schrader, Ind. Sem. hort. Götting. 1832. p. 3.—De Cand. Prodr. tom. 5. p. 159. no. 118.

Var. δ. *tomentosum*, Steetz; foliis deltoideis basi integerrima cuneatis cæterum crenatis supra scabris subtus cum ramulis petiolisque dense rufo-tomentosis, capitulis breviter pedicellatis 25–30-floris, involucri squamis dorso pubescentibus. Volcano of Chiriqui, Veraguas.

Var. ϵ. *capitatum*, Steetz; foliis deltoideis basi integerrima cuneatis cæterum crenato-serratis supra parce subtus cum ramulis petiolisque dense cano-tomentosis, capitulis plerisque subsessilibus dense capitato-congestis 20–25-floris, involucri squamis dorso pubescentibus. Volcano of Chiriqui, Veraguas.

These varieties have a peculiar habit, and at first sight they seemed to me to be different from the typical form, of which I have seen an original specimen gathered by Berlandier in Mexico. But I have seen so many intermediate states, that I am unable to find any constant character, which could lead me to consider them as different species. A third variety, collected by Moritz in Merida (Venezuela), and by Ehrenberg in Mexico, has the same inflorescence as our variety *capitata*, but with the leaves almost glabrous or somewhat scabrous on both sides, and with the involucral scales very glabrous and bright green. In all varieties however I found no difference either in the size or in the shape of the capitula, involucral scales, flowers, and achænia. The number of flowers in each capitulum varies from twenty to thirty.

561. Eupatorium (Subimbricata) *loniceroides*, H. B. K. Nov. Gen. et Sp. tom. 4. p. 116. no. 25. —De Cand. Prodr. tom. 5. p. 166. no. 163. Savanas about Panama.

De Candolle had not seen this species, and therefore he erred in placing it into the third section *Eximbricata*. It belongs really to the second section, *Subimbricata*, having the scales of the campanulate involucre in about three or four series. *Eupatorium subobtusum*, De Cand. Prodr. tom. 5. p. 161. no. 133, seems to be not different from our plant, which is widely diffused over the Southern Continent of America.

562. Eupatorium (Subimbricata) *Barclayanum*, Benth., Bot. of Belch. Voyage of the Sulphur, p. 112.—Wlprs. Rep. Bot. Syst. tom. 6. p. 110. no. 11. Island of Taboga, Bay of Panama.

This species is allied to *Eupatorium dodonæfolium*, De Cand. Prodr. vol. 5. p. 161. no. 129, of which I have seen original specimens gathered by Pœppig, and does not differ except by the much shorter, more obtuse, and almost sessile leaves, of which the inferior ones are 1¾ inch long and 1⅓ inch broad; the achænia of *E. dodonæfolium* being likewise covered with short hairs, and not glabrous, as stated by De Candolle, l. c., and by Pœppig and Endlicher in Nov. Gen. et Sp. tom. 3. p. 55. no. 6. Having compared a great many specimens of *E. dodonæfolium*, *E. fraternum*, De Cand., and *E. loniceroides*, H. B. K., I found, on one hand, the shape and size of the leaves, which are sometimes quite entire, sometimes toothed with slight repand callous teeth, so variable, and, on the other hand, the whole habit and inflorescence so constant in all these species, that I should think, in future they might be considered as mere varieties of one most variable species.

563. Eupatorium (Subimbricata) *Vitalbæ*, De Cand. Prodr. tom. 5. p. 163. no. 148. *Campuloclinium Surinamense*, Miquel! Stirp. Surinam. select. p. 182. tab. 53. Savanas about Panama.

I have not seen an original specimen of this rare species, but Dr. Seemann's specimens agree so well with the short diagnosis of De Candolle, which exhibits so strictly the chief characters of this interesting and well-marked plant, with a somewhat divergent habit, that without any doubt they are not different from the Brazilian species detected by Lund. I found the not quite mature achænia glabrous, as described by De Candolle, but furnished on the angles with a few scattered hairs; but they are certainly pentagonal, and not quadrangular, as stated by Miquel, l. c., whose description and figure otherwise agree; the yellow basilar callus of them are very large, and somewhat spongious, and the receptacle is nicely alveolate. This beautiful species, however, nearliest approaches the *Bulbostylis Cassiniana* of Gardner (cf. Hook. Lond. Journ. of Bot. tom. 5. p. 471), which is a true *Eupatorium*, as remarks Dr. Asa Gray in 'Plantæ Wrightianæ,' tom. 1. p. 86, and as I have seen by examining an authentic specimen in the Imperial Herbarium at Vienna; but it is well distinguished by a more fruticose habit, by the quintuplinerved leaves, which are glabrous and smooth on both sides, and which are rounded at the base, and not gradually attenuated into the cuneately winged petiole, by the fewer and broader scales of the involucre, by the greater number of flowers (forty-five to fifty) in the capitulum, and by the almost glabrous achænia, which are entirely glandulose-pilose in Gardner's plant.

564. Eupatorium (Eximbricata) *Aschenbornianum*, Schauer, in Linnæa, tom. 19 (1847). p. 720. no. 6.—Walprs. Ann. Bot. Syst. tom. 1. p. 402. no. 27. Volcano of Chiriqui, Veraguas.

This species, with which an original specimen gathered by Aschenborn in Mexico, defined by Schauer, fully agrees, is closely related to *Eupatorium Pichinchense*, H. B. K. (Nov. Gen. et Sp. tom. 4. p. 122. no. 37), but well distinguished by a somewhat different habit, by a denser pubescence, chiefly on the under surface of the leaves, by smaller and more rounded crenatures, which are larger and mucronate, by a callous tip in the *Eup. Pichinchense*, and by the scales of the involucre, which are more obtuse and blunt at the summit, and not acute as in Humboldt's plant. The specimens gathered on the Chiriqui Volcano have somewhat smaller leaves, and a more downy and brownish pubescence; otherwise I do not find any difference. The bristles of the pappus seem to be very deciduous in this species.

565. Eupatorium (Eximbricata) *stenolepis*, Steetz; suffruticosum, totum pilis glandulosis hirtum, asperulum, ramis teretibus, foliis oppositis decussatis penninerviis lanceolatis subintegerrimis sessilibus apice acutis basi valde attenuatis, paniculæ coarctatæ ramis decussatis basi nudis, capitulis breviter pedicellatis vel subsessilibus dense congestis 25–30-floris, involucri campanulati squamis patulis angustis 2–3-serialibus acutis interioribus acuminatis, achæniis nigris parce puberulis, pappi albissimi setis flore brevioribus sæpe deciduis. Santiago de Veraguas.

In specimine unico, quod suppetit, video caulem vel ramum pedalem, teretem, pube brevissima hirtum, crassitie pennæ corvinæ, in parte inferiore propter folia delapsa cicatricosum, internodiis brevissimis 3–4 lineas longis, in parte superiore pilis crassis glanduligeris rufis hirtum. *Folia* pauca, quæ supersunt, opposita, decussata, approximata, crassiuscula, penninervia, lanceolata, subintegerrima vel levissime repando-undulata, versus basin valde attenuata, petioliformia sed revera sessilia, sive si mavis in petiolum anguste alatum sensim abeuntia, utrinque pilis simplicibus et (præsertim margine) glanduligeris dense hirta, asperula, tripollicaria, 6–8 lineas lata, superiora sensim decrescentia, acuminata. *Paniculæ* coarctatæ ramuli oppositi, decussati, axillares, basi longiuscule nudi, supra medium corymbo composito confertissimo terminati. *Capitula* numerosa, breviter pedicellata vel subsessilia, basi bracteata, 25–30-flora, 3 lineas alta. *Involucri* campanulati discum subæquantis squamæ 2–3-seriales, angustæ, patulæ, dorso glandulosæ, extimæ brevissimæ, bracteæformes, acutæ, uninerves, mediæ, intimis duplo fere breviores, et intimæ anguste lineares, basi nervis 2 validis glabriusculis stramineis exaratæ, acuminatæ, acumine utrinque rufescente ciliato, cæterum pagina interiore glaberrimæ, stramineæ, nitentes. *Receptaculum* planum, nudum, tuberculatum. *Flores* omnes tubulosi, ut in sicco videtur lutei, tubo gracili, fauce sensim ampliata sublongiore, 2 lineas longi, apice 5-dentati, dentibus obtusiusculis, saturatius coloratis, extus glanduloso-puberulis. *Filamenta* infra insertionem antherarum stricta! *Antheræ* inclusæ, basi rotundatæ, apice supra connectivum in appendiculam liberam brevem continuam ovatam obtusiusculam enervem hyalinam productæ. *Stylus* glaber basi incrassatus. *Stigmatis* rami elongati, exserti, divaricati, versus apicem undique papillis pro genere longiusculis manifeste hispidi! *Achænia* matura pentagona, nigra, parcissime puberula, callo basilari stramineo munita, semilineam longa. *Pappi* albissimi, setæ inæquales, haud numerosæ, tenuissimæ, leviter serratæ, corolla breviores, fragiles, itaque sæpe deciduæ.

566. Eupatorium (Eximbricata) *elatum*, Steetz; herbaceum, totum parce puberulum, caule elato tereti striato, ramis axillaribus divergentibus, foliis herbaceis penninerviis lanceolatis integerrimis acuminatis, inferioribus oppositis sessilibus maximis, superioribus multo minoribus sæpe alternis et in petiolum brevem angustatis, panicula composita bracteata laxa, ramulis basi nudis apice capitula 2–4 inæqualiter pedicellata 20–25-flora gerentibus, involucri campanulati squamis 2–3-serialibus obtusis, achæniis glabris ad angulos parce hirsutis. Forests of Panama.

Caulis elatus, herbaceus, teres, parce puberulus, subtiliter multistriatus, inferne crassitie pennæ

anserinæ, medulla alba porosa totus fere farctus. *Rami* axillares, subangulati, inferiores oppositi, superiores sæpe alterni, undique angulo fere recto divergentes. *Folia* textura valde tenui, herbacea, penninervia, utrinque parce puberula, integerrima, lanceolata, apice acuminata; inferiora opposita, basi in petiolum anguste alatum contracta, vel potius revera sessilia, semiamplexicaulia, 9–10-pollicaria et ultra, medio 1½–2 pollices lata; superiora sensim sensimque breviora et angustiora, sæpius alterna, et in petiolum brevem 2–3 lineas longum angustata; summa linearia, bracteæformia. *Panicula* ampla, composita, brachiata, laxa, ejusdem ramuli capituligeri undique divergentes, folio basilari et sæpius ramulo secundario basi bracteato, brevissimo, 2–3-cephalo, rarius paullo elongato polycephalo, sed ramulo primario semper multoties breviore, suffulti, basi nudi, supra medium laxe ramosi. *Capitula* in apice omnium ramificationum ultimarum bina terna vel quaterna breviter et inæqualiter pedicellata, rarius solitaria, basi bracteata, 20–25-flora, 2½ lineas alta. *Involucri* campanulati discum subæquantis squamæ sub anthesi undique patentes, laxæ, 2–3-seriales; extimæ ovatæ, brevissimæ, bracteæformes, virides, obtusiusculæ, dorso plerumque binerves, pubescentes; intermediæ duplo longiores latioresque, lanceolatæ, obtusæ, basi medio-tenus nervis 2–4 exaratæ, glabræ, pallidiores, summo apice virides, pubescentes; intimæ intermediis triplo longiores sed multo angustiores, lineares, æquilatæ, pallidæ, plerumque binerves, apice colorato obtusissimo pubescentes, cæterum glabræ; omnes pagina interiore stramineæ glaberrimæ, nitentes. *Receptaculum* demum convexiusculum, nudum, scrobiculatum. *Flores* tubulosi, graciles, fauce vix ampliata, glabri, apice brevissime 5-dentato parce puberuli, linea vix longiores. *Filamenta* infra antherarum insertionem inflexa sed non biplicata, crassiora ac in congeneribus! *Antheræ* inclusæ, basi rotundatæ, apice supra connectivum validum in appendiculam liberam brevem oblongam subobtusam continuam enervem hyalinam productæ. *Stylus* glaber, basi incrassatus. *Stigmatis* rami exserti, sed (more Eupatoriacearum plerumque insueto) minus elongati, divergentes, supra bifurcationem applanati, papillis parvis hispidiusculi, et in apicem tortum acutiusculum sensim attenuati! *Achænia* matura pentagona, nigra, glabra, secus angulos setulis remotis asperula, callo basilari stramineo aucta, semilineam longa. *Pappi* albissimi setæ subæquales, tenuissimæ, leviter serratæ, corollam fere æquantes.

567. Eupatorium (Eximbricata) *Sinclairi,* Bentham? in Örsted Compositæ Centro-Americanæ, p. 15. no. 57 (1853). Forest between Panama and Cruces.

I am not quite certain whether Dr. Seemann's plant is the same as Örsted's, not having seen an authentic specimen. However, it quite agrees with the short and somewhat incomplete diagnosis given by Bentham, l. c.; but the flower-heads are said to be larger than in *E. capillipes*, Benth. l. c. no. 58, which has the capitula scarcely 1½ line long; in our species indeed they are not of a greater size. Besides this difference I am not doubtful about its identity. The leaves of our plant are 5–6 lines long and broad, most of them opposite, the uppermost much smaller, alternate, the branches being likewise opposite, forming a lax panicle.

568. Eupatorium (Eximbricata) *capillipes,* Benth. in Örst. Comp. Centro-Amer. p. 15. no. 58 (1853). Volcano of Chiriqui, Veraguas.

This little plant is somewhat dubious. It agrees partly with Bentham's brief diagnosis, but the capitula are not forty- to fifty-flowered, as stated by that botanist, they contain no more than twenty-eight to thirty flowers. The lower leaves of our specimen are fallen off; the upper are somewhat rhombic-lanceolate or oblong, 6–10 lines long, 2–3 lines broad, the lowest opposite, the upper mostly alternate, crenate-serrate, and somewhat scabrous; the long, capillaceous, monocephalous peduncles form a very lax panicle, not so branching as in the preceding species, which however nearly approaches it; the flower-heads,

the purple or rose-coloured flowers, and the achænia being quite the same, except that I find no more than twenty to twenty-three flowers in the foregoing species. Dr. Seemann's specimens are almost in a fading state.

569. Mikania (Spicæformes) *leiostachya*, Benth. Plantæ Hartweg. p. 201. no. 1110. Forests of Panama.

Dr. Seemann's plant belongs, without any doubt, to this species, although I have not seen the authentic specimen gathered by Hartweg. Bentham's short diagnosis entirely agrees with our specimens, except that they are here and there conspersed with a few slight hairs (which however are not visible except with the assistance of a lens) in the uppermost ramifications of the panicle, and in the nerves of the under surface of the leaves; otherwise our plant is glabrous. Walpers has omitted this species in his 'Repertorium Botanices Systematicæ.'

570. Mikania (Ecordatæ) *Guaco*, Humb. et Bonpland. Plant. Équinox. tom. 2. p. 84. tab. 105 (optime!).—H. B. K. Nov. Gen. et Sp. tom. 4. p. 136. no. 7.—De Cand. Prodr. tom. 5. p. 193. no. 47.—*Mikania scabra*, Willd.! Herbar. no. 15,091 (non De Cand.), specimen Humboldtianum!—Nomina vernacul. "Guaco" et "Yerba de Guaco." In forests all over the Isthmus.

"Among the numerous plants used by the inhabitants of America to counteract the effect of the bites of venomous snakes, those called Guacos or Huacos occupy a prominent place. Some extraordinary stories are related of them, but it remains yet to be ascertained how far they can be depended upon, and travellers will have yet to identify the vernacular names of these plants with their respective scientific appellations. Dr. M. Colazio, a friend of mine, found the Indians of Central America very dexterous in catching the most dangerous snakes; they were never bitten by them,—on the contrary, the reptiles seemed to fly their presence, and if taken wound in their hands as if touched by a hot iron. On asking for an explanation of so remarkable a phenomenon, the natives informed him that they had 'guaconized' themselves, *i. e.* taken Guaco, which, if true, would prove the plant to be not only an antidote but also a prophylactic. Great misconception appears to prevail, and much has been written about the plant which ought to be considered the true Guaco. But the fact is that nearly every country has its peculiar Guaco. At first the name was probably confined to only one species; when however in newly discovered regions the original plant was not found, the appellation was transferred to another that happened either to resemble it in appearance or possess similar properties. The derivation of the word 'Guaco' could doubtless throw some light upon the subject; unfortunately it is unknown: some spell it Guaco, others Huaco; and in Peru, Ecuador, and the Isthmus of Panama, the same name is applied to the ancient Indian tombs; but whether there is any connection between the name of the plant and that of the native burial-places, I have no means of determining. Nor do I know to which of the American languages the word belongs. It sounds most like a corruption of a Quichua one, and if this should prove to be the case, those who spell it 'Huaco' would be the most correct. The Guaco plants are referred by most authors to an *Aristolochia*, a *Mikania*, and some unknown *Convolvulacea*. In the interior of Ecuador the inhabitants showed me pieces of wood bearing the name of Guaco, and said to have come from the coast; they were extremely bitter, but their structure and size differed entirely from any of those to which I have alluded. The Guaco of New Granada is the *Mikania Guaco*, H. et B., the variegated leaves of which render it a conspicuous object in a forest, and make it a matter of surprise that it is not more frequently met with in our gardens, now that plants with a similar foliage are so much in fashion. In Mexico several plants are called Guaco or Huaco, and Dr. Pablo de la Llave seems to have been eagerly collecting materials for a general article on them. Among his posthumous papers is one on this subject, which apparently is unfinished, and would have been much better left unpublished; but as it has already appeared in a Mexican periodical, I shall make the following extracts from it:—'I have received from Cordoba,' says the Mexican naturalist, 'four plants, all of which are species of *Mikania* (*M. coriacea*, *M. repanda*, *M. angulata*, and *M. Tlaxicoyan*),

and, though specifically distinct, bear the name of Huaco; and moreover I possess six creepers from other parts to which the same appellation is given. One of the latter is an *Aristolochia*, and I want to direct particular attention to the circumstances that it is a very distant part of South America whence it came, and where it is known by the name of Huaco, and as a plant counteracting the venom of snakes, and that here in Mexico the same appellation is given to creepers which possess the same properties,—a remarkable coincidence, from which it would appear that a far more active exchange of ideas has been carried on between the untutored many than among the learned few.' *Mikania Guaco* has lately been administered as a remedy for cholera-morbus. Don Andreas Diaz, a physician at Havana, is said to have first detected it as such. He appears to have given it in the form of an ethereal tincture, a mode of administration by no means satisfactory, as the ether itself may have exercised an important influence on the complaint. In Guatemala also this plant is used as a remedy for the cholera, but there the fresh leaves are only infused in rum or brandy. A French physician published, in 1853, a pamphlet on this subject, under the title, 'Du Huaco et de ses vertus médicinales: Réflexions médicales sur le Choléra-Morbus et son traitement avec la Mikania Huaco;' par Jean-Louis Chabert (Paris, 1853). In the beginning of 1854, an announcement that Guaco had been employed with success in some cases of deafness, induced inquiry for that drug in London, but the uncertainty attached to the vernacular name rendering it problematical which species of Guaco had been used, suggested the propriety of dismissing, in the science of medicine, this popular appellation, and adopting, in prescribing the drug, some definite scientific nomenclature."—*B. Seemann.*

571. Mikania (Cordiformes) *Orinocensis,* H. B. K., Nov. Gen. et Sp. tom. 4. p. 134. no. 2.—De Cand. Prodr. tom. 5. p. 196. no. 65.—*Mikania convolvulacea,* Willd.! Herbar. no. 15,087 (non De Cand.).—*Mikania tamnoides,* Willd.! Herbar. no. 15,093.—Utrumque specimen a Cel. Humboldtio ipso lectum! Savanas about Panama; flowers odorous.

Tribus III. Asteroideæ.

572. Conyza *lyrata,* H. B. K., Nov. Gen. et Sp. tom. 4. p. 70. no. 3.—De Cand. Prodr. tom. 5. p. 380. no. 19. Panama, in waste places.

573. Conyza *floribunda,* H. B. K., Nov. Gen. et Sp. tom. 4. p. 73. no. 12.—De Cand. Prodr. tom. 5. p. 380. no. 23.

Var. β; caule hispidulo superne paniculato, foliis subintegerrimis.—De Cand. Prodr., l. c.—H. B. K., l. c. p. 74. In waste places about Panama.

I have compared specimens from both localities, noted by Humboldt, in Kunth's Herbarium; the specimens from Quito, with a true corymbose inflorescence, are of a different habit from those with an ample pyramidate panicle, gathered at Guancabamba in Peru, but there is no other difference between them, and the flowers, the involucre, the receptacle, the achænia, etc., are in every respect quite the same in both; on the other hand, the leaves of the specimens from Quito are generally also entire, or but slightly and very remotely serrate. Otherwise Kunth erred in stating the flower-heads being thirty- to thirty-five-flowered; they contain really double that number or even more. I observed in Dr. Seemann's specimens, as well as in Kunth's, from both localities, sixty to seventy in each, the number of staminate flowers varying from four to eight, or even more. The leaves of Dr. Seemann's plant are of a more greyish hue, being covered with a somewhat denser pubescence of short canescent appressed hairs. This species seems to be diffused over a great portion of South America; I have seen specimens of the var. β, from St. Thomas (Ehrenberg) and Rio Janeiro (Gaudichaud). The allied *Conyza albida,* Willd., is well distinguished by a more strigose pubescence, with most divergent and longer hairs, and much smaller flower-heads.

574. Baccharis (Trinervatæ) *rhexioides,* H. B. K., Nov. Gen. et Sp. tom. 4. p. 66. no. 49.—De Cand. Prodr. tom. 5. p. 399. no. 5. Panama, in savanas.

Dr. Seemann gathered both the male and female plant. The leaves of the male are somewhat larger, and at the summit acute, but not acuminate in such a slender point as in the female plant. Otherwise I found no difference besides the sex of the florets; the involucre is quite the same in both. The two original specimens in Willdenow's Herbarium, no. 15,571 (both sexes), and in Kunth's (the female plant only), gathered near Montan in the Peruvian Andes, are of a somewhat different habit from those of Dr. Seemann, which quite agree with others gathered by Moritz at Caracas, by Otto at La Guayra, by Ehrenberg in Mexico, etc., and which are considered by learned botanists as the true *Baccharis rhexioides*, H. B. K. Humboldt's plant is a stouter one, with thicker and shorter branches and peduncles, and a much more remarkable, denser, and tomentose pubescence; the leaves, in general not differing either in size or in shape (being somewhat variable in this respect), have a more light-green hue, with a silvery gloss; the inflorescence is a more crowded one, with the flowering branches more leafy; in the flower-heads however, the involucral scales, florets and achænia of the male, as well as of the female plant, I observed no essential difference. I do not decide whether our plant is a distinct species, or is a mere variety of *Baccharis rhexioides*, H. B. K., recommending this question to further examination.

575. Pluchea *odorata,* Cassini, Dict. 42. p. 3.—De Cand. Prodr. tom. 5. p. 452. no. 17.—*Conyza odorata,* Linn.—*Conyza Carolinensis,* Willd.! Herbar. no. 15,625. Panama, in waste places.

The leaves, in general being quite entire, are often found slightly or repandly toothed in the same specimen.

576. Eclipta *erecta,* Linn., De Cand. Prodr. tom. 5. p. 490. no. 1. Panama, in swamps.

577. Salmea *scandens,* De Cand. Prodr. tom. 5. p. 493. no. 2.—*Bidens scandens,* Linn. In savanas about Panama.

Varies with the leaves quite entire or repandly toothed, the teeth having callous tips. Dr. Seemann's plant is quite glabrous, and even the uppermost pedicels are very smooth; but the involucral scales and the chaff of the receptacle are somewhat puberulous. The nearly related *Salmea Eupatoria*, De Cand., however, not only differs from our plant by its dense pubescent branchlets and pedicels, but also by the longer flower-heads being more attenuate at the base, and not so blunt as in *Salmea scandens*, De Cand., and by the corollas and the awns of the achænia having twice the length of those in our species.

Tribus IV. Senecionideæ.

578. Milleria *quinqueflora,* Linn., De Cand. Prodr. tom. 5. p. 503. no. 1. Southern Darien.

579. Clibadium *leiocarpum,* Steetz; ramis teretibus molliter villosis, foliis petiolatis triplinerviis ovato-lanceolatis acuminatis basi attenuatis remote serratis supra scabris subtus pilis adpressis pubescentibus pallidioribus, corymbis trichotomis fastigiatis, involucri squamis glabris margine apiceque ciliatis, achæniis fertilibus glabris, sterilibus apice dense villosis. Volcano of Chiriqui, Veraguas.

Caules ramique oppositi, graciles, teretes, striati, villosi. *Folia* opposita, petiolata, petiolo villoso 2–5-lineari, triplinervia, ovato-lanceolata, basi longiuscule attenuata, margine leviter remote et callose serrata, raro subintegerrima, supra scabra et pilis raris adpressis conspersa, subtus pube adpressa dense tomentosa, pallidiora, 3–4-pollicaria, 10–16 lineas lata, superiora minora. *Corymbi*

trichotomi, fastigiati, terminales, ramis ramulisque basi bracteatis, gracilibus, teretibus, dense et patenter villosis. *Capitula* monoica, breviter pedicellata, rarius subsessilia, pedicello basi bracteola minima lineari pubescente suffulto, ramulos ultimos corymbi terminantia, subglobosa, parva, 1½ lineam alta et lata. *Involucri* biserialis squamæ herbaceæ apice conniventes, sub anthesi floribus masculis breviores, nervosæ, apice margineque longe ciliatæ, cæterum glabræ, plerumque 6–8, inæquales, imbricatim semi-amplectentes, exteriores 3 et interiores 2 late ovatæ acutiusculæ, cochleariformes, quibus sæpe 1–3 multo angustiores planiusculæ intimæ accedunt. *Receptaculum* perangustum, nudum. *Flores* omnes tubulosi; *fœminei* 4 vel 5 in ambitu, involucri squamis absconditi, compressiusculi, subarcuati, apice 3-dentati, albidi, tubo lineam longo ovario ovato compresso glabro nigro calvo insidente; *styli* rami exserti, divergenti-recurvi, adplanati, extus parce papillosi, intus versus bifurcationem glabri, in apicem obtusiusculum attenuati. *Flores* masculi 7–12 centrales, cylindrici, tubo brevissimo basi parum attenuato, fauce sensim ampliata æquali, apice brevissime 5-dentati, dentibus ovatis, inflexis, villis papillosis longiusculis densissime obsitis, cæterum glaberrimi, nervis 5 in sinus dentium excurrentibus perducti, olivacei, cum ovario lineari, tereti, basi glabro, supra medium pilis longissimis articulatis crispis densissime villoso, semilineam longo, lineas 2 metientes. *Filamenta* crassiuscula, plana, ima basi corollæ inserta, infra insertionem antherarum ante anthesin spiraliter torta, flavescentes; *antheræ* antheseos tempore sæpe exsertæ, basi ecaudatæ, apice in appendiculam liberam, ovatam, basi paullo constrictam, apice acutam, inflexam auctæ, nigræ; *pollinis granula* globosa, undique echinulata, alba; *stylus* indivisus, exsertus, cylindricus, obtusus, dense papillosus. *Achænia* florum fœmineorum fertilia, crassa, obovata, subcompressa, basi in stipitem brevissimum sæpe hinc album attenuata, apice tuberculo minimo integro obtuso, vel interdum bifido, aucta, cæterum calva, aterrima, nitentia, glaberrima, lineam longa, et medio fere æquilata. *Achænia* florum masculorum sterilia, stipitiformia, basi medio tenus glabra, vel pilis raris conspersa, supra medium et apice obtuso pilis albis planiusculis longissimis articulatis crispis densissime villosa, lineam paullo superantia.

This species is well distinguished from all others which are known and described, by the smooth and shining, dark black-coloured achænia of the ray, and by the glabrous involucre being only ciliate on the margin of the scales and at their summit. It seems however to be related to *Baillieria Barbasco*, H. B. K., Nov. Gen. et Sp. tom. 4. p. 288, and Kunth's accurate description of it agrees with it almost entirely, but the receptaculum is certainly not chaffy in our plant. I have not seen a specimen of Humboldt's collection, which is, I believe, wanting in Willdenow's and Kunth's Herbaria, and thus it will remain a doubtful species.

Unxia, Linn. fil., supplem.—De Cand. Prodr. tom. 5. p. 507.—Miquel, Stirp. Surinam. Select. p. 191. tab. 56 (non H. B. K.).—Char. Gen. emend. *Capitulum* monoicum pluriflorum, floribus marginalibus fœmineis 2–5 vel pluribus tubulosis vel ligulatis, floribus centralibus 3–7 vel pluribus masculis tubulosis, omnibus guttis resinosis conspersis. *Involucrum* biseriale, exterius diphyllum, e squamis 2 lanceolatis oppositis bracteæformibus constans, interius e squamis 4–5 obovatis compositum, quarum 2 oppositæ longitudinaliter plicatæ, reliquæ planæ. *Receptaculum* demum convexum, epaleaceum*, gyroso-alveolatum. *Corollæ* florum fœmineorum sive tubulosæ, inæqualiter

* Cl. Miquel, l. c., receptaculum paleaceum, et quidem flores fœmineos paleis longioribus, masculos paleis depauperatis persistentibus discriminatos descripsit, et in icone tab. 56. fig. *b* et *c*, delineavit. Equidem, iterato examine, receptaculum utriusque speciei semper omnino nudum observavi, tum in capitulis florigeris, tum in fructiferis. Cæterum specimen meum *Unxiæ camphoratæ*, Linn. fil., in descriptionem et iconem a Cl. Miquel, l. c., exaratam bene quadrat, exceptis antheris, quarum veram imaginem figura *c* non reddit.

dentatæ, sive ligulatæ, ligula brevi ovata, apice plerumque bifida; *stylus* apice bifidus, ramis brevibus obtusis divergentibus revolutis. *Corollæ* florum masculorum tubulosæ, tubo gracili, fauce valde ampliata, profunde 4- vel 5-dentata, nervis 4 vel 5 in sinus dentium excurrentibus perductæ; *antheræ* exsertæ, basi ecaudatæ, connectivo apice in appendicem liberam ovatam acutam producto; *pollen* sphæricum echinulatum; *stylus* indivisus, apice paullisper incrassatus subtruncatus. *Achænia* florum fœmineorum fertilia dura crassa obovata subcompressa, apice tuberculo bifido coronata, cæterum calva, prope basin areola laterali excavata. *Achænia* florum masculorum linearia, sterilia.—Herbæ *di- vel trichotomæ, undique pilis longis patentibus planis albis articulatis e basi lata sensim angustatis hirsutæ;* foliis *oppositis, subsessilibus, lanceolatis, subintegerrimis, obscure* 3- *vel* 5-*nerviis;* capitulis *axillaribus et terminalibus, solitariis vel geminis, brevissime pedicellatis subsessilibusve, parvis; in America æquinoctiali indigenæ.*

580. Unxia *digyna*, Steetz (Tab. XXX.); capitulis subsessilibus, involucri interioris squamis 4, floribus fœmineis 2 tubulosis inæqualiter 3-dentatis, masculis 3–5 profunde 5-dentatis. About Panama.

Radix annua, e fibris numerosis ramosis flexuosis gracilibus constans. *Caulis* 1–2-pedalis et ultra, teres, pilis longis patentibus articulatis albis dense hirsutus, infra medium trichotomus, supra dichotomus. *Pili* ejus et totius plantæ basi lata plani, sensim in acumen tenuissimum attenuati, singulari modo articulati sunt; *articuli* scilicet (oculo optime armato observati) longiusculi, inæquales, alii quadrangulares, utrinque truncati, tæniæformes, cum aliis multoties angustioribus teretibus hinc inde alternant. *Folia* opposita, omnino fere sessilia et integerrima, vel remote et obsolete serrulata, utrinque hirsuta; inferiora 1–1½-pollicaria, basi semipollicem lata; superiora sensim decrescentia, semipollicaria vel minora, basi 3–1 lineam lata. *Capitula* minuta, 1½ lineam circiter longa et lata, ovata, subsessilia, axillaria et terminalia, solitaria vel gemina. *Involucri* conniventis squamæ exteriores duæ oppositæ, lanceolatæ, bracteæformes, herbaceæ, extus hirsutæ et ciliatæ, intus glabræ; squamæ involucrales interiores 4, binæ laterales oppositæ, carinatæ, longitudinaliter plicatæ, ovatæ, herbaceæ, dorso hirsutæ, nervosæ, achænia fertilia includentes, reliquæ binæ ante anthesin a squamis lateralibus carinatis utrinque tectæ, subscariosæ, planæ, late obovatæ, nervis 7–9 longitudinalibus perductæ, glaberrimæ, margine vix ac ne vix quidem breviter ciliatæ. *Achænia* fertilia glabra, nigra, lineam fere longa et lata. *Receptaculum, flores* et omnia reliqua supra in charactere tum generico tum specifico descripta et in icone delineata sunt.

This species approaches *U. camphorata*, Linn. fil.,—of which I possess a specimen gathered by Richard Schomburgk, in British Guiana,—in the habit as well as in shape, size, and pubescence of the leaves, even in the long articulated hairs. But *U. camphorata*, Linn., is well distinguished by the somewhat greater and conspicuously pedicelled capitula, by the inner involucre, consisting of five scales, of which the two lateral are plicate and opposite, the three others flat. Otherwise it differs particularly by the greater number of florets, each capitulum containing five ligulate female ones and five to seven male. The obovate ligulæ however, which are bifid at the summit, scarcely exceed the length of half a line. *U. hirsuta*, Rich., is unknown to me.

Plate XXX. Fig. 1, capitulum; 2, 3, 4, scales of the involucrum; 5, female flower; 6, stigma; 7, ovary; 8, male flower; 9, male flower cut open; 10, anther.

581. Baltimora *Scolospermum*, Steetz.—*Scolospermum Baltimoroides*, Lessing, Linnæa, tom. 5 (1830). p. 152. tab. 2. fig. 19–21, 23–31.—*S. Fougerouxiæ*, De Cand. Prodr. tom. 5. p. 509.

Var. *Panamensis*, Steetz; paleis receptaculi acuminatis minus ciliatis, achæniis radii triquetris, apicibus angulorum in appendicem alatam obtuse ovatam unicam productis. Panama, in savanas.

Dr. Seemann's plant is intermediate between *Scolospermum Baltimoroides*, Lessing, and *Baltimora recta*, Linn., and at first sight all three seem to belong to one species, so much alike is the habit of all. In the common *B. recta* the chaff of the receptacle is blunt, or somewhat acute, but never acuminate; the immature achænia, as well of the ray as of the disc florets, having constantly a little toothed deciduous pappus, which is only crown-like, without any teeth in our species and its variety, and the ripe achænia are triquetrous, but not at all extended into one ovate-winged appendage at the summit of each angle, as in our variety. In *Scolospermum Baltimoroides*, Lessing, there are two wing-like appendages at the summit of each angle in general, but even in the authentic specimen gathered by Schiede I observed one of them sometimes wanting, so that Dr. Seemann's plant can only be considered as a mere variety of it, with less ciliate chaff of the receptacle. Otherwise I detected no difference, except that Dr. Seemann's plant is a more luxuriant one, with the leaves and petioles of greater size (3 inches long, 1½ inch broad), but of the same shape and the same scabrous pubescence. On the other hand it is evident that three plants of such a resemblance in habit, cannot be dispersed into two different genera, chiefly since our variety *Panamensis* unites them in so natural and remarkable a manner. Therefore I reduce Lessing's *Scolospermum* to the old Linnean *Baltimora*, so much the more, as in both genera, and not in *Scolospermum* alone, the achænia of the ray-florets are enveloped into a foliaceous integument, with which the wing-like appendages are concreted, and not with the developed achænia, which are quite the same in both. Otherwise it would be necessary to disjoin the allied genus *Melampodium* in almost as many genera as there are known species.

582. Melampodium *paludosum*, H. B. K., Nov. Gen. et Sp. tom. 4. p. 273. no. 3. Panama, on road-sides.

Our plant agrees well with an authentic specimen in the Royal Herbarium at Berlin, and with other original specimens gathered by Schiede in Mexico, and defined by Lessing; but in the fertile achænia the transversal line in the lateral surface is entirely wanting or obsolete; the younger ones being smoother than the ripe achænia, which are "subverrucoso-exasperata." Lessing, and after him De Candolle in Prodr. tom. 5. p. 520, unite this species with *Melampodium divaricatum*, De Cand.; it seems to me however to be distinguished by its slender and simple habit. *Melampodium divaricatum* is a stouter plant, with a much thicker stem, branching often from the base, and with firmer leaves.

583. Acanthospermum *humile*, De Cand. Prodr. tom. 5. p. 522. no. 3.—*Melampodium humile*, Swartz, Prodr. Fl. Ind. Occ.—*Centrospermum humile*, Lessing in Synops. Panama, in waste places.

Varies with the leaves at the base cuneate and entire, or lyrato-dentate.

584. Wedelia *carnosa*, Rich., De Cand. Prodr. tom. 5. p. 538. no. 1.

Var. foliis late ovatis acutis inæqualiter et remote serratis, supra scabris subtus glabris. On the sea-shore of the Pacific Ocean.

The leaves of this species are most variable in size and shape. In our specimens they are broadly ovate, acute, cuneate and narrowed at the base, but truly sessile, serrate, with sharp, remote, and unequal teeth, of which the lowermost is the largest, showing thus a tendency to become trilobate. They are fleshy, 3–4 inches long, 1–1¾ inch broad, rough above, with few strigose, appressed hairs, and smooth and glabrous beneath; the peduncles and foliaceous oblong entire scales of the involucre are also beset with white appressed strigose hairs. Achænia not ripened.

585. Wedelia *Caracasana*, De Cand. Prodr. tom. 5. p. 541. no. 19. Chiriqui Volcano, Veraguas.

Dr. Seemann's specimens entirely agree with those gathered by Otto at La Guayra.

586. Wedelia *acuminata*, De Cand. Prodr. tom. 5. p. 541. no. 20. Panama, in savanas.

I have not seen authentic specimens from Cuba; but Dr. Seemann's single specimen agrees well with De Candolle's diagnosis. Most of the leaves are unequal at the base. It approaches however to *W. Caracasana*, De Cand., but seems distinguished by the longer and truly lanceolate scales of the exterior involucre, by the always solitary pedicels, and by a somewhat different habit. Ripe achænia I have not seen.

587. Wedelia *Acapulcensis*, H. B. K., Nov. Gen. et Sp. tom. 4. p. 215. no. 2.—De Cand. Prodr. tom. 5. p. 542. no. 26.—*W. calycina*, v. Schlechtendal! Linnæa (1831), tom. 6. p. 727. no. 181. (An etiam Richard in Pers. Synops. tom. 2. p. 490. no. 3?) In savanas about Panama.

I have seen authentic specimens of this plant gathered by Humboldt at Acapulco (Mexico) and by Ehrenberg in the Isle of St. Thomas, and published by v. Schlechtendal in the Linnæa, l. c., under the name of *Wedelia calycina*, Rich. These, as well as Dr. Seemann's specimens, belong to the same species. In the latter from the Isthmus however the leaves are somewhat more attenuated at the base, so that the petiole of the lower ones is not longer than a line, whilst the upper leaves are almost sessile. But the same difference occurs in Ehrenberg's specimens, who collected two varieties, one of which agrees with our plant, having the leaves 1 inch long and $\frac{1}{2}$ inch broad; in the other, with somewhat larger flower-heads, the leaves are of double the size, but with the same shape. Other differences I could not find.

588. Melananthera *hastata*, Richard in Michx. Flor. Bor. Amer. tom. 2. p. 106, 107*.—R. Brown.—*Melanthera hastata*, De Cand. Prodr. tom. 5. p. 545. no. 1.

Var. β. *pandurata*, Pursh. Panama.

589. Melananthera *microphylla*, Steetz; caule procumbente ramoso, foliis breviter pedicellatis oblongo-linearibus serratis acutis utrinque strigosis, capitulis in apice ramorum solitariis, paleis receptaculi acuminatis. On road-sides about Panama.

Radix perennis, lignescens, *caules* plures filiformes striatos subangulatos ramosos pilis strigosis adpressis paucis asperulos emittens. *Rami* oppositi, basi foliati, apice longiuscule nudi, capitulo solitario terminati. *Folia* breviter petiolata, petiolo vix lineam longo, opposita, coriacea, oblongo-linearia, apice acuta, basi breviter attenuata, margine argute serrata, utrinque strigis adpressis albis canescentia, asperula, supra nervis impressis, subtus prominentibus reticulata, pseudo-triplinervia, revera tamen penninervia,—nervis scilicet secundariis, angulo fere recto divergentibus, juxta marginem sursum tendentibus, cum illo parallelis et hujusmodi cum sequente sese jungentibus, nervos continuos longitudinales marginales utrinque simulantibus,—6–10 lineas longa, 1–2 lineas lata. *Pedunculi* ramos terminantes 1–2-pollicares, nudi et omnino ebracteati, monocephali, sub capitulo densius strigosi. *Capitula* homogama, floribus circiter 16–20 onusta, parva, florentia 3–3$\frac{1}{2}$ lineas alta et lata. *Involucri* biserialis campanulato-patentis disco duplo fere brevioris squamæ imbricatæ, rigidæ, inæquales, (exteriores plerumque multo angustiores et breviores,) ovatæ, acutæ, extus dense strigosæ, canescentes, intus apice strigoso excepto glaberrimæ, nervosæ. *Receptaculi* paleacei convexiusculi paleæ persistentes, rigidæ, subæquales, plicatæ et ante anthesin flores amplectentes, anthesi peracta basi carinatæ, versus apicem adplanatæ, obovato-cuneatæ et in acumen cuspidatum angustatæ, extus pube brevi hirtæ, intus plerumque glabræ, margine carinaque serrulato-

* Kunth informs us, in Humboldt's Nov. Gen. et Sp. tom. 4. p. 199, that the name "Melanthera" has not been proposed first by Rohr, but was only given by Richard in Rohr's Herbarium. Therefore the more orthographical denomination "Melananthera" of the same author, although published some years later, must be retained, so much the more as Rob. Brown, who emendated the generic character, adopted this name (cf. Transact. of the Linn. Soc. tom. xii. pt. 1. p. 117).

scabræ, 1½–2 lineas circiter longæ. *Flores* omnes hermaphroditi, tubulosi, nervis 5 inter dentium sinus excurrentibus percursi, pallide lutei, puberuli; tubulo brevi, quadrantem totius corollæ partem circiter metiente, sensim in faucem ampliatam, apice 5-dentatam transeunte, dentibus extus dense papillosis, intus glabris. *Filamenta* ima fauce inserta, planiuscula, alba, paullulum infra articulationem cum antheris torta, supra incrassata, et parte basilari dorsali antherarum adnata. *Antheræ* nigræ, sub anthesi sæpe longe exsertæ, basi ecaudatæ, apice supra connectivum in appendicem liberam subcordato-ovatam, basi utrinque rotundata constrictam, apice acutissimam, enervem, hyalinam productæ. *Pollinis granula* sphærica, undique echinulata. *Ovaria* obovata, compressa, basi paullisper attenuata, obtusa, glabra, setis rigidis 10–12 valde inæqualibus antrorsum serrulatis irregulariter dispositis caducissimis aucta. *Stylus* glaber; *stigmatis* rami exserti, utrinque recurvati, hispidi, acuti. *Achænia* matura subtetragona, crassa, compressiuscula, basi attenuata, obtusa, apice margine angustissimo calloso cincta, truncata, glabra, nigrescentia, disco epigyno puberulo, et seta una alterave residua aucta, cæterum calva.

This species is most remarkable, with a very different habit from all other congeners hitherto known; but its flower-heads resemble so completely the type of the genus, that I was indeed surprised when I found that it really belongs to *Melananthera*, Rich.

590. Gymnopsis *vulcanica*, Steetz; caule trichotomo, ramis divergentibus teretibus striatis asperulis, foliis petiolatis oppositis ovatis acuminatis argute serratis tri-quintuplinerviis supra strigosis subtus pubescentibus, capitulis in apice ramorum subternis, involucri biserialis squamis ovato-lanceolatis acuminatis strigosis, paleis receptaculi complicatis rigidis acuminatis, achæniis radii abortivis, disci compresso-tetragonis, margine angustissimo integerrimo coronatis cæterum calvis. Volcano of Chiriqui, Veraguas.

Specimen unicum, quod suppetit, est summitas sesquipedalis caulis floriferi. *Rami* oppositi, angulo recto fere divergentes, teretes, striati, vix asperuli, versus apicem hirti, cortice rubescente tecti, inæquales, (ramus dexter scilicet paris inferioris, sinister superioris 1–2-pollicaris, rami iis oppositi 6-pollicares et ultra; quod, si lege naturali necessario semper accidit, neque casu quodam solummodo in nostro specimine semel factum est, characterem significantem speciei addit). *Folia* petiolata, *petiolo* pubescente 4–8-lineari, opposita, basi attenuato-obtusa, apice acuminata, argute serrata, tri-quintuplinervia, nervis lateralibus inferioribus basi proximis, superiora interdum revera fere trinervia, supra strigoso-asperrima, subtus pallidiora, pubescente-scabriuscula, inferiora 2–2½-pollicaria, medio pollicem lata, superiora 1–1¼-pollicaria, semipollicem lata. *Capitula* ligulata, multiflora, in apice ramorum subterna, vel laxe corymbosa, pedunculata. *Pedunculi* pilis adpressis dense hirti, canescentes, monocephali, plerumque pollicaria. *Involucri* campanulati disco brevioris, squamæ 18–20, biseriales arcte imbricatæ, rigidæ, inæquales (exteriores plerumque breviores), ovato-lanceolatæ, acuminatæ, extus strigis albis adpressis dense hirtæ, canescentes, intus, præter apicem ciliatum, glaberrimæ, nervosæ, 2–3 lineas longæ, ½–1 lineam latæ. *Receptaculi* planiusculi paleæ complicatæ, carinatæ, lanceolatæ, acuminato-pungentes, dorso plus minusve pubescentes, nervosæ, intus glaberrimæ, margine (excepto summo apice) latiuscule scariosæ, 2–2½ lineas longæ, flores amplectentes, iisque triplo breviores. *Flores marginales* ligulati, uniseriales, circiter 10, inter paleas exteriores et involucri squamas interiores siti, palea non involuti. *Ligulæ* neutræ, sine ullo genitalium vestigio, utrinque parce hirsutæ, oblongæ, apice obtuse et brevissime bidentatæ, 7–9-nerviæ, pulchre aureæ, cum tubulo densius hirsuto, canescente, semilineari, 5–5½ lineas longæ, ovario sterili, lineam et quadrantem longo, parce puberulo calvo insidentes. *Flores disci* numerosi, hermaphroditi, tubulosi, cum ovario 3 lineas

longi; tubulo brevissimo vix semilineari, puberulo in faucem ampliatam sesquilineam longam, basi puberulam cæterum glabram, nervis 5 inter sinus dentium excurrentibus perductam, apice breviter 5-dentatam transeunte, dentibus obtusiusculis extus hispidis. *Filamenta* ima fauce inserta, latiuscula, vix torta; *antheræ* sub anthesi paullisper exsertæ, brunneæ, basi ecaudatæ, supra connectivum in appendicem liberam, ovatam, basi attenuatam, acutiusculam, hyalino-ferrugineam, uninervem productæ. *Pollinis granula* sphærica, undique echinulata. *Ovaria* oblonga, compressa, glabra, calva. *Stylus* basi in bulbum majusculum incrassatus, glaber; *stigmatis* rami exserti, utrinque recurvi, dense papillosi, appendicula longiuscula attenuato-acuta superati. *Achænia* matura oblonga, crassa, subtetragona, compressiuscula, glabra, margine angustissimo, hinc illinc paullulum elevato coronata, cæterum calva.

This species seems to be related nearest to *Gymnopsis? Costaricensis*, Bentham (in 'Compositæ Centro-Americanæ,' gathered by Örsted, p. 26, no. 114) which I have not seen, but it is said to have trinerved and broader leaves, with larger petioles. Moreover our plant seems to differ by its achænia being crowned by a very narrow but manifest margin. On the other hand it has the habit of a *Wulffia*, but is well distinguished from this genus by the achænia not being fleshy, and by the triplinerved leaves. The genus *Gymnopsis*, De Cand., however, includes indeed incongruous plants, as remarks Asa Gray in a Flora of North America, tom. 2. p. 317; and surely I do not know why De Candolle joined with it *Aldama* of De la Llave and Lexarza, which is so strikingly characterized by its achænia entirely enclosed by, and cohering with the at length increased chaff, and which truly merits to be restored.

591. Wulffia *platyglossa*, De Cand.? Prodr. tom. 5. p. 563. no. 3.—Frutex 10-pedalis. Panama, in savanas.

I am not quite certain whether Dr. Seemann's specimens, being in fruit only, without any trace of flower, belong to this species or to *Wulffia stenoglossa*, De Cand., which has much longer ligules. But having compared many specimens of both species, I found the leaves of *W. stenoglossa* being in general more acutely serrate and of a firmer texture, than in *W. platyglossa* and Dr. Seemann's plant. Both however seem to be distinguished by very slight characters.

592. Oyedæa *verbesinoides*, De Cand. Prodr. tom. 5. p. 577. no. 1.—Delessert, Icones Select. tom. 4. tab. 34. *Helianthus arboreus*, Willd.! Herbar. no. 16,443. Volcano of Chiriqui, Veraguas.

The specimen in Willdenow's Herbarium is collected by Humboldt at Caracas, but seems not to be described in the Nov. Gen. et Sp.—It occurs abundantly in Venezuela, whence I have seen specimens gathered by Moritz and others.

593. Bidens *leucantha*, Willd.? De Cand. Prodr. tom. 5. p. 598. no. 26. Common about Panama.

Dr. Seemann's specimens are all in fruit. The achænia are unequal in length, from 4 to 9 lines, somewhat quadrangular linear, some of them being densely hirsute, but the most part quite glabrous; the lower leaves are long-petioled, with a petiole of 1–2 inches, the terminal leaflet somewhat rhomboid-shaped is cuneate towards the base.—Abstracting from the flowering capitula, which are wanting in our specimens, they seem indeed to belong to the species which is considered by De Candolle as *Bidens leucantha*, Willd., whose short diagnosis in the Prodromus well agrees. The genuine species of Willdenow will remain for ever a problem, since in his own herbarium, no. 15,022, under this name are associated three incomplete specimens, belonging to three different species.

594. Bidens *tereticaulis*, De Cand. Prodr. tom. 5. p. 598. no. 31. Savanas about Panama.

The flower-heads of Dr. Seemann's specimens, being not developed, do not admit of a sure definition.

In their habit however they well agree with a specimen in my Herbarium, gathered by Otto in Venezuela, and with an authentic specimen gathered by Berlandier in Mexico (no. 2150), which I compared in the Royal Herbarium at Berlin. Dr. Seemann's plant only differs by the upper leaves being of a somewhat larger size, 3 inches long and 6–8 lines broad, their fine and acute serratures being quite the same. All three specimens are climbing plants, and almost quite glabrous, with a terminal trichotomous panicle, the upper leaves being all entire, even in Berlandier's authentic specimen!

595. Cosmos *sulphureus*, Cav., De Cand. Prodr. tom. 5. p. 606. no. 5. Panama.

I have compared an authentic specimen, gathered by Andrieux, near Oaxaca (no. 308). It is closely allied to *Cosmos caudatus*, H. B. K., nevertheless well distinguished from it by the thrice smaller scales of the exterior involucre, by the twice shorter achænia, and by the very deciduous awns of them.

596. Zexmenia* *Costaricensis*, Benth. in Örsted Compositæ Centro-Americ. p. 31. no. 128. (1853.) Volcano of Chiriqui, Veraguas.

I have not seen authentic specimens gathered by Örsted in Costa Rica, but Dr. Seemann's plant from Panama agrees well with Bentham's short description, although the leaves are less scabrous beneath, being almost strigillose scabrous above, which are said to be scabrous by a sparse pubescence on both sides. Moreover the outermost scales of the involucre are not always acute, the innermost not always obtuse, as stated by Bentham. They are in this respect most variable. Otherwise I have not met with the slightest difference between our plant and Bentham's description. The venation of the leaves of this species and some others is most singular and somewhat alike as in *Wulffia:* on each side of the midrib towards the base of it arise three strong ribs with very short intervals, of which the uppermost ones are the strongest, so that at first sight the leaves seem to be triple-nerved.

597. Verbesina *gigantea*, Jacq., Icon. Rar. tom. 1. tab. 175 (ex De Cand. in Prodr. tom. 5. p. 615. no. 16.)—Frutex 12-pedalis. Panama.

Dr. Seemann's specimen, the flower-heads of which are however scarcely developed, well agrees with De Candolle's diagnosis, l. c., and with the description of Swartz (Flor. Occident. tom. 3. p. 1368); but the leaves are scabrous above, and not "pubescent," as said by De Candolle, or "rugosiuscula," as stated by Swartz, ll. cc. Otherwise I find not the slightest difference. The upper leaves are not decurrent, the lower ones very narrowly. In three flower-heads carefully examined by me, I found only perfect flowers of the disc, with the tube being very hairy; in the fourth I observed but one single female ligulate floret besides them. The achænia are glabrous, but all immature. I have not seen an original specimen of this plant, and I had also not the opportunity of comparing the figure in Jacquin's Icon. Rar. It seems however nearliest allied to the doubtful *Ditrichum macrophyllum* of Cassini, whose generic character, given by De Candolle in Prodr. tom. 5. p. 619, I am not enabled to distinguish from *Verbesina*, Less.

598. Spilanthes *uliginosa*, De Cand. Prodr. tom. 5. p. 624. no. 25.—*Spilanthus uliginosa*, Swartz, Flor. Ind. Occident. tom. 3. p. 1291. On road-sides, about Panama.

Dr. Seemann's plant has the leaves almost entire, or somewhat repandly toothed. Otherwise it agrees well with De Candolle's diagnosis, and also with Swartz's description, ll. cc.; but the female florets are not bilabiate, as stated by Swartz (perhaps by a mistake). The achænia of them are triquetrous and triaristulate as in *Sp. tenella*, H. B. K., which however, as well as *Sp. debilis* of the same author, is nothing but a dwarf

* Asa Gray restored, in his 'Plantæ Wrightianæ,' tom. 1. p. 113, the older genus *Zexmenia* of De la Llave and Lexarza, combining with it *Lasianthæa*, De Cand., and the Mexican species of *Lipochæta*, De Cand. I adopt this act of justice the more readily, as the latter do not admit of a connection with the species of the Sandwich Islands.

form of this species. The achænia of the disc are compressed, biaristulate, and their florets occur four- and five-toothed often in the same flower-head.

599. Spilanthes *exasperata*, Jacq. Icon. Rar. tom. 3. tab. 584.—De Cand. Prodr. tom. 5. p. 626. no. 40. Volcano of Chiriqui, Veraguas.

I have seen an authentic specimen, raised in the garden at Schönbrunn, in Jacquin's Herbarium. It is nearly related to *Spilanthes uliginosa*, De Cand., but is well distinguished by a stouter and more branching stem, by somewhat shorter pedicels, being more crowded at the summit of the branches, and by the want of the female ligulate florets.

600. Synedrella *nudiflora*, Gærtn. de Fr. p. 456. tab. 171.—De Cand. Prodr. tom. 5. p. 629. no. 1. Panama.

A most variable plant, of which Dr. Seemann collected very luxuriant specimens, 1–3 feet high. One of the fascicled flower-heads, which are in general sessile, becomes often peduncled, the peduncle varying from 2–9 lines in length. The achænia of the disc are compressed, tri- or tetraquetrous, 2–3–4-aristate sometimes in the same flower-head, the compressed ones being often longitudinally striate on both sides, often striate on one, tuberculate on the other.

601. Chrysanthellum *integrifolium*, Steetz; glaberrimum, caulibus adscendentibus, foliis oblanceolatis basi attenuata integerrimis, versus apicem serrulatis, achæniis radii crassis teretibus longitudinaliter sulcatis tuberculo apicali coronatis cæterum calvis glabris, achæniis disci plano-compressis sterilibus (?). In savanas, about Panama.

Herba glaberrima, ut videtur biennis, *radice* simplici, *caulibus* procumbentibus, adscendentibus, basi parce foliatis, apice longiuscule nudis monocephalis, sub capitulo paullo incrassatis. *Folia radicalia* oblanceolata, basi in petiolum attenuata et integerrima, versus apicem serrulata, pollice paullo longiora, medio 3–4 lineas lata, *caulina* alterna, rara, multo minora. *Involucri* biserialis squamæ omnes lanceolato-ovatæ, medio nervosæ, brunneæ, margine pallido, enervi, latiusculo cinctæ, exteriores 5 latiores, interiores 10 angustiores, cæterum conformes. *Receptaculum* planum, paleaceum, *paleis* planis, gracilibus, anguste linearibus, nervo crasso brunneo perductis, margine pallidiore circumdatis. *Flores marginales* fœminei, ligulati, uniseriales. *Ligulæ* tubo brevissimo, cæterum planæ, lineares, glabræ, supra sulphureæ, subtus brunneæ, 3 lineas longæ, basi nervis 4 percursæ, quorum duo exteriores versus medium extrorsum spectantes, cum margine confluunt, duo interiores vero parallele percurrunt ligulam, cujus apicem bifidum attingunt; *ovarium* lineare, calvum; *stylus* profunde bifidus, basi simplex, glaber; *stigmatis* rami divergentes, læves, obtusiusculi. *Flores disci* hermaphroditi, numerosi, tubulosi, glabri, tubo brevi, fauce triplo vel quadruplo longiore, valde ampliata, 5-dentata, dentibus marginatis, subacutis, glabris, nervis 5 validis inter dentium sinus excurrentibus perducti. *Filamenta* filiformia, stricta. *Antheræ* nigricantes, basi rotundatæ, supra connectivum in appendiculam liberam ovatam continuam hyalinam uninervem productæ. *Pollinis granula* sphærica, undique echinulata. *Stylus* longe exsertus, basi simplex, glaber, profunde bifidus; *stigmatis* rami supra bifurcationem papillis latiusculis, more Vernoniacearum plurimarum, dense hispidi. *Achænia radii* fertilia, crassa, glabra, teretia, cylindrica, longitudinaliter 8-sulcata, sulcis in summum apicem excurrentibus, basin imam tamen nequaquam attingentibus, tuberculo apicali, centrali coronata, cæterum calva, sesquilineam longa. *Achænia disci* inania, linearia, plano-compressa, remote ciliata, abortiva (an semper?).

In the single fructiferous flower-head I have before me, all achænia of the ray are well ripened, whilst

all those of the disc-florets are abortive; therefore I should not think this is accidental. On the other hand, this fact is most singular, because the disc-florets are all perfect; and in the closely allied *Chrysanthellum procumbens*, Rich. (which has also the flower-heads heterocarpous), the achænia of the disc-florets are indeed flattened, with a winged margin, but not at all sterile, the achænia of the ray most resembling those of our species, and being not distinguishable except by the narrower portion of the not-furrowed base. Moreover *C. procumbens*, and all other species hitherto known, differ from ours at first sight, by the deeply and variously cleft leaves.

602. Calea *prunifolia*, H. B. K., Nov. Gen. et Sp. tom. 4. p. 294. no. 1. tab. 406.—De Cand. Prodr. tom. 5. p. 672. no. 6.—*Eupatorium rigidum*, Willd.! Herbar. no. 15,167 (non Swartz). Savanas about Panama.

Dr. Seemann's specimens are somewhat stouter, and have larger flower-heads, containing twenty to twenty-five florets. Otherwise there is not the slightest difference between them and the original specimens in Kunth's and Willdenow's Herbaria.

603. Tridax *procumbens*, Linn., De Cand. Prodr. tom. 5. p. 679.—*Balbisia elongata*, Willd.! Herbar. no. 16,366. In waste places about Panama.

604. Gnaphalium *oxyphyllum*, De Cand.? var. *β, semilanatum*, De Cand. Prodr. tom. 6. p. 225. no. 21, *β*. Volcano of Chiriqui, Veraguas.

I am not quite certain whether Dr. Seemann's specimens belong to this species, not having seen an original one of it. The short diagnosis given by De Candolle agrees well in general with them, but the leaves, even the uppermost ones, are scarcely decurrent; they are semiamplexicaul and really adnate, very acute at the summit, cobweb-like above, and densely covered with a whitish wool below, two inches or more long, 3–4 lines broad. The stem is floccose-lanate, terminating with a branching and compound corymb; the flower-heads are bell-shaped, containing about fifty flowers, of which 7–10 perfect; the scales of the involucre hyaline, shining, somewhat rufescent and very acute; the pappus is reddish. It is however closely allied to *Gnaphalium polycephalum*, Michx., but differs by the simple stem being not branched below the middle, by the much longer leaves, and by the almost acuminate scales of the involucre. I possess the same species from Caracas, gathered by Moritz.

605. Gnaphalium *spicatum*, Lam. (non Willd.), De Cand. Prodr. tom. 6. p. 232. no. 66. Volcano of Chiriqui, Veraguas.

606. Neurolæna *lobata*, R. Brown, De Cand. Prodr. tom. 6. p. 292.—*Conyza lobata*, Linn. —*Calea lobata*, Swartz. Panama, on the outskirts of forests.

Dr. Seemann gathered two forms of this common plant: one with a stout habit, having the chaff and involucral scales blunt; the other with a slender habit, and the chaff and involucral scales acute. Both however are certainly mere varieties of the same species.

607. Erechtites *carduifolia*, De Cand. Prodr. tom. 6. p. 294. no. 1.—Bentham in Örsted Compositæ Centro-Americanæ, p. 42. no. 174 (1853).—*E. sulcata*, Gardner in Lond. Journ. of Bot. tom. 7. p. 419 (teste cl. Bentham, l. c.). On road-sides and in waste places, Panama, Taboga.

Dr. Seemann's specimens are almost glabrous, but since Mr. Bentham, l. c., informs us that this species is most variable in pubescence, I am no longer doubtful that they really belong to this species, which however nearly approaches to *E. hieracifolia*, Raf., from which it differs by the more crowded corymb, the shorter pedicels and involucre, the inner scales of it being free and not cohering, and by the outer ones being

more squarrose. The *E. ambigua*, De Cand., l. c. p. 295. no. 5, of which I have seen an original specimen cultivated in the Berlin Botanic Garden, seems also to belong to this variable species.

608. Gynoxys *Cumingii*, Benth. in Örsted Compositæ Centro-Americanæ, p. 42. no. 176 (1853). Common about Panama.

A beautiful species, having the largest flower-heads of all species of the section *Scandentes* hitherto known. Our specimens accord with Mr. Bentham's diagnosis, l. c. It is however nearly allied to another new species, gathered by Moritz in the province of Trujillo, and described by C. H. Schultz Bip. under the name of *Gynoxys auriculata*, which is well distinguished by the broad and rounded amplexicaul base of the suddenly angustate and contracted petiole, by the somewhat smaller, though large capitula, and by the not canescent involucre. *G. Cumingii*, Benth., has the petioles not at all auriculate at their base. The habit is the same in both.

609. Senecio *arborescens*, Steetz (Tab. XXXI.); radiatus, arborescens, foliis petiolatis amplis penninerviis acutis basi breviter cuneatis supra glabris subtus pube fugaci vestitis oblongis profunde inciso-lobatis, lobis utrinque 5–6 maximis acutis subintegerrimis, sinubus rotundatis, corymbo terminali conferto polycephalo inter folia ultima subsessili foliisque triplo breviore, pedunculis floccoso-tomentosis, capitulis breviter pedicellatis 9-floris, involucri campanulati parce calyculati 8-phylli squamis inæquilatis, achæniis glaberrimis. Volcano of Chiriqui, Veraguas.

Fruticis, teste cl. Seemannii 8–10-pedalis, suppetit solummodo summitas florigera, foliis 4 synanthiis fasciculato-adproximatis obvallata, stipite, i. e. ramulo novello, lignescente, teretiusculo, floccoso, tomentoso, ferrugineo, vix pollicari, crassitie pennæ corvinæ insidens. *Folia* petiolata, supra glabra, subtus pube minima mox evanescente undique, præsertim secus nervos conspersa, *petiolo* supra canaliculato subtus floccis detergibilibus ferrugineis dense tomentoso 1½–2-pollicari, *limbo* semipedali et ultra, 4–5 pollices lato, basi breviter cuneato, apice acuto, profunde inciso vel pinnatilobo, penninervio, *lobis* utrinque 5–6, subæqualibus, sursum spectantibus, apice calloso terminatis, integerrimis, sive denticulo calloso obsoleto hinc inde auctis, 1–1½-pollicaribus, basi pollicem latis, basilaribus paullo minoribus, apicali sæpe breviter trilobo, cæteris incisuris tamen non majore, *sinubus* rotundatis, *nervis secundariis* subparallelis, a costa divergentibus, versus medium sæpissime bifurcatis, et plerumque geminatim in lobos excurrentibus. *Corymbus* terminalis, in pedunculo brevissimo vix 2-lineari, dense tomentoso, inter folia subsessilis, et in ramulos 4, umbellatim dispositos, basi nudos, supra medium corymbiferos, floccosos divisus, foliis triplo quadruplo brevior, petiolos superans, circiter 3-pollicaris. *Pedunculi* bractea lineari tomentosa stipati. *Capitula* pedicellis brevibus 2–3-linearibus bracteatis floccoso-arachnoideis insidentia, campanulata, 9-flora, 4 lineas alta. *Involucrum* uniseriale, bracteis 4–6 liberis, anguste linearibus, arachnoideis, vix adpressis calyculatum, 8-phyllum, disco dimidio brevius, 2 lineas longum; *squamis* dorso arachnoideis, intus glabris, plurinerviis, oblongis, æquilongis, sed inæquilatis, scilicet 3 angustioribus, trientem lineæ latis, acutis, immarginatis, 5 latioribus latitudinem semilineæ excedentibus, obtusiusculis, margine lato, scarioso, enervi, pallido cinctis. *Receptaculum* epaleaceum, angustum, eleganter favosum, *alveolis* margine membranaceo subdenticulato obvallatis. *Flores radii* 3, involucri squamis angustioribus oppositi, fœminei, glabri, *tubulo* 2 lineas longo, gracili, *ligula* æquilonga, plana, patente, ¾ lin. lata, apice contracta et breviter 3–4-dentata, nervis 3–4 obscuris perducta, cæterum lutea; *ovarium* lineare, glabrum, pappo setoso coronatum; *stylus* longe exsertus, glaber, basi simplex, supra medium bifidus; rami *stigmatis* utrinque recurvi, incrassati, adplanati, versus apicem paullulum attenuati, obtusi, parce papillosi. *Flores disci* 6, hermaphroditi, tubulosi, glabri, lutei, cum ovario vix lineari 3 lineas circiter longi (an-

Corrected proof. — issued Jan 1858. see to Journ. Bot. 59, 23. 1

theris exsertis haud imputatis), *tubo* gracili, dimidiam corollam æquante, *fauce* paullo ampliata, apice profunde 5-dentata, dentibus revolutis, obtusiusculis. *Filamenta* faucis basi inserta, longiuscule libera, plana, infra insertionem cum anthera teretia. *Antheræ* sub anthesi cum ipsis filamentorum apicibus totæ exsertæ, basi ecaudatæ, supra connectivum in appendiculam liberam, enervem, obtusam, anguste linearem productæ. *Pollinis granula* globosa, undique echinulata. *Ovarium* omnino ut in floribus fœmineis. *Stylus* basi valde incrassatus, glaber, paullo supra tubum stamineum eminens, ibique bifidus; rami *stigmatis* utrinque revoluti, adplanati, truncati, apiceque solo papillosi. *Achænia* (submatura) conformia, teretia, glaberrima, levissime striata, nigrescentia, callo basilari pallido insidentia, pappo multisetoso coronata, *setis* inæqualibus, albissimis, rigidulis, leviter serrulatis, basi liberis, flores hermaphroditos fere æquantibus.

A remarkable species. At first I thought it might be *Senecio hamamelifolius*, H.B.K. (Nov. Gen. et Sp. tom. 4. p. 179. no. 13); but this is said to be an herbaceous plant, with the leaves obtuse-angled, and the disc-florets much larger, etc. On the other hand it seemed to be the *Senecio grandifolius*, Lessing (Linnæa, tom. 5 (1830). p. 162. no. 362), a species which has been overlooked by De Candolle in his Prodromus, and Dr. Seemann's plant seems closely allied to it, but Lessing's plant is said to have an involucre of five scales, and eleven-flowered capitula, and leaves which are stated to be "irregulariter inciso-dentata," whilst Dr. Seemann's plant has the leaves deeply cut nearly to the middle of the limb, into large, acute, and almost regular lobes, so that they resemble those of some North American Oaks. Authentic specimens however I have seen neither of Humboldt's nor of Lessing's plant, gathered by Schiede at Jalapa.

Plate XXXI. Fig. 1, an entire capitulum; 2, flower of the disc; 3, stigma of the disc-flower; 4, flower of the radius; 5, stamen; 6, stigma of the radius-flower; 7, pappus hair:—*all magnified.*

Tribus V. Mutisiaceæ.

610. Lycoseris *latifolia*, Benth.—*Diazeuxis latifolia*, Don, De Cand. Prodr. tom. 7. p. 22. no. 1. Common about Panama.

The specimens gathered by Dr. Seemann are all male ones; their involucres are very woolly, and their pappus has sometimes few bristles; but this character is very inconstant, the number of bristles varying sometimes from ten to thirty in the same flower-head. Otherwise the specimens agree well with others gathered at Caracas by Moritz. The *Centroclinium altissimum*, Pœppig et Endlicher, Nov. Gen. et Sp. tom. 3. p. 52. tab. 259, belongs to this genus, and not to *Centroclinium*, Don, which is well distinguished by the aculeate receptacle, and by a very different habit. It is nearly allied to our species, but seems to differ in the want of the wool in the involucre, and the very short ligulate florets; the authentic specimen of it I have seen is a female one.

611. Leria *nutans*, De Cand. Prodr. tom. 7. p. 42. no. 1. In savanas about Panama.

Tribus VI. Nassauviaceæ.

612. Trixis *frutescens*, P. Browne, De Cand. Prodr. tom. 7. p. 68. no. 12.—Nomen vernacul. "Chiriqui." On the outskirts of wood, western parts of Panama.

Tribus VII. Cichoraceæ.

613. Lactuca *sativa*, Linn., De Cand. Prodr. tom. 7. p. 138. no. 41.—Nomen vernacul. "Lechuga." Cultivated in gardens, but does not succeed well.

LOBELIACEÆ.

614. Lobelia *Xalapensis*, H.B. et K., De Cand. Prodr. vol. vii. p. 372. In sunny places all over the Isthmus.

615. Lobelia *splendens*, Willd., De Cand. Prodr. vol. vii. p. 381. On the banks of rivulets and rivers, common in the neighbourhood of Panama.

616. Lobelia *laxiflora*, H.B. et K., De Cand. Prodr. vol. iii. p. 383. Volcano of Chiriqui, Veraguas.

VACCINIEÆ.

617. Satyria *Warszewiczii*, Klotzsch, Wlprs. Ann. vol. ii. p. 1081.—*S. clonantha*, Kl. l. c.! Volcano of Chiriqui, Veraguas (Bridges! Warszewicz! Seemann!).

This shrub, climbing on trees, is occasionally 40 feet high, and presents a most beautiful aspect; the leaves are sometimes 5–8 inches long, 3–3½ across, but they are generally much smaller; the flowers are in short racemes, and either appear in the axils of the leaves or more frequently on the old wood; the pedicels, calyx, and corolla are scarlet. The number of flowers on each raceme varies.

Proclesia Veraguensis, Kl., was not collected within the limits of the province of Veraguas, as the name would lead us to suppose, but in the neighbouring state of Costarica.

618. Thibaudia *pubescens*, H.B.K., De Cand. Prodr. vol. vii. p. 562. Volcano of Chiriqui, Veraguas, in half-shady places.

The geographical range of this plant extends over Bolivia (Pentland), Peru (M'Lean), New Granada (Purdie, Goudot), and Venezuela (Linden, no. 1). The bracts, calyx, and corolla are a fine rose-colour, which ultimately fades into white. The leaves are obtuse or more frequently acuminate.

619. Sophoclesia *flaccida*, Seem.; glaberrima, ramulis elongatis flaccidis, foliis subsessilibus ovato-oblongis obtusis basi rotundatis vel leviter cordatis, pedunculis folio longioribus bibracteatis, bracteis alternis acutis, floribus tetrameris, calycis tubo glaberrimo, corolla tubulosa subventricosa (alba), bacca globosa (grisea) 4-loculari, seminibus angulatis.—*Sphyrospermum flaccidum*, Seem. olim! Island of Cacagual, Darien, growing on the trunks of trees.

An elegant little evergreen shrub, with white flowers and sweet edible berries. It differs from *S. cordifolia*, Klotzsch, in having a glabrous calyx, from *S. nummulariæfolia*, Kl., *S. subscandens*, Kl., and *S. ovata*, Kl., in having tetramerous flowers. In habit it quite agrees with the other species, growing on the trunks of old trees, having slender rooting branches, coriaceous leaves, solitary peduncles, and white flowers. The range of the genus seems to be confined to the Republics of Venezuela, Ecuador, and New Granada. The locality in which *S. flaccida* has been found is remarkable, because all the other species are known to grow at an elevation of several thousand feet above the sea, in a temperate climate, while *S. flaccida* was gathered in the low coast region, in one of the hottest parts of the world, a most unusual spot for any *Vaccinieæ*, making it probable that the seeds must have been carried thither by the violent rains, so prevalent in Southern Darien, and that the focus of this species will have to be looked for in the Cordillera.

620. Macleania *cordifolia*, Benth., Wlprs. Rep. vol. vii. p. 415. Island of Cacagual, Darien, either terrestrial or epiphytal.

It is a character common to all *Macleaniæ* to have large tuberous roots, at least I have never seen a species without them. The present has often tubers weighing as many as two pounds. Some *Macleaniæ* have been called parasitical, but they are never truly so in the modern acceptation of that term; epiphytical they are frequently, growing on trees together with Mosses, Ferns, and *Orchideæ*, but they are more generally terrestrial. *M. cordifolia*, like *Sphyrospermum flaccidum*, was found by me in the lower coast region, both in Darien and Choco. When growing in soil it is a shrub about 4 feet high, when on trees it is much smaller. The flowers are scarlet, tipped with white; the berries are quinquangular, white and sweet, but slightly astringent.

ERICACEÆ.

621. Clethra *quercifolia*, Schlecht. Wlprs. Rep. vol. ii. p. 726.—*C. obovata*, Hook. et Arn. Bot. Beech. p. 302 (non Ruiz et Pav.) !—Nomen vernacul. "Nansillo." On the slopes of the Volcano of Chiriqui, Veraguas.

A tree, averaging in height about 35 feet, and ranging geographically from Veraguas, over Central America (Barclay), to Mexico. *C. obovata* of Ruiz and Pavon appears to be a different plant from this; and again the diagnosis of *C. obovata* in De Candolle's Prodromus (vol. vii. p. 589) differs from the figure published in the 'Flora Peruviana' in so far as the lobes of the corolla are fimbriated, and not entire, as stated.

MYRSINEACEÆ.

622. Myrsine *myricoides*, Schlecht., De Cand. Prodr. vol. viii. p. 100. Volcano of Chiriqui, Veraguas.

623. Ardisia (§ Parathesis) *crenulata*, Vent. (non Lodd.), De Cand. Prodr. vol. viii. p. 129. Cape Corientes, Darien, and Paredez Islands, Veraguas.

624. Ardisia (§ Micranthera) *coriacea*, Swartz, De Cand. Prodr. vol. viii. p. 122.—Nomen vernacul. "Fruta de pavo." In savanas, and on the outskirts of forest between Panama and Cruces.

The fruit of this shrub or small tree is eaten by the inhabitants; it is black and rather insipid.

625. Ardisia (§ Euardisia) *compressa*, Kunth, De Cand. Prodr. vol. viii. p. 125. Forests about Cruces.

626. Ardisia (§ Euardisia) *decipiens*, De Cand. Prodr. vol. viii. p. 125. In woods near Panama.

My specimens agree best with De Candolle's diagnosis of *A. decipiens*, but also more or less with that of *A. Turbacensis*, *A. Orinocensis*, and *A. propinqua*, and I almost suspect that too many species have been made of one plant. The panicles of my specimens are either lateral or terminal, and in the latter case much branched and twice shorter than the leaves.

THEOPHRASTACEÆ.

627. Clavija sp. On woods near Panama viejo.

The specimens of this species have unfortunately been lost; the shrub from which they were gathered was, as I learn from my diary, about 12 feet high.

628. Jacquinia *macrocarpa,* Cav., De Cand. Prodr. vol. viii. p. 150. On the sea-shore of the Pacific Ocean, from Chorrera to San Carlos.

SAPOTACEÆ.

629. Chrysophyllum *Cainito,* Linn. De Cand. Prodr. vol. viii. p. 157.—Nomen vernacul. "Caimito." Grows wild in various parts of the Isthmus, and is also extensively cultivated on account of its edible fruit.

630. Sapota *Achras,* Mill., De Cand. Prodr. vol. viii. p. 174.—Nomen vernacul. "Nispero." Found wild in most of the forests of the country, and is also cultivated on account of its edible fruit.

The wood of this tree is extensively used for building purposes; the fruit is consumed in great quantities.

EBENACEÆ.

631. Diospyros *tetrasperma,* Swartz, De Cand. Prodr. vol. viii. p. 222. Savanas about Panama.

STYRACACEÆ.

632. Symplocos *Martinicensis,* Jacq., De Cand. Prodr. vol. viii. p. 249. Veraguas.

633. Styrax *punctatum,* De Cand. Prodr. vol. viii. p. 264.—Nomen vernacul. "Saumerio." Volcano of Chiriqui, and mountains of Eastern Veraguas.

In the stem of this tree is contained dark-brown odoriferous gum-resin, which is used as frankincense in the churches of Veraguas, and obtained by the following process:—an old tree is felled, and after it has lain for several years on the ground, and begins to decay, the external portion of its wood is removed with a knife, when towards the centre the gum-resin is found collected in greater or smaller masses.

LOGANIACEÆ.

634. Spigelia *anthelmia,* Linn., De Cand. Prodr. vol. ix. p. 7. In dark forests, Panama; Cupica; Chagres (Fendler, no. 283).

635. Mitreola *petiolata,* Torr. et Gray, De Cand. Prodr. vol. ix. p. 8. In dark woods at Santiago de Veraguas.

636. Strychnos *Panamensis,* Seem.; ramis scandentibus, petiolis foliisque pubescentibus demum glabratis, foliis ovato-oblongis acuminatis basi rotundatis vel acutis triplinerviis, cirrhis superne incrassatis, corymbis terminalibus, calyce pubescente 5-fido lobis ovato-lanceolatis, corolla hypocraterimorpha punctata, tubo gracili, lobis obtusis vel subtruncatis. Island of Taboga.

Allied to *S. triplinervia,* Mart. (*S. Gomesiana,* Casaretto!), but differing chiefly in the lobes of the calyx being ovato-lanceolate, not subulate, the corolla punctated, not tomentose, and the lobes of the corolla obtuse, not acute.

637. Strychnos *Darienensis,* Seem.; ramis scandentibus petiolisque puberulis, foliis ellipticis vel

oblongo-ovatis acuminatis basi in petiolum attenuatis tri- vel quintuplinerviis supra glabris subtus ad nervos puberulis, cirrhis nullis, racemis paniculatis axillaribus pubescentibus, laciniis calycinis ovato-lanceolatis, corolla hypocraterimorpha extus glabra, lobis acutis.—Island of Coyba and Coast of Darien.

A climbing sea-side shrub, closely allied to *S.? cogens*, Benth.; the berry is about 1½ inches in diameter, and yellow; the seeds are flat, and about 6 lines broad.

APOCYNEÆ.

638. Allamanda *cathartica*, Linn., De Cand. Prodr. vol. viii. p. 318.—Chagres (Fendler).

639. Rauwolfia *heterophylla*, Rœm. et Schult., De Cand. Prodr. vol. viii. p. 338. In waste places, Panama and Island of Taboga.

This species is diffused over Mexico (Galeotti, Deppe), Central America (Barclay), New Granada (Seemann), and Ecuador (Seemann). In the latter state I gathered it about Esmeraldas, at which place it is known by the name of *Contra de vivora*, and its root employed as an antidote for snake-poison. Whether, as such a remedy, it is efficacious, I have not been able to ascertain.

640. Thevetia *neriifolia*, Juss., De Cand. Prodr. vol. viii. p. 343.—Nomen vernacul. "Campanilla." In waste and stony places about Panama, often used for making hedges.

This shrub is commonly cultivated in the gardens of tropical America for ornamental purposes, and, having thence escaped, has obtained a wider geographical range than it originally must have enjoyed. I do not think it is a true native of the Isthmus; at least I have never observed it in any locality except the neighbourhood of towns and other inhabited places. Nor do I know which country may be looked upon as its native land, as the conditions under which it occurs in the Isthmus are the same in all the countries in which I have met it, including several of the West Indian Islands, Ecuador, Peru, and Mexico.

641. Thevetia *nitida*, De Cand. Prodr. vol. viii. p. 344.—Nomen vernacul. "Cojon del gato." On the outskirts of forests, from Chagres (Fendler) to Panama.

A shrub from 4 to 6 feet high; flowers white; fruit bright scarlet. The vernacular name of this plant is derived from the shape of the fruit, which, as the Isthmians fancy, bears some resemblance to the testicles of the cat (cojones del gato).

642. Tabernæmontana *amygdalifolia*, Jacq., De Cand. Prodr. vol. viii. p. 367.—Nomen vernacul. "Jasmin del monte." From Tole to David, Veraguas.

This shrub (mentioned, by a clerical error at p. 72 of this work, as *T. alba*, Mill.) is about 6 feet high, and produces fine blossoms, which emit an odour not unlike that of the *Jasminum Sambac*; hence the popular name, "Jasmin del monte," an appellation also current at Cartagena de Indias. *T. amygdalifolia* was found by Cuming and Watts in New Granada, and by Moritz in Venezuela.

643. Tabernæmontana *grandiflora*, Jacq., De Cand. Prodr. vol. viii. p. 368. From Chagres (Fendler) to Panama, and also in Darien.

Hooker's Herbarium contains specimens of this plant from Guayana (Schomburgk), Surinam (Hostmann), Venezuela (Linden), and New Granada (Linden, Cuming, no. 1121).

644. Vinca *rosea*, Linn., De Cand. Prodr. vol. viii. p. 382.—Nomen vernacul. "Maravilla del tiempo." In waste places, common in the neighbourhood of inhabited places.

645. Plumeria *rubra*, Linn., De Cand. Prodr. vol. viii. p. 390.—Nomen vernacul. "Caracucha colorada." Cultivated and naturalized in various parts of the Isthmus.

646. Plumeria *bicolor*, Ruiz et Pav., De Cand. Prodr. vol. viii. p. 391.—Nomina vernacul. "Caracucha amarilla, Caracucha blanca, Caracucha cintaraza, et Caracucha fina." Cultivated, and, as the foregoing species, naturalized in various parts of the Isthmus.

I think there is little doubt that *P. carinata*, *P. tricolor*, and *P. incarnata* are mere varieties of this species; indeed, I have considered them as such, and consequently quoted under *P. bicolor* the vernacular names for these supposed varieties. The Plumerias are favourite flowers with the Isthmians; they are seen in almost every garden, and on account of their beautiful and penetrating fragrance are much used in religious processions and other festivities. A sunny, exposed situation is essential to their success in cultivation; in shady places they produce plenty of leaves, but few or no flowers.

647. Prestonia *tomentosa*, R. Brown, De Cand. Prodr. vol. viii. p. 429. Savanas near Panama.

My specimens agree sufficiently well with those collected by Claussen (no. 339) in Brazil, to induce me to consider them as belonging to *P. tomentosa*, R. Brown, to which De Candolle (l. c.) has referred them; in my specimens, as well as those of Purdie from Santamarta, which belong to the same plant, the tube of the corolla is quite glabrous, the appendices of the corolla are obtuse or even emarginate, and longer than the corona; but these discrepancies do not appear to me to be important enough for creating a new species, especially as so little is known about the real *P. tomentosa*, R. Brown, which, after all, may turn out to be a plant quite different from what De Candolle supposes it to be.

648. Echites *trifida*, Jacq., De Cand. Prodr. vol. viii. p. 454.—*E. tubulosa*, Benth. in Hook. Journ. of Bot. vol. iii. p. 249! Savanas near Panama.

649. Echites *lasiocarpa*, De Cand. Prodr. vol. viii. p. 463.—*E. auriculata*, Stadelm., De Cand. l. c. p. 459. no. 59! Between Tole and David, Province of Veraguas.

650. Echites (§ Euechites) *Veraguasensis*, Seem.; fruticosa, volubilis, ramis pubescentibus demum glabris, foliis petiolatis ovato-oblongis basi cordatis multiglandulosis apice acuminatis supra glabris subtus ad axillas nervorum villosis, racemis axillaribus 5–8-floris bracteatis, bracteis ovatis acutis, laciniis calycinis ovatis acutis vel acuminatis glandulis destitutis, corollæ tubo a medio infundibuliformi, fauce patente, lobis obovatis obtusis, extus glabro, intus ad basim infundibuli villoso, staminibus infundibulo insertis, filamentis villosis, antheris glabris, ovario styloque glabris, folliculis . . . Volcano of Chiriqui, Veraguas.

This species agrees in many essential points with *E. laxa*, R. et Pav., but the corolla of that plant is stated to be yellow, while in *E. Veraguasensis* it is, with the exception of the tube, which is of that colour, dark purple; the lobes of the corolla are also in *E. Veraguasensis* obovate obtuse. A species closely allied to the latter was collected by Purdie in the lower mountains of Quindiu, differing however in its corolla being outside partly tomentose. *E. Veraguasensis* has petioles about 1 inch long; lamina of the leaves from $3\frac{1}{2}$ to 4 inches long, and from 1 to $1\frac{1}{2}$ broad; corolla $2\frac{1}{2}$ inches long, rendering it a highly ornamental species.

ASCLEPIADEÆ.

651. Schubertia *tristis*, Seem.; foliis ovato-cordatis cuspidatis, umbellis paucifloris, corolla tota glaberrima, laciniis ovatis obtusissimis tubum corollæ æquantibus. Rio de Santamaria, between Santiago de Veraguas and Natá.

A scandent shrub; with the exception of the corolla, and the inside of the calyx, more or less hirsute, hair dark-brown; leaves opposite generally (including the petiole), 6 inches long, and from 3½ to 4 inches broad, petiole 1 inch long; flowers axillary, umbellate, lobes of the calyx ovate, acuminate, and as long as the tube of the corolla; tube of the corolla of a light brown, and lobes of a dark chocolate-colour, giving the flowers a dull appearance. Follicles unknown. The species is allied to *S. graveolens*, Lindl., but evidently distinct.

651. Sarcostemma *bilobum*, Hook. et Arn., Bot. Beech. p. 438.—*S. cynanchoides*, Dcne., De Cand. Prodr. vol. viii. p. 540! Climbs over shrubs in the savanas about Panama. Flowers in October and November.

652. Asclepias *curassavica*, Linn., De Cand. Prodr. vol. viii. p. 566.—Nomina vernacul. "Niño-muerto" et "Malcasada." Common all over the country.

An infusion of the leaves of this plant is used as a purgative by the natives.

653. Gonolobus *virescens*, Dcne., De Cand. Prodr. vol. viii. p. 596. Cerro Ancon, near Panama.

654. Blepharodon *mucronatum*, Dcne., De Cand. Prodr. vol. viii. p. 603. Near Panama.

655. Marsdenia *maculata*, Hook. Bot. Mag. t. 4299. Losaria, near Panama.

656. Marsdenia *elliptica*, De Cand. Prodr. vol. viii. p. 616.—Iguana Island, Bay of Panama.

Under the name of "Algodon de Lima" is cultivated in the gardens of Panama and Taboga an East Indian *Calotropis*, probably *C. procera*, R. Brown; I am not able to state positively whether it is that species, as the flowers of my specimen have been imperfectly preserved.

GENTIANACEÆ.

(*Auctore A. H. R. Grisebach.*)

657. Apophragma *tenuifolium*, Griseb. in De Cand. Prodr. vol. ix. p. 56. Hacienda de Juan Lanas, Province of Panama.

658. Cicendia *Quitensis*, Griseb. in Linnæa, vol. xxii. p. 33.—*Erythræa Quitensis*, Kunth, De Cand. Prodr. l. c. p. 58. Chorrera, Province of Panama.

659. Coutoubea *densiflora*, Mart., De Cand. Prodr. vol. ix. p. 66. From Santiago de Veraguas to Panama.

660. Xestæa *lisianthoides*, Griseb. in Linnæa, vol. xxii. p. 36. Panama.

661. Schultesia *stenophylla*, Mart., De Cand. Prodr. vol. ix. p. 67.—Nomen vernacul. "Canchalagua." Panama, in savanas.

662. Schultesia *heterophylla*, Miq. in Linnæa, vol. xix. p. 136.—Griseb. ibid. xxii. p. 34.—Nomen vernacul. "Canchalagua." Panama, in savanas.

"Both of these Schultesias are called Canchalagua by the natives, and are used as febrifuges; the name Chanchalagua, probably derived from the Quichua language, is applied by the Spanish Americans to several other *Gentianeæ*, besides those here enumerated."—*B. S.*

663. Lisianthus *trifidus*, Kth., De Cand. Prodr. vol. ix. p. 75. Chorrera, on road-sides.

The specimens being without flower, the determination is rendered somewhat doubtful, but they resemble very much those collected by Moritz at Merida.

664. Leianthus *Seemanni,* Griseb. MSS.; caule suffruticoso teretiusculo, foliis breviter petiolatis ovatis acuminatis, cymis multifloris, calycis profunde 5-fidi exalati segmentis lanceolato-linearibus acuminatis, corollæ tubo gracili sensim ampliato, lobis oblongo-lanceolatis cuspidato-acuminatis genitalia parum superantibus. Bay of Piñas, Darien.

A half-shrubby plant from 3 to 4 feet high, with yellow flowers. It has the habit of *L. longifolius*, but the leaves are broader, the largest being nearly two inches across, and the calyx is deeply cleft and without wings.

665. Voyria *simplex,* Griseb. MSS.; caule simplici tenello unifloro, squama solitaria abbreviata medio cauli inserta, bracteis calyceque nullis, corollæ hypocraterimorphæ tubo cylindraceo-campanulato lobis cæruleis oblongis obtusis duplo longiore, ovario breviter stipitato.—Proxima *V. nudæ,* sola corollæ forma distinguenda. Panama, in dark forests; only observed during the wet season.

Some botanists maintain that *V. nuda* ought to be separated from *Gentianeæ*, and referred to some Monocotyledonous Order; but the quinary arrangement of the flower and the general conformity of the structure of that species with other Voyrias, are facts opposed to such a separation. The corolla of this species is of a deep blue colour.

666. Limnanthemum *Humboldtianum,* Griseb. in De Cand. Prodr. vol. ix. p. 140. Panama, in swamps and rivulets.

CONVOLVULACEÆ.

667. Rivea *tiliæfolia,* Chois., De Cand. Prodr. vol. ix. p. 325.—Nomen vernacul. "Batatilla." Common on the sea-shores.

668. Quamoclit *hederæfolia,* Chois., De Cand. Prodr. vol. ix. p. 336. Rio Grande de Panama.

669. Quamoclit *vitifolia,* Don, De Cand. Prodr. vol. ix. p. 336. Volcano of Chiriqui, Veraguas.

Quamoclit *vulgaris,* Chois. l. c., is cultivated for ornamental purposes in the gardens of Panama, but has not as yet been found wild in any part of the Isthmus.

670. Batatas *edulis,* Chois., De Cand. Prodr. vol. ix. p. 338.—*Convolvulus Batatas,* Linn. Am. Ac. vol. vi. p. 121.—Nomina vernacul. "Batata" et "Camote." Cultivated extensively on account of its esculent tubers.

671. Batatas *quinquefolia,* Chois., De Cand. Prodr. vol. ix. p. 339. In hedges and amongst shrubs, common about the city of Panama.

672. Pharbitis *acuminata,* Chois., De Cand. Prodr. vol. ix. p. 342. In the neighbourhood of the city of Panama.

673. Calonyction *speciosum,* Chois., De Cand. Prodr. vol. ix. p. 345. Island of Taboga, and between Panama and Santiago de Veraguas.

674. Ipomœa *Pes-capræ,* Swartz, De Cand. Prodr. vol. ix. p. 349. Common in the sand of the sea-shores of both the Atlantic and Pacific Oceans; Chagres (Fendler, no. 239).

675. Ipomœa *urbica,* Chois., De Cand. Prodr. vol. ix. p. 349. Common on the sea-shores.

The glutinous juice of this and the preceding species is used in Ecuador as paste in making cigars.

676. Ipomœa (§ Orthipomœa!) *fistulosa,* Mart., De Cand. Prodr. vol. ix. p. 349.—*Batatas? crassicaulis,* Benth. Bot. Sulph. p. 134! Swamps near the village of Anton, Province of Panama.

This species, being an erect shrub, from 4 to 6 feet high, has to be placed in the section *Orthipomœa;* its stamens are of unequal length, and its capsule is bilocular, each locule having two seeds. It was found at Guayaquil (Sinclair, Jameson), Guatemala (Friedrichsthal), Santarem (Spruce), and Rio de San Francisco, Brazil (Gardner). At the latter place it is, according to Gardner's memoranda in Hooker's Herbarium, vernacularly termed "Matta-Cabra," and supposed to be poisonous to goats.

677. Ipomœa *pterodes,* Chois., De Cand. Prodr. vol. ix. p. 361. Rio de Santamaria, Province of Veraguas.

The peduncles bear often two to four flowers, and the colour of the corolla is rather more salmon-colour than yellow.

678. Ipomœa *sidæfolia,* Chois., De Cand. Prodr. vol. ix. p. 372.—*I. Lindenii,* Martens et Gall. Bullet. de l'Acad. de Brux. xii. 2. p. 264! About Panama.

This species is either almost glabrous, or covered more or less with hair.

679. Ipomœa *umbellata,* Mey., De Cand. Prodr. vol. ix. p. 377.—*S. mollicoma,* Miq. Stirp. Sur. select. 132. tab. 37!—*Convolvulus densiflorus,* Hook. et Arn. Bot. Beech. p. 303! fide specim. in Herb. Hook.—Benth. Bot. Sulph. p. 135 et 182! In sunny places, common in the Provinces of Panama and Veraguas; Chagres (Fendl. no. 241).

In Hooker's Herbarium there are specimens of this plant from Mexico (Jurgensen, Buchy), road between San Blas and Tepic (Coulter), Realejo (Sinclair), Nicoya (Sinclair), Esmeraldas, Ecuador (Hall), Guayaquil (Sinclair), Surinam (Miquel), Pernambuco (Gardner), Jamaica (Distan), Trinidad (Lockhart), Cuba (Greene), and Fernando Po (T. Vogel).

680. Ipomœa *fastigiata,* Sweet, De Cand. Prodr. vol. ix. p. 380. Banks of the river Pequeni, Province of Panama.

681. Ipomœa *commutata,* R. et Sch., De Cand. Prodr. vol. ix. p. 282. From Panama to Santiago de Veraguas.

682. Ipomœa *variabilis,* Chois., De Cand. Prodr. vol. ix. p. 383.—*I. brachypoda,* Benth. Bot. Sulph. p. 135!—Nomen vernacul. "Batatilla." Common all over the country, ascending the mountains to a height of 4000 feet.

Used as fodder for cattle, and considered very nutritious.

683. Ipmoœa *sp.*—Nomen vernacul. "Boton de terciopelo." Veraguas.

The capsule of this species is quite glabrous, but the seeds are densely covered with short, stiff, black hair, giving them the appearance of black velvet buttons, hence the vernacular name. I have never met with the plant myself, but obtained the capsules now preserved in the Kew Museum, from my friend Don Juan Ansoatigui.

684. Jacquemontia *lactescens,* Seem.; lactescens, caule foliisque rufo-velutinis, foliis ovato-cordatis acuminatis, pedunculis apice capitato 4–6-floris, floribus bracteatis, bracteis ovatis vel obovatis obtusis

mucronatis extus velutinis intus glabris, corolla extus hirsutissima intus glabra calyce duplo longiore, ovario villoso. Cerrō de Lancon, near the city of Panama; also collected about Panama by Cuming (no. 1158).

This species, having, like several other *Convolvulaceæ*, a milky juice, is closely allied to *I. pycnocephala*, Benth. (Bot. Sulph. p. 137), from which however it is easily distinguished by its externally hirsute corolla. The petioles are generally more than an inch long; the lamina of the leaves is from 2–2½ inches long, and about 1½ inch broad. The flowers look at first sight like those of *Argyreia capitata*, Chois. The peduncles are twice as long as the petioles. The bracts and sepals are of equal length. The corolla is 1 inch and 3 lines long, and white; the capsule is unknown.

685. Jacquemontia *azurea*, Chois., var. alba, Seem.; floribus albis. City of Panama.

686. Evolvulus *sericeus*, Swartz, De Cand. Prodr. vol. ix. p. 443. Savanas of Panama and Veraguas.

687. Evolvulus *nummularius*, Linn., De Cand. Prodr. vol. ix. p. 445. On road-sides and in waste places, from Panama to Santiago de Veraguas.

688. Evolvulus *villosus*, Ruiz et Pav., De Cand. Prodr. vol. ix. p. 448. In savanas near Panama.

Besides the *Convolvulaceæ* here enumerated, several others were collected by Fendler at Chagres.

POLEMONIACEÆ.

689. Lœselia *glandulosa*, G. Don, De Cand. Prodr. vol. ix. p. 319. Volcano of Chiriqui, Veraguas; also collected by me in the Serra Madre, Mexico.

690. Lœselia *ciliata*, Linn., De Cand. Prodr. vol. ix. p. 319. Village of Araijan, Province of Panama; and found by me in the Cerro de Pinal, Mexico.

L. ciliata, Linn., and *L. involucrata*, G. Don, are so closely allied that it is very difficult to distinguish them, if they are indeed distinct species, or not mere forms, as Mr. Bentham supposes. However, the *L. involucrata* is said to have blue flowers; the plant here noticed has pale yellow ones.

HYDROLEACEÆ.

691. Hydrolea *spinosa*, Linn., De Cand. Prodr. vol. x. p. 181.—Nomen vernacul. "Yierba del Chivo." Common in swamps all over the country; Chagres (Fendl. no. 236).

This species was collected at Pará (Spruce), and Merida (Moritz).

SOLANACEÆ.

(*Auctore J. Miers.*)

692. Solanum *tuberosum*, Linn., De Cand. Prodr. vol. xiii. p. 31.—Nomen vernacul. "Papas." Cultivated on the higher mountains of Veraguas.

693. Solanum *nodiflorum*, Jacq., De Cand. Prodr. vol. xiii. p. 46. Waste places about Panama.

694. Solanum *Caribæum*, Dun. in De Cand. Prodr. vol. xiii. p. 48. Common in fields, Province of Panama.

695. Solanum *callicarpæfolium*, Kth. et Bouché, De Cand. Prodr. vol. xiii. p. 107. Island of Taboga and vicinity of Panama.

696. Solanum *Schlechtendalium*, Walp., De Cand. Prodr. vol. xiii. p. 109. Montaña de Chorcha, Veraguas.

Frutex 5–6-pedalis, floribus albis, calyce albido-tomentoso, petalis extus tomentosis, intus glabris.

697. Solanum *verbascifolium*, Linn., var. *viridi-scabrum*.—De Cand. Prodr. vol. xiii. p. 115. David, Veraguas.

698. Solanum *nutans*, Ruiz et Pav., De Cand. Prodr. vol. xiii. p. 128: var. *secundiflorum*. *S. leucocarpon*, Rich., affine: an potius species distincta?; ramis suffruticosis flexuosis, foliisque glaberrimis; foliis geminis, altero minore, oblongis, utrinque acuminatis, integerrimis, brevissime petiolatis; racemo brevi, oppositifolio, multifloro, pedunculo simplici, rarius furcato, floribus creberrime 2-serialiter secundis, pedicellis imo articulatis, plerisque cito caducis, in fructu apice incrassatis; bacca calyce parvo suffulta. Volcano of Chiriqui, Veraguas.

The specimen 1072 (probably in a younger state of growth) corresponds with the figure and description of the 'Flora Peruviana;' the others evidently are referable to the section *Leiodendra* of M. Dunal. This is probably a distinct species near *S. leucocarpon*, which it resembles in many particulars; it also approaches *S. arboreum*, H. B. K., but the inflorescence is not cymose; it bears some resemblance to the figure of *S. acuminatum*, Ruiz et Pav., but its leaves do not blacken in drying; the raceme is shorter, and the flowers more densely placed. The leaves become pale in drying, of similar colour on both sides, opaque, with ten to twelve pairs of nerves, immersed above, prominent below; the larger leaf being 8 inches long, $2\frac{3}{4}$ inches broad, on a deeply-channelled petiole 3 lines in length, the smaller leaf being $2\frac{1}{2}$ inches long, 1 inch broad, on a petiole of 2 lines. The peduncle is 6 to 9 lines long, bare of flowers at the base for a length of 2 lines, hence simple or furcated, and marked by a biserial line of very closely-approximated cicatrices, from which all the flowers have fallen excepting two or three upper ones, which alone remain, and become fructiferous; the flowers originally are about sixty in number, densely secund; the fructiferous pedicels, thickened towards the apex, are 5 lines long; the five-toothed calyx is persistent, and the berry, yet immature, is 5 lines in diameter.

699. Solanum *oblongum*, Ruiz et Pav., De Cand. Prodr. vol. xiii. p. 148. Woods near Panama.—Frutex 4–6-pedalis.

700. Solanum *brachybotryon*, Dun. in De Cand. Prodr. vol. xiii. p. 212. Volcano of Chiriqui, Veraguas.

The few spines seen on the stem are short, compressed, very broad at their base, and sharply recurved; the leaves are spineless, stellately pubescent above, and densely tomentose below, with the nervures and reticulated venation prominent; the segments of the calyx are stellately pubescent inside as well as outside.

701. Solanum *Juripeba*, Rich., De Cand. Prodr. vol. xiii. p. 214. Very common all over the Isthmus.

The upper portion of the branches and the uppermost leaves are unarmed, but lower down they are furnished with strong straight spines placed at right angles, compressed, subulate, and 4 lines long. The leaves are sparsely, scabrously, and stellately pilose above, of a greenish colour, while beneath they are of a

glaucous hue, and covered with fine, stellate pubescence, the nervures and veins being slender and little prominent; the calyx and corolla externally are scabridly pubescent, the anthers are long, linear, connivent, and three-fourths the length of the corolla.

702. Solanum *scabrum*, Vahl, De Cand. Prodr. vol. xiii. p. 216. In savanas, common all over the Isthmus.

703. Solanum *palinacanthum*, Dun. in De Cand. Prodr. vol. xiii. p. 245. Volcano of Chiriqui, Veraguas.

Aculei densissime patentes vel retrorsi, apice aciculares, in caule creberrimi, in foliis utrinque sparsi.

704. Solanum *mammosum*, Linn., De Cand. Prodr. vol. xiii. p. 250.—Nomen vernacul. "Uña de gato." Savanas about Panama.

Densissime hirsutum, pilis simplicibus patentibus vel retrorsis. *Folia* $2\frac{3}{4}$ poll. longa, $2\frac{3}{4}$ lata; petiolus $1\frac{3}{4}$ poll. *Calyx* fere ad basim 5-partitus, laciniis linearibus pilis retrorsis vestitus. *Corolla* violacea, segmentis lanceolatis. *Antheræ* lineari-oblongæ, apice attenuato-rostratæ, 2-porosæ. *Stigma* parvum, 2-lobum.

705. Solanum *torvum*, Sw., De Cand. Prodr. vol. xiii. p. 260. In sunny places, common over the whole country.

This is probably only a variety of the above widely-spread and cosmopolitan species; it is almost unarmed, very few short spines being seen upon the stemlets; it is wholly tomentose, not scabrid. The leaves are from four to five inches long, $3\frac{1}{2}$ to 4 inches broad, on a petiole of 1 to $1\frac{1}{2}$ inch in length; they are geminate, one being somewhat smaller; both sides are ochreously tomentose, with fine soft stellated hairs; above they are more smoothly velutinous, with immersed nervures, below they are paler, with raised nerves and reticulated veins, and covered with woolly tomentum; the panicle springs out of the stem midway between the axils, is bi- or tri-fidly branched near the base of the peduncle, and is 2 inches long; the pedicels are 5 lines long in flower, 7 lines in fruit; the flowers are 5 to 6 lines in diameter.

706. Solanum *ovalifolium*, H. B. K., De Cand. Prodr. xiii. p. 269. Town of David, Veraguas.

707. Solanum *Quitoënse*, Lam., De Cand. Prodr. vol. xiii. p. 352.—Nomen vernacul. "Naranjita de Quito." In savanas, common over the whole Isthmus.

The leaves are 18 inches long, and $13\frac{3}{4}$ inches broad, on a thick petiole $2\frac{1}{2}$ inches in length.

708. Solanum *esculentum*, Dun., De Cand. Prodr. vol. xiii. p. 355. Cultivated in the gardens of Panama.

709. Cyphomandra *betacea*, Sendtn. Flor. Bras. fasc. vi. 119.—Dun. in De Cand. Prodr. vol. xiii. p. 393.—*Pionandra betacea*, Miers, Ill. So. Am. Pl. i. 38.—*Solanum betaceum*, Cav. Icon. tab. 524.—Nomen vernacul. "Monca." Between Mesa and Santiago de Veraguas.

710. Pionandra* *allophylla*, Miers, n. sp.; suffruticosa, glaberrima, dichotome ramosa, dicho-

* The genus *Cyphomandra* of Dr. Sendtner (*Pionandra*, Miers) comprises two distinct forms, which are characterized under the sectional names of *Ceratostemon* and *Euthystemon*, in Ill. So. Amer. Pl. vol. i. pp. 34, 41; in the former sometimes one, generally both, of the geminate leaves are cordate, the anther-cells are greatly arcuated and incurved, transversely verruculose, and partially burst by longitudinal slits, and the rounded glandiform apex opens by two lateral pores cleft lengthways; they are adnate to a broad fleshy gibbous connective, continuous with the short, broad, and fleshy filaments, which are suddenly geniculated and recurved in the middle, sometimes auriculated above, and are seated upon a free, annular, fleshy ring,

tomiis aphyllis floriferis, foliis petiolatis, 2–3–4-nis et integris, sæpe solitariis, et tunc trisectis, cum sinubus rotundatis, vel 3-foliolatis, folio intermedio majore quandoque 3-lobo, foliis foliolisque subdeltoideo-ovatis, imo in petiolum decurrentibus, apice repente lineari-acuminatis, marginibus haud undulato-sinuatis, ciliolatis, utrinque læte viridibus, rugoso-punctulatis, et glaberrimis, rachi nervisque tenuibus, stramineis, petiolo gracili vix alato; racemo glaberrimo, brevi, tenui, e dichotomio pendulo, sub-3-floro. In waste places about Panama.

Ramuli subfistulosi, pallide virides, creberrime albo-punctulati, in axillis flexuosi; petiolus glaber, tenuis, 1 ad 1¼ poll. long.; limbus (incluso lobo intermedio) 3–3½ poll. long.; acumine 6 lin., 1¾ poll. lat.; lobi laterales 2 poll. long., 1¼ poll. lat., nervis utrinque circiter 6, vix prominulis; pedunculus tenuis, e dichotomio nudo ortus (rarius ex axillis junioribus), 9 lin. long.; pedicellus 3 lin. long., imo articulatus. *Calyx* glaberrimus, turbinatus, dentibus ovatis, acutis, vix lineam longis, limbatis. *Corolla* glabra, flava, campanulata, 5 lin. longa, profunde 5-fida, laciniis lanceolatis, acutis, glabris, venosis, maculis opacis punctulatis, expansis, 3½ lin. longis. *Stamina* 5, æqualia, conniventia, limbo subbreviora. *Filamenta* brevia, imo dilatata, in annulum adnatum coalita. *Antheræ* 3 lin. longæ, lineares, apice breviter rostratæ, 2-lobæ, connectivo lato adnatæ, rima longitudinali utrinque, et poris 2 anticis sub apicem transversim dehiscentes. *Ovarium* glabrum, oblongum. *Stylus* longitudine staminum, subtenuis, cum ovario articulatus. *Stigma* parvulum, truncatum, subclavatum, cavum.

711. Capsicum *frutescens*, Linn., De Cand. Prodr. vol. xiii. p. 413.—Nomen vernacul. "Aji." Cultivated.

There are besides several other species of *Capsicum* cultivated in the Isthmus.

712. Physalis *pubescens*, Linn., var. *hygrophila*, Mart., De Cand. Prodr. vol. xiii. p. 446. Common on road-sides all over the country.

713. Physalis *angulata*, Linn., De Cand. Prod. vol. xiii. p. 448. Common on road-sides and in waste places.

arising from the base of the corolla; the style is articulated at its base, often very short and thick, and surmounted by a stigma, formed like an inverted cone, or sometimes almost umbraculiform, and nearly as large as the ovarium, exhibiting in its hollow truncated apex two large stigmatic glands; the fruit is generally large, fleshy, and edible. Analyses of different species are seen in Martius, Nov. Gen. Bras. iii. tab. 229; Sendtn. Flor. Bras. fasc. vi. tab. 15, 16; Miers, Ill. So. Am. Pl. i. pl. 8. In the second group the leaves are more or less cuneate at the base; the corolla is less fleshy; the segments more lanceolate; the filaments are straighter, more erect, dilated at base, and united upon a membranaceous ring, which is completely adnate to the base of the corolla; the anthers are long, slender, erect, attenuately rostrated above, with a clavate apex, and burst by two lateral slits, and by two anterior transverse pores, which in opening form a lower somewhat prominent lip beneath the hood of the club-shaped termination of the cells; the connective is shorter, narrower, and continuous with the filaments; the style is slender and terete; the stigma smaller, obconical, truncated, and hollow; the fruit does not appear to grow to the same large size as in the former section, and probably is not edible. Analyses of plants of this group are seen in Martius, Nov. Gen. Bras. iii. tab. 228; Sendtn. Flor. Bras. fasc. vi. tab. 17; and Miers, Ill. So. Am. Pl. i. plate 9.

It is proposed to retain the name of *Cyphomandra* for the first section, comprising *C. calycina, physaloides, sycocarpa, lobata, diploconos, floribunda, ciliata, fragrans, sciadostylis, premnæfolia, brachypodia, obliqua, betacea, ovum-fringillæ, pendula, corymbiflora, splendens*, and *viridiflora;* and to restore the name *Pionandra* for the second group, as a separate genus, which will comprise *P. capsicoides, divaricata, Tegore, Hartweggii, coriacea, cajanumensis*, Miers, *C. oxyphylla, laxiflora*, Dun., *C. velutina, elliptica, cylindrica, fraxinella*, Sendt., *C. Caracasana*, Dun., *P. allophylla* above-mentioned, and another Brazilian species with pinnated leaves, which will shortly be described elsewhere.

714. Cestrum *macrophyllum*, Vent., De Cand. Prodr. vol. xiii. p. 627. Volcano of Chiriqui, Veraguas.

This plant is probably referable to this species; it is however similar to No. 1268 of Cuming's collection from Peru, and No. 336 of Hostmann's from Surinam.

715. Cestrum *latifolium*, Lam., De Cand. Prodr. vol. xiii. p. 636. Dark forests near Cruces, Province of Panama.

716. Cestrum *viridiflorum*, Hook., De Cand. Prodr. vol. xiii. p. 663. Volcano of Chiriqui, Veraguas.

717. Cestrum *scandens*, Dun. in De Cand. Prodr. vol. xiii. p. 664.—Nomen vernacul. "Dama de noche." Panama and Darien.

ATROPACEÆ.

(*Auctore J. Miers.*)

718. Juanulloa *Panamensis*, Miers, Ill. So. Am. Pl. vol. ii. p. 41. pl. 46.—De Cand. Prodr. vol. xiii. p. 530. Woods near the village of Tole, Veraguas, growing epiphytically on trees.

SCROPHULARINEÆ*.

719. Browallia *nervosa*, Miers, in Ann. Nat. Hist. 2. Ser. v. 206.—Ill. So. Am. Pl. vol. ii. 66. In waste places about Panama.

720. Russelia *sarmentosa*, Jacq., De Cand. Prodr. vol. x. p. 332. In savanas, common in Panama and Veraguas.

721. Stemodia *parviflora*, Ait., De Cand. Prodr. vol. x. p. 382. In swamps near the city of Panama.

722. Stemodia *durantifolia*, Swartz, De Cand. Prodr. vol. x. p. 383.—Var.? *subspicata*, Benth. MSS.; floribus subspicatis. Cruces, Province of Panama.

723. Herpestis *chamædroides*, H. B. et K., De Cand. Prodr. vol. x. p. 393. Swamps near Panama.

724. Herpestis *Ranaria*, Benth., De Cand. Prodr. vol. x. p. 395.—Var. *Panamensis*, Seem.; erectior, apice paniculato-ramoso.—*H. thymoides*, Mart. MSS.! Swamps near Panama.

"I have both varieties of this species," writes Mr. Bentham, "from Brazil."

725. Herpestis *laxiflora*, Benth., De Cand. Prodr. vol. x. p. 396. In swamps near the city of Panama.

726. Herpestis *Salzmanni*, Benth., De Cand. Prodr. vol. x. p. 397. Hacienda de Juan Lanas, Province of Panama.

727. Vandellia *diffusa*, Linn., De Cand. Prodr. vol. x. p. 416. About Panama.

728. Hydranthelium *callitrichoides*, H. B. et K., De Cand. Prodr. vol. x. p. 425. Swamps near Santiago de Veraguas.

* In determining the plants of this Order, I have been kindly assisted by George Bentham, Esq.

729. Capraria *biflora*, Linn., De Cand. Prodr. vol. x. p. 429. In waste places, common all over the Isthmus.

730. Scoparia *dulcis*, Linn., De Cand. Prodr. vol. x. p. 431.—Nomen vernacul. "Escobillo amargo." In waste places, common all over the Isthmus; Chagres (Fendl. no. 5).

731. Buddleia *Americana*, Linn., De Cand. Prodr. vol. x. p. 438. Slopes of the lower parts of the Volcano of Chiriqui, Veraguas.

732. Buchnera *lithospermoides*, Kunth, De Cand. Prodr. vol. x. p. 497. Cerro de Ancon, Panama.

733. Buchnera *elongata*, Swartz, De Cand. Prodr. vol. x. p. 498.—Var. *hispida*, Benth. MSS. Cerro de Ancon, Panama.

734. Buchnera *rosea*, H. B. et K., De Cand. Prodr. vol. x. p. 498. Island of Taboga, Bay of Panama (Hinds).

735. Castilleja *communis*, Benth., De Cand. Prodr. vol. x. p. 529. On road-sides, from Panama to David, but scarce.

736. Lamourouxia (Hemispadon) *scabra*, Benth. MSS. (Tab. XXXIII.); pubescenti-hispida, superne viridula, foliis subsessilibus anguste ovatis basi angustatis dentatis margine revolutis venoso-rugosis rigidis scabris, calycis breviter campanulati dentibus tubo suo 2–3-plo brevioribus, corolla vix ventricosa profunde fissa, filamentis posticis apice glabris anantheris.—Affinis *L. viscosæ* et *L. cordatæ*; facillime distinguitur foliis parvis fere in petiolum angustatis, et calycis forma. Volcano of Chiriqui, Veraguas.

A shrub from 3–5 feet high; leaves from 6 to 10 lines long, and about 2 lines broad; corolla 1½ inch long, bright scarlet, rendering the plant highly ornamental, and worthy of cultivation in a garden; capsule glabrous, shining.

Plate XXXIII. Fig. 1, corolla cut open; 2, 3, anthers; 4, ovary and style; 5, ovary cut open; 6, calyx and ripe capsule; 7, an entire seed; 8, a seed cut open; 9, albumen and embryo; 10, embryo:—*all magnified.*

LENTIBULARIEÆ.

737. Utricularia *pusilla*, Vahl, De Cand. Prodr. vol. viii. p. 16. In swamps near the city of Panama.

738. Utricularia *montana*, Jacq., De Cand. Prodr. vol. viii. p. 23. In southern Darien and the Bay of Choco, growing epiphytically on old trees, in company with Mosses, Ferns, and *Piperaceæ*.

This ornamental plant was collected in Dominica (Imray), St. Vincent (Guilding), Trinidad, 2800 feet above the sea (Parker), and Guiana (Parker).

ACANTHACEÆ.

739. Elytraria *apargiifolia*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 65. In stony places, Cerro de Ancon, near Panama.

740. Nelsonia *canescens,* Nees ab Esenb.—Var. *a,* De Cand. Prodr. vol. xi. p. 67. On roadsides, near the village of Cruces, Province of Panama.

741. Hygrophila *costata,* Nees ab Esenb.—Var. *angustifolia,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 88. On the banks of rivers, Province of Panama.

742. Dipteracanthus *tubiflorus,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 128.—*D. leucanthus,* N. ab Esenb. in Benth. Pl. Hartw. p. 236. no. 1268? In dark woods near the village of San Lorenzo, Province of Veraguas.

A half-shrubby plant, from 1 to 3 feet high; calyx varying considerably in size, according to the age of the plant, rendering it probable that *D. tubiflorus* and *D. leucanthus* are specifically identical; corolla white.

743. Dipteracanthus *humilis,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 139. In sunny places near Panama.

744. Dipteracanthus *Hænkei,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 141. In shady places, common from Panama to Santiago de Veraguas.

745. Trichanthera *gigantea,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 218. Between Cruces and Araijan, Province of Panama.

This tree has been found, besides the localities mentioned in De Cand. Prodromus and above, in Ocaña (Schlim, no. 135), and Demerara (Rich. Schomburgk).

746. Barleria *micans,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 223. In woods between Cruces and Araijan, Province of Panama.

747. Teliostachya *alopecuroidea,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 263. Chagres, Province of Panama (Fendl. no. 225).

748. Aphelandra *tetragona,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 295. Woods of Southern Darien.

749. Aphelandra *Hartwegiana,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 296. Woods of Piñas Bay, Darien.

750. Aphelandra *Sinclairiana,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 296. Woods near the village of San Juan; Chagres (Fendl. no. 209).

751. Aphelandra *pectinata,* Willd., De Cand. Prodr. vol. xi. p. 297. In savanas; common in the Provinces of Panama and Veraguas.

752. Thyrsacanthus *bracteolatus,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 325. Dark woods of Darien.

753. Jacobinia *ciliata,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 333. Santiago de Veraguas, and banks of the river Pequeni.

754. Rhytiglossa *secunda,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 340. Village of San Juan; Chagres (Fendl. no. 228).

755. Rhytiglossa *pectoralis*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 352. On walls, rocks, and in stony places; common all over the country.

The var. β of this species was found by me at Boquete, volcano of Chiriqui.

756. Leptostachya *comata*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 381. In swamps near Panama.

757. Adhatoda *Carthagenensis*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 403. Banks of the river Pequeni, Province of Panama.

758. Eranthenium *cordatum*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 450. Woods near the village of San Lorenzo, growing in company of *Dipteracanthus tubiflorus*.

A half-shrubby plant, 2–4 feet high; corolla white, with a rosy tinge.

759. Blechum *Linnæi*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 465. Common in waste places; all over the Isthmus.

760. Blechum *Brownei*, Juss., De Cand. Prodr. vol. xi. p. 466. Portobelo (Billberg), and banks of the river Pequeni, Province of Panama.

SESAMEÆ.

761. Sesamum *Indicum*, De Cand. Prodr. vol. ix. p. 250. Hacienda de Cocoli, Province of Panama.

BIGNONIACEÆ.

762. Bignonia (§ Conjugatæ) *lepidota*, Seem.; ferrugineo-lepidota, demum glabra, ramis scandentibus teretiusculis, foliis simplicibus conjugatis et cirrhosis, foliolis ovatis acuminatis integerrimis subtriplinerviis, racemis axillaribus oppositis 6–8-floris, calyce coriáceo subbilabiato, corolla glabra (purpurea), filamentis glabris, ovario elongato, lamellis acutis, capsula . . . Island of Iguana; Panama (Cuming, no. 1262 *ex parte*); also collected about Veracruz by both Linden and Galeotti.

763. Bignonia *difficilis*, Cham., De Cand. Prodr. vol. ix. p. 150. Panama.

764. Bignonia *Prieurei*, De Cand. Prodr. vol. ix. p. 154. Village of Remedios, Veraguas.

The cirrhi are, as in many other *Bignoniaceæ*, often wanting; but at the base of the petiole are now and then additional leaflets, which almost look like stipules. The corolla is yellow, and has inside purple stripes.

765. Bignonia *æquinoctialis*, Linn., De Cand. Prodr. vol. ix. p. 155. Island of Coyba, coast of Veraguas.

The flowers of the specimens collected by me are red with yellow stripes.

766. Bignonia *Sinclairi*, Benth., Bot. Sulph. p. 129. Cruces, Province of Panama.

A beautiful species, with flowers of a deep rose-colour.

767. Bignonia *dentata*, De Cand. Prodr. vol. ix. p. 162. Village of Gorgona, Province of Panama.

A climbing shrub; leaves either trifoliolated, or conjugated and furnished with cirrhi. The leaflets are not always toothed; in one and the same specimen they are quite entire and dentated; the panicles are sometimes axillary, as well as terminal, and the tomentum is more or less dense.

768. Lundia *Chica,* Seem.; glabra vel plus minus puberula, demum glabrata, foliis inferioribus trifoliolatis (vel pinnatis?) superioribus conjugatis, petiolo sæpe in cirrhum simplicem producto, foliolis ovato-oblongis acuminatis, paniculis axillaribus vel terminalibus, calyce nunc 5-dentato nunc truncato vel lateraliter fisso, corolla pubescente, capsula siliquæformi elongata lævi.—*Bignonia? Chica,* Humb. et Bonpl. Plant. Æq. vol. i. p. 107. t. 31 !—*Bignonia cuprea,* Cham. in Linnæa, 1832, p. 665 !—Nomen vernacul. "Hojita de teñir." Near the village of Remedios, Veraguas.

The flowers and habit of this plant agree well with the character of *Lundia,* as laid down by De Candolle, and I have therefore removed it from *Bignonia,* a genus to which it had been referred with a doubt. The leaves contain a purple colouring matter, which is used by the inhabitants of Veraguas for dyeing hammocks. Another species of *Lundia* with trifoliolated leaves, probably new, was collected at Chagres by Fendler (no. 206).

769. Macfadyena *uncinata,* De Cand. Prodr. vol. ix. p. 180. Chagres (Fendler, no. 207).

A shrub; the leaflets are often long acuminate.

770. Arrabidæa *subincana,* De Cand. Prodr. vol. ix. p. 184. Santiago de Veraguas, Panama.

771. Anemopægma *orbiculatum,* De Cand. Prodr. vol. ix. p. 190.—*Pithecoctenium Panamense,* Benth. in Bot. Sulph. p. 129 !—Nomen vernacul. "Campanita." Panama; Cruces; Cupica, Darien.

The ovary is covered with small dots, which give it the appearance of that of *Pithecoctenium;* but the fruit is quite smooth and viscous.

772. Amphilophium *paniculatum,* H. B. K., De Cand. Prodr. vol. ix. p. 193. Island of Flaminco and Rio de Santamaria.

The flowers emit a beautiful fragrance.

773. Tecoma *pentaphylla,* Juss., De Cand. Prodr. vol. ix. p. 217.—Nomen vernacul. "Roble." Natá, Province of Panama.

This tree produces most durable timber; hence its native name, Roble, *i. e.* Oak.

774. Tecoma *Guayacan,* Seem.; arborea, ligno durissimo, ramis crassis subtetragonis, foliis digitatis junioribus pedunculis calycibusque pube rufa stellata vestitis demum glabris, foliolis 5–7 ovato-lanceolatis utrinque acuminatis integerrimis, floribus terminalibus trichotomo-corymbosis, calyce campanulato irregulariter 5-fido vel subbilabiato, corolla (flava) extus glabra intus barbata, stylo ovarioque glabris, capsula . . .—Nomen vernacul. "Guayacan." Cruces and Gorgona, Province of Panama.

This tree is highly esteemed on account of its hard and durable timber. In the ruins of the Cathedral of Panama Viejo are beams of its wood, which have been exposed to the influence of the climate since the destruction of the city in 1671, and are still sound. The *Guayacan* is common about Cruces and Gorgona; and in the middle of the dry season (March), when in full blossom, it affords a beautiful spectacle. The leaves are deciduous, and, as in several other species of *Tecoma,* appear after the flowers.

775. Tecoma *stans,* Juss., De Cand. Prodr. vol. ix. p. 224.—Nomen. vernacul. "Copete."

Common about the city of Panama and the adjacent islands; frequently establishing itself on old walls, and on the roofs of houses and churches.

776. JACARANDA *filicifolia*, Don, De Cand. Prodr. vol. ix. p. 229.—Nomen vernacul. "Palo de bubo." From David to San Lorenzo, Veraguas, mostly on the banks of rivers.

This tree, as its popular name indicates, is used against yaws and similar cutaneous eruptions. It is one of the most beautiful the country can boast of, and about 50 feet high: the flowers are blue with a purplish tinge, and numerous; the wood is white, and very light.

777. TOURRETIA *lappacea*, Willd., De Cand. Prodr. vol. ix. p. 236. Volcano of Chiriqui, Veraguas.

This plant has been also found in Peru (Lobb, M'Lean, and Mathews), Tolima, New Granada (Purdie), Merida (Moritz), and Mexico (Hartweg). The flowers resemble those of *Castilleja vulgaris*.

CRESCENTIACEÆ.

Few groups of plants have been a greater puzzle to botanists than that of *Crescentiaceæ*. *Crescentiaceæ* were associated by Jussieu with *Solaneæ*, by Endlicher with *Gesneriaceæ*, and by De Candolle with *Bignoniaceæ*. Gardner has the credit of having been the first who pointed out (Hook. Journ. vol. ii. p. 424) their claims to be regarded as a separate Natural Order, closely allied to *Bignoniaceæ*. Lindley, adopting this view, gave, in the first edition of his 'Vegetable Kingdom,' p. 673, a diagnosis of the New Order. That diagnosis, however, had one great fault: it was entirely drawn up from one member of that family, viz. *Crescentia Cujeta*, L. (*C. cuneifolia*, Gardn.!), and does therefore not comprise the chief feature of the whole Order. For instance, it assigns to all *Crescentiaceæ* simple leaves, and a hard-shelled or woody fruit,—characters which combined are only found in one species of *Crescentia*. It is with the view of remedying this evil, that I have been induced to draw up the following brief diagnosis, the merits of which may best be tested by comparing it with the plants composing the Order.

CRESCENTIACEÆ.—*Frutices* vel *arbores* glabræ vel glabratæ, caule ramisque plus minusve angulatis. *Folia* alterna, fasciculata vel opposita, petiolata vel subsessilia, nunc simplicia, sæpissime integerrima, nunc composita, trifoliolata vel pari- v. impari-pinnata. *Stipulæ* nullæ, vel interdum e gemmæ axillaris foliis primariis spuriæ. *Flores* hermaphroditi, subregulares vel irregulares, terminales vel axillares, vel sæpissime ex trunco aut basi ramulorum orti. *Calyx* liber, gamophyllus, persistens, 5-merus vel rarius deciduus, spathaceus vel bipartitus. *Corolla* hypogyna, gamopetala, subcampanulata, infundibuliformis vel hypocraterimorpha, limbo 5-lobo, subæquali vel subbilabiato, lobis per æstivationem duplicato-plicatis vel subplicato-imbricatis. *Stamina* 4, cum rudimento quinti, corollæ tubo inserta, ejusdem laciniis alterna, exserta vel inclusa. *Filamenta* simplicia. *Antheræ* biloculares. *Discus* hypogynus glandulosus, ovarii basin cingens, sæpe obsoletus. *Ovarium* liberum, 1-loculare; *ovula* indefinita. *Stylus* terminalis, simplex. *Stigma* bilobum vel bilamellatum. *Fructus* baccatus, 1- 2- vel rarius 4- vel pluri-locularis. *Semina* plurima, aptera. *Albumen* nullum. *Embryo* rectus vel subcurvatus.

The *Crescentiaceæ* inhabit chiefly tropical and subtropical regions of America and Africa. They are excluded from Europe and Australia; and only one species is found in Asia. Several Crescentias are cultivated, and have become naturalized in different parts of the Old World. No *Crescentiaceæ* possess any poisonous qualities, but their properties on the whole are not yet understood. The Order, as far as it is at present known, is composed of about thirty species, distributed under nine Genera.

In endeavouring to find out characters for a sectional subdivision of the Order *Crescentiaceæ*, my attention was drawn to an interesting paper in the 21st volume of the 'Linnean Transactions' (p. 141), in which Mr. Miers describes *Oxycladus*, a new genus of plants, which he associates with *Bignoniaceæ*, an Order which, according to the views of that author, comprises both the true *Bignoniaceæ* and the *Crescentiaceæ*. The structure of *Oxycladus*, however, is so entirely different from all other genera of *Bignoniaceæ*, that Mr. Miers was obliged to make a new division of that Natural Order, called *Oxycladeæ*. I should have been glad to adopt that learned botanist's views, had they not so widely differed from those I hold on the same subject. It was in order to bring our mutual views into harmony with each other that I began to make a critical investigation of the paper alluded to, the result of which was that I felt convinced Mr. Miers's third division of *Bignoniaceæ*, viz. the tribe *Oxycladeæ*, was not tenable, because the genus *Oxycladus*, Miers, has nothing to do with *Bignoniaceæ*, even in the widest sense, but belongs, I think, to *Myoporaceæ*.

I have therefore made an attempt to distribute the true *Crescentiaceæ* into *two* sectional subdivisions: the first tribe, for which I adopt the name *Tanæcieæ*, includes all those genera with a persistent, regular, five-cleft calyx (viz. *Colea*, *Pariblema*, *Phyllarthron*, *Tanæcium*, and *Tripinnaria*). The second tribe, called by me *Crescentieæ*, comprises those genera which have a deciduous, irregular, spathaceous, or biparted calyx (viz. *Parmentiera*, *Crescentia*, *Kigelia*, and perhaps *Sotor*).

I may add, that all the plants belonging to the Order *Crescentiaceæ* have a tendency to form winged petioles; and it is by no means unlikely that the simple-leaved *Crescentieæ* will in future be looked upon as plants with abortive leaflets and highly developed petioles (*phyllodia*). I may also remark, that all *Crescentiaceæ* have a parietal placentation, and a truly unilocular fruit, as an examination of the ovary will show; but that, when the placentæ meet, as they generally do when the fruit approaches maturity, the placentation appears to be axile, and the fruit bi- or quadri-locular.

Tribus I. Tanæcieæ, *Seem.*

Calyx persistens, regularis, 5-merus.

778. Tanæcium *lilacinum*, Seem.—*Schlegelia lilacina*, Miq., De Cand. Prodr. vol. ix. p. 564. Cupica, Darien.

There is no generic distinction between *Schlegelia* and *Tanæcium*; the berry is black, about a quarter of an inch long, and has a sweet taste.

Tribus II. Crescentieæ, *Seem.*

Calyx deciduus, irregularis, spathaceus vel bipartitus.

779. Parmentiera *cereifera*, Seem. (Tab. XXXII.); inermis, foliis sparsis, petiolis alatis, foliolis membranaceis obovato-oblongis acuminatis, corolla alba, fructu cylindrico ecostato bisulcato glaberrimo, seminibus subcordatis.—Nomen vernacul. "Palo de velas." Near the villages of Gorgona, Cruces, and San Juan, Province of Panama.

The tree is confined to the valley of the river Chagres, where it forms entire forests. In entering them a person might almost fancy himself transported into a chandler's shop. From all the stems and lower branches of the trees hang long cylindrical fruits, of a yellow wax-colour, so much resembling a candle as to have given rise to the popular appellation, Palo de velas (Candle-tree). The fruit is generally from two to three, but not unfrequently four, feet long, and about an inch in diameter. The tree itself is about twenty feet high, and has opposite trifoliolated leaves, and large white blossoms, which appear throughout the year, but are in greatest abundance during the rainy season. Hitherto only one species of *Parmentiera*, *P. edulis*, De Cand., was known to exist. The fruit of the latter, called Quauhxilotl, is eaten by the Mexicans, while that of the *P. cereifera* serves for food to numerous herds of cattle. Bullocks especially, if fed with the

fruit of this tree, Guinea Grass (*Panicum jumentorum*, Pers.), and Batatilla (*Ipomœa variabilis*, Chois.), soon get fat. It is admitted however that the meat partakes in some degree of the peculiar apple-like smell of the fruit; but this flavour is by no means disagreeable, and easily removed, if, for a few days previous to the killing of the animal, its food is changed. The tree produces its principal harvest during the dry season, when all the herbaceous vegetation is burnt up, and on that account its cultivation in tropical countries is especially to be recommended; a few acres of it would effectually prevent that want of fodder which is always most severely felt after the periodical rains have ceased.

Plate XXXII. Fig. 1, part of corolla and filaments; 2, stamen, *magnified;* 3, ovary and style, *magnified;* 4, lower end of the fruit:—from a rough sketch taken on the spot.

The genus *Parmentiera* is composed of three species, *P. edulis*, De Cand., *P. aculeata*, Seem., both natives of Mexico, and *P. cereifera*, Seem.; they are middle-sized trees. The leaflets of the young plants are serrated, those of the old ones quite entire. The flowers are green or white, and, like those of most *Crescentiaceæ*, grow out of the old wood. The fruit is cylindrical and fleshy, and the seeds not larger than lentils. The *P. aculeata*, Seem., is founded on a specimen in Hooker's Herbarium. It was collected by Schiede (No. 1207), and distributed under the name of *Crescentia aculeata*.

780. Crescentia *Cujeta*, Linn., De Cand. Prodr. vol. ix. p. 246.—*C. cuneifolia*, Gardn. in Hook. Journ. of Bot. vol. ii. p. 422 !—Nomina vernacul. "Palo de turtumas" et "Calabazo." Common in every part of the Isthmus, in sunny places; frequently cultivated.

Plants which, like the Calabash-tree, have been cultivated from time immemorial, are apt to vary, and we can hardly give too much latitude to such species. I can find no specific distinction between *C. Cujeta*, Linn., and *C. cuneifolia*, Gardn., and have therefore united them. The characters assigned to each are not constant; on one and the same tree specimens of both the so-called species may be found. The chief points which distinguish *C. Cujeta* from its allies are its arboreous habit, its fasciculate leaves, and its woody fruit. The latter has such a hard shell that only an axe can break it, while that of *C. cucurbitina* is almost as easily crushed as an egg. In domestic economy the Calabash-tree is very useful. The hard shells of its fruit are turned into bottles, sieves, spoons, and various other household articles. By incision of the unripe fruit a sap collects, which is used by the people of the Isthmus as a purgative; I also found that the sap dyes silk black.

781. Crescentia *cucurbitina*, Linn., De Cand. Prodr. vol. ix. p. 246.—*C. obovata*, Benth. in Bot. Sulph. p. 130. f. 46 !—*C. palustris*, Forsyth, Herb. !—Nomen vernacul. "Calabazo de playa." On the sea-shores both of the Atlantic and Pacific Oceans.

A common sea-side shrub, from 12 to 16 feet high, diffused over the West Indies, the central parts of continental America, and some of the islands in the Pacific. I have seen specimens from Jamaica (Purdie, Distin), St. Vincent (Anderson), Chagres (Fendler, No. 210), Island of Gorgona (Barclay). The shape of the leaves is very variable; the fruit is sometimes roundish, sometimes egg-shaped or elliptical. Bentham's *C. obovata* is in no way distinct from *C. cucurbitina*, and I have reason to suppose, though want of materials prevents me from finally settling the point, that *C. acuminata*, H. B. K., is also a mere synonym of *C. cucurbitina*.

782. Crescentia *alata*, H. B. K., De Cand. Prodr. vol. ix. p. 247. David, Veraguas; cultivated, and introduced from Mexico.

This tree is about 30 feet high, and called in Western Mexico "Tecomate." Its fruit resembles in shape and colour an unripe orange, and contains a pulp of a sourish-bitter taste, which is boiled with sugar in its native country, and taken against complaints of the chest.

All *Crescentiæ*, I am of opinion, are naturally littoral plants; for, although they are not so closely con-

fined to the sea-coast as the *Rhizophoras*, yet they are, like many other maritime plants, the *Cocos nucifera* and *Hibiscus tiliaceus* for instance, capable of growing inland when under cultivation, but they do not spontaneously extend their range beyond the limit of the sea-breeze.

GESNERIACEÆ*.

783. Gesneria *spicata*, H. B. et K., De Cand. Prodr. vol. vii. p. 531.—*G. Seemanni*, Hook. Bot. Mag. t. 4504! Upon rocks, Western Coast of Darien.

This species loses much of the density of its hairy covering when in cultivation, and assumes altogether so different an aspect, that Sir William J. Hooker looked upon the plant raised from rhizomes sent by me to the Royal Botanic Gardens at Kew (which he did me the honour of naming after me), as a species distinct from *G. spicata*.

784. Gesneria *petiolaris*, Benth. Bot. Sulph. p. 131. Coyba Island, off the Southern Coast of Veraguas (Barclay, Hinds).

785. Gesneria *tubiflora*, Cav., De Cand. Prodr. vol. viii. p. 527.—*G. incurva*, Benth. Bot. Sulph. p. 131!—*G. picta*, Hook. Bot. Mag. t. 4431!—Nomen vernacul. "Guatatuco." Common in and about Panama, often growing on old walls, on the roofs of houses and steeples of churches; Island of Gorgona (Barclay).

I introduced this species into the Royal Botanic Gardens at Kew, and it is now to be met with in the hot-houses of most horticultural establishments both of England and the European Continent.

786. Gesneria *rhynchocarpa*, Benth. Bot. Sulph. p. 131.—Wlprs. Rep. vol. vi. p. 398. Bay of Piñas, Darien.

This species was also collected at Santamarta by Mr. William Purdie, where, according to a memorandum of that traveller in Herb. Hook., the inhabitants make a decoction of it, which is administered with good effect in cases of dysentery.

787. Gloxinia (§ Salisia) *pallidiflora*, Hook. Bot. Mag. t. 4213.—Wlprs. Rep. vol. vi. p. 401. In savanas near the village of San Juan, Province of Panama; rare.

This species is intimately connected with *Gloxinia maculata*, L'Hérit., the type upon which *Gloxinia* was founded; for that reason I cannot agree with Mr. Regel in changing the *Gloxinia maculata*, L'Hérit., into *Salisia gloxiniæflora*. If the limits of the genus, as adopted by De Candolle (Prodr. vol. vii. p. 533), have to be circumscribed on account of some of the species possessing a perigynous cup and some hypogynous glands, and new genera have to be made, the name *Gloxinia* must be retained for that species upon which the genus was originally founded (*G. maculata*, L'Hérit.); nor is it in accordance with the rules of botanical science to give, as Mr. Regel has done in this case, a new specific name to plants when their generic one is changed, unless the specific name was previously occupied in the genus to which the plant is referred.

Scheeria, Seem. — Char. Gen. *Calyx* tubo ecostato cum ovario connato, limbo supero 5-partito æquali. *Corolla* perigyna, campanulata, subringens, tubo supra ad basin gibbo, fauce ampliato,

* While this sheet is going through the press, I have received the valuable paper on *Gesneriaceæ* by Dr. J. Hanstein, unfortunately too late for adopting the new and highly satisfactory arrangement therein proposed.

limbo 5-partito. *Stamina* corollæ tubo inserta, 4, didynama, inclusa, cum rudimento quinti; *antheræ* biloculares, sub anthesin cohærentes. *Ovarium* basi calyce cohærens, disco annulari subintegro cinctum, uniloculare. *Ovula* plurima. *Stylus* simplex; *stigma* stomatomorphum. *Capsula* uniocularis, bivalvis, valvis medio placentiferis.—Herbæ *Americæ tropicæ, hirsutæ,* stolonibus *squamoso-amentaceis perennantibus,* caulibus *erectis,* foliis *oppositis petiolatis ovatis acuminatis serratis,* floribus *axillaribus solitariis vel geminis,* corollis *amplis purpureis, cæruleis vel albidis.*—Seem. in Bot. Mag. tab. 4743 !—Regel, Gartenflora, Jahrg. ii. p. 355. cum icon. !—Gard. in Hook. Icon. Plant. t. 472 !

The genus *Scheeria* was named in compliment to Frederick Scheer, Esq., to whom European gardens are indebted for the introduction of *Scheeria Mexicana* and several other ornamental plants, and to whose successful study of *Cactaceæ* science owes many interesting additions. The genus is closely allied to *Gloxinia* (§ *Salisia*, Regel) and *Achimenes;* from the former—considering *Gloxinia maculata*, L'Hérit., as its type—it differs in having the spur (gibba) on the upper side of the corolla more developed, and no inflation on the under side; from the latter it is easily distinguished by its stomatomorphous, not bilobed, stigma. In habit it resembles the genus *Locheria*, Regel, which includes the *Achimenes hirsuta*, *A. pedunculata*, and *A. multiflora* of botanists. At present there are two species of *Scheeria* known, viz. *S. Mexicana*, Seem. (*Achimenes Scheerii*, Hort. Germ., *A. Chirita*, Van Houtte), and *S. ichthyostoma*, Seem. (*Gloxinia ichthyostoma*, Gard. in Hook. Icon. Plant. t. 472). With some doubt I add here a third species, described from specimens in an imperfect state of preservation, but agreeing, as far as they go, better with *Scheeria* than any other genus with which I am acquainted, or with any other *Gesneriacea* contained in the rich Herbaria of Hooker and Bentham.

788. Scheeria? *Panamensis,* Seem.; hirsuta, caule adscendente basi radicante, foliis ovatis acuminatis serratis, pedunculis axillaribus solitariis vel geminis, calycis lobis ovato-lanceolatis acuminatis hinc inde denticulatis tubo corollæ 4-plo brevioribus, corolla subhirsuta (alba), staminibus inclusis, ovario villoso, capsula subrotunda, seminibus ovatis acutis nigris. Woods near the village of Gorgona, Province of Panama.

A herb about 10 inches high; leaves opposite, from 3 to 4 inches long (including petiole), and in the middle about 2 inches broad.

I should call this plant an annual, having carefully dug for the rhizome, and not been able to find it; however, it has been frequently observed that *Gesneriaceæ*, which were annuals when growing wild, have proved perennials when under cultivation. As a rhizome cannot solely be the effect of cultivation, but can only have become more developed by artificial treatment, I venture to doubt whether any *Gesneriaceæ* are annual, and assume that they are either perennial herbs or shrubs. It is likely that those *Gesneriaceæ* springing up from seeds, and growing rapidly under the influence of rich soil and excessive moisture and heat, run so much into leaf that their rhizomes are too small and weak to survive the dry season which must necessarily elapse before they are called again into operation. This seems to be especially the case with those plants growing in dark virgin forests; those flourishing in exposed situations, and on rocks, walls, etc., as, for instance, the *Gesneria spicata, G. incurva* and *rhynchocarpa* of the Panamian Flora, have always comparatively large and numerous rhizomes.

789. Kollikeria *argyrostigma,* Regel, Wlprs. Ann. vol. ii. p. 1069.—*Achimenes argyrostigma,* Hook. Bot. Mag. t. 4175 ! Hills about Santiago de Veraguas.

Achimenes ocellata, Hook., was stated in the 'Botanical Magazine' (sub tab. 4359) to have been sent by me from the Isthmus of Panama; but that was a mistake, probably caused by an accidental misplacing of the labels in the Royal Botanic Gardens at Kew; it is a native of some other part of New Granada, the Andes of Quindiu, and was discovered in that locality and introduced into Europe by Mr.

.Purdie. I may also mention that *Achimenes Hillii*, Hort., which has been raised to the dignity of a species by Regel, and also received a new generic name from that author (*Tydæa Hillii*, Regel, Gartenflora, Jahrg. iii. p. 73), is a hybrid, produced in the Royal Botanic Gardens at Kew by Mr. Walter Hill, by crossing of *Achimenes picta*, Benth., and *Gesneria Hondensis*, H. B. K.

790. Columnea *bilabiata*, Seem.; caule suffruticoso carnoso radicante hirsuto demum glabro, foliis oppositis breviter petiolatis lanceolatis acutis integerrimis utrinque concoloribus supra glabris subtus petiolis cauleque albido-hirsutis vel imo villosis demum glabris, floribus axillaribus solitariis, pedunculis albido-villosis, calycis lobis ovatis longe acuminatis basi inciso-fissis extus præcipue ad nervos albido-villosis intus glabris, corolla (coccinea) bilabiata lobis integerrimis extus hirsuta intus glabra, staminibus inclusis, filamentis basi vix connatis glabris, ovario apice villoso, stylo glabro, bacca . . . Cape Corrientes, Darien.

An epiphytical shrub; leaves, including petiole, from 3 to 4 inches long, and about 6 lines broad; peduncles longer than the petioles; lobes of the calyx half as long as the corolla; corolla about $1\frac{1}{2}$ inch long; glands about 5. This species, differing from all other *Columneas* by its peculiarly-shaped corolla, the lower lip of which is quite entire, forms a new section of the genus to which it belongs, or may be looked upon as the type of a new genus.

791. Columnea (§ Veræ, *Benth.*) *flaccida*, Seem.; caule fruticoso, ramis elongatis flaccidis demum glabris, foliis oppositis ovato-lanceolatis acutis denticulatis plus minusve hirsutis demum glabris, floribus axillaribus solitariis, pedunculis calycibusque villosis, cal. lobis lanceolato-linearibus basi inciso-fissis, corolla (coccinea) limbi lobis acutis extus hirsuta intus glabra, staminibus galeam æquantibus, filamentis basi in tubum postice fissum coalitis, ovario villoso, stylo stigmateque pubescentibus, bacca . . . Woods near Gualaca, Province of Veraguas.

An epiphytical shrub, flowering after the leaves have fallen off; leaves too imperfect in my specimens to admit of determining their normal length; corolla three inches long, bright scarlet; ovary surrounded by glands.

792. Drymonia *delphinioides*, Seem.; fruticosa, erecta, caule petiolis pedunculisque pubescenti-villosis, foliis breviter petiolatis obovato-oblongis acuminatis basi attenuatis dentatis supra glabris subtus pubescenti-villosis, pedunculis axillaribus solitariis folio paullo brevioribus, sepalis dimidiato cordato-ovatis acutis dentatis corollaque pubescentibus, corolla basi longe calcarata, calcare curvato acuto calyce subæquante, limbo subdenticulato. In dark forests, Cape Corrientes, Darien.

An erect shrub, about 2 feet high, with a simple or forked stem; leaves, including petiole, from 4 to 5 inches long, and in the middle about $1\frac{1}{2}$ inch broad; corolla pale blue, about 2 inches long, and differing from those of all other species of this genus by the length of its spur, which is curved downwards. An allied species is *D. antirrhina*, Seem. (*Gloxinia antirrhina*, De Cand. Prodr. vol. vii. p. 534!).

793. Alloplectus *lanatus*, Seem.; fruticosa, erecta, caule hirsuto, foliis cujusve paris valde inæqualibus, altero obovato-oblongo basi inæquali, apice acuminato integerrimo vel hinc inde dentato, supra glabro, subtus ad nervos adpresse villosis, altero 10–12-ies minore ovato longe acuminato, floribus axillaribus breviter pedunculatis bracteatis, bracteis amplis cordatis acuminatis extus hirsutis intus glabris, sepalis foliaceis ovato-lanceolatis extus hirsutis intus glabris, corolla calycem duplo superante tubulosa 5-dentata lobis acutiusculis extus dense lanata intus glabriuscula, staminibus inclusis, stigmate bilobo villosiusculo. Cape Corrientes, Darien.

A shrub about 3 feet high, closely allied to *Alloplectus? dimidiatus*, Benth., but much more hairy, and with quite entire lobes of the calyx. The larger leaves, including petiole, from 10 to 12 inches long,

and in the middle from 4 to 5 inches broad, and, like several allied species, with blood-red spots; smaller leaves not exceeding 1 inch in length; corollas about 14 lines long.

794. Alloplectus *Darienensis*, Seem.; caule suffruticoso scandente radicante glabro, foliis ovato-lanceolatis longe petiolatis in petiolum attenuatis longe acuminatis denticulatis integerrimisve supra viridibus subtus pallidioribus utrinque glabris, floribus axillaribus solitariis vel aggregatis, bracteis linearibus, calycis lobis linearibus corollam subæquantibus inciso-laciniatis pilosiusculis (sub lente), corolla subclaviformi (flava) extus puberula, staminibus cohærentibus, capsula glabra. Dark woods, Cape Corrientes, Darien.

An epiphytical shrubby plant; leaves, including petiole, from 14 to 16 inches long, and in the middle about $2\frac{1}{2}$ inches broad; capsule two-valved, about 3 lines in diameter.

795. Episcia *pulchella*, Mart., Nov. Gen. vol. iii. p. 45.—*Besleria pulchella*, Don, De Cand. Prodr. vol. vii. p. 539. Cape Corrientes, Darien.

Another *Gesneriacea*, perhaps an *Alloplectus*, was collected by me in the Isthmus (Herb. no. 1053), but the specimens are too imperfect for a satisfactory determination.

LABIATÆ*.

796. Ocimum *sanctum*, Linn., De Cand. Prodr. vol. xii. p. 38. Naturalized in the neighbourhood of Panama.

797. Ocimum *micranthum*, Willd., De Cand. Prodr. vol. xii. p. 40.—Nomen vernacul. "Toronjil"? In waste places near Panama.

Ocimum minimum, Linn. (De Cand. Prodr. vol. xii. p. 33), is, on account of its agreeable odour, cultivated in the gardens of Panama.

798. Marsypianthus *hyptoides*, Mart., De Cand. Prodr. vol. xii. p. 84. About Panama viejo.

799. Hyptis *crenata*, Pohl, De Cand. Prodr. vol. xii. p. 102.—Var. *angustifolia*, Benth. MSS.; foliis angustioribus. Savanas between Nata and Santiago de Veraguas.

A shrub from 1 to $2\frac{1}{2}$ feet high; flowers pale blue.

800. Hyptis *capitata*, Jacq., De Cand. Prodr. vol. xii. p. 106. In waste places about Panama; Chagres (Fendler, no. 230.)

801. Hyptis *lantanæfolia*, Poit., De Cand. Prodr. vol. xii. p. 110. In savanas near Panama.

802. Hyptis *ferruginea*, Benth., De Cand. Prodr. vol. xii. p. 111. About Calzado largo.

"This agrees," writes Mr. Bentham, "with my character of *H. ferruginea*, a species I have never seen since I described it, except that the leaves are broader. It is probably a broad-leaved variety of *H. ferruginea*, quite distinct from *H. excelsa*." A shrub from 3 to 4 feet high; leaves about 2 inches long, and 1 or $1\frac{1}{4}$ inch broad; flowers white; blossoms in October.

803. Hyptis *spicata*, Poit., De Cand. Prodr. vol. xii. p. 121. Common all over the country, from the lower coast-region to an elevation of 5000 feet.

* In determining the plants of this Natural Order, I have been kindly assisted by G. Bentham, Esq.—*B. S.*

804. Hyptis *vulcanica*, Seem., aff. *H. Purdiæi* et *H. oblongifoliæ;* fruticosa, ramis dense subfloccoso-tomentosis, foliis petiolatis ovato-lanceolatis acutis irregulariter crenatis basi in petiolum angustatis supra viridibus villosis subtus dense albido-villosis, floribus dense capitatis vel subspicatis secundis, bracteis setaceis mollibus, calycibus mollissime villosis dentibus subulatis, corollæ tubo breviter exserto. Volcano of Chiriqui, Veraguas.

A shrub from 3 to 4 feet high; leaves, including petiole, about 4 inches long, and, in the middle, nearly 1 inch broad; flowers forming large panicles at the end of the branches.

805. Hyptis *suaveolens*, Poit., De Cand. Prodr. vol. xii. p. 126. In savanas from Panama to Santiago de Veraguas.

806. Hyptis *verticillata*, Jacq., De Cand. Prodr. vol. xii. p. 129. Banks of the river Chagres; also in and about the city of Panama.

Specimens of another species of *Hyptis*, apparently allied to *H. recurvata*, Poit., but too young for determination, were collected by me in the savanas near Panama, in October, 1846.

807. Salvia *occidentalis*, Swartz, De Cand. Prodr. vol. xii. p. 296. In waste places, common all over the country; Chagres (Fendler, no. 229).

808. Salvia *orbicularis*, Benth., De Cand. Prodr. vol. xii. p. 298. Panama (Sinclair !); Chagres (Fendl. no. 224).

809. Salvia *hyptoides*, Martens et Gall., De Cand. Prodr. vol. xii. p. 300. Southern Darien.

810. Salvia *albiflora*, Martens et Gall., De Cand. Prodr. vol. xii. p. 307. Near Cruces, Province of Panama.

Flowers white !

811. Salvia *brevicalyx*, Benth., De Cand. Prodr. vol. xii. p. 309. Volcano of Chiriqui, Veraguas.

A half-shrubby plant, about 3 feet high; flowers deep blue.

VERBENACEÆ.

It may be said that, generally speaking, all plants belonging to this Order are found in sunny, exposed positions, not in cool, shady places. In the Isthmus this remark applies without exception to all the *Verbenaceæ* hitherto observed: they either grow on the road-sides, and in waste places around human habitations, or in the savanas and on the outskirts of woods. *Petrea volubilis*, a climbing plant, is occasionally met with in the virgin forests, but it only flowers in profusion in such places where its upper branches enjoy the full influence of the sun. It is this tendency of *Verbenaceæ* to seek, under all circumstances, the rays of our great luminary, which must be considered as one of the chief reasons why they are so numerous in the tropics, occur but sparingly in temperate latitudes, and are totally excluded from the frigid zones.

812. Priva *echinata*, Juss., De Cand. Prodr. vol. xi. p. 534. In waste places, common all over the Isthmus.

813. Verbena *littoralis*, Kunth, De Cand. Prodr. vol. xi. p. 542. Volcano of Chiriqui, Veraguas.

814. Stachytarpha *dichotoma*, Vahl, De Cand. Prodr. vol. xi. p. 561. In waste places, common all over the Isthmus.

815. Lippia (§ Dipterocalyx) *Americana,* Linn., De Cand. Prodr. vol. xi. p. 579. Neighbourhood of Panama.

816. Lippia (§ Zapania) *geminata,* Kunth, De Cand. Prodr. vol. xi. p. 582. Islands in the Bay of Panama; Chagres (Fendler, no. 1107).

817. Lippia (§ Zapania) *dulcis,* Trev., De Cand. Prodr. vol. xi. p. 583. Nomen vernacul. "Orosul." On road-sides and in waste places, from Panama to Cruces.

818. Lippia (§ Zapania) *canescens,* H. B. K., De Cand. Prodr. vol. xi. p. 585. Common in waste places.

819. Lippia (§ Rhodolippia) *lupulina,* Cham., De Cand. Prodr. vol. xi. p. 592. In savanas, Province of Veraguas.

820. Lantana *Camara,* Linn., De Cand. Prodr. vol. xi. p. 598. In savanas, all over the country.

821. Lantana *trifolia,* Linn., De Cand. Prodr. vol. xi. p. 606. In savanas, Tole, Province of Veraguas.

822. Citharexylon *caudatum,* Linn., De Cand. Prodr. vol. xi. p. 612. Savanas about Panama; Chagres (Fendler).

823. Duranta *Plumieri,* Jacq., De Cand. Prodr. vol. xi. p. 615.—Nomen vernacul. "Espino de Palomo." Common in savanas.

824. Petrea *volubilis,* Jacq., De Cand. Prodr. vol. xi. p. 618.—Nomen vernacul. "Biura." On the outskirts of wood, from Cruces to Santiago de Veraguas.

825. Ægiphila *Martinicensis,* Linn., De Cand. Prodr. vol. xi. p. 652. In the neighbourhood of Panama.

826. Ægiphila *brachiata,* Cham. et Schlecht., De Cand. Prodr. vol. xi. p. 654. Volcano of Chiriqui, Veraguas.

827. Volkameria *aculeata,* Linn., De Cand. Prodr. vol. xi. p. 656. Island of Chirambira, Southern Darien.

828. Cornutia *pyramidata,* Linn., De Cand. Prodr. vol. xi. p. 681.—Nomen vernacul. "Palo cuadrado." In savanas, from Panama to Santiago de Veraguas.

829. Avicennia *nitida,* Jacq., De Cand. Prodr. vol. xi. p. 699. Common on the coast of both the Atlantic and Pacific Oceans.

BORRAGINEÆ.

830. Cordia *Gerascanthus,* Jacq. De Cand. Prodr. vol. ix. p. 472.—Nomen venacul. "Laurel." On the outskirts of woods, common in the Provinces of Panama and Veraguas.

The wood of this tree is used for building purposes

831. Cordia *Peruviana,* Rœm. et Schult., var. *Mexicana,* De Cand. Prodr. vol. ix. p. 491. In savanas, common in the neighbourhood of the city of Panama; Chagres (Fendler. no. 130).

832. Cordia (§ Myxiæ subspicatæ) *microcephala,* Willd.? De Cand. Prodr. vol. ix. p. 500.—Benth. Bot. Sulph. p. 139. Cerro de Ancon, near Panama.

My specimens agree perfectly with those collected by Sinclair in the Gulf of Fonseca, and described by Bentham in the work quoted above; I mention this fact, in case the plant taken for *C. microcephala* by Bentham should prove to be distinct from that of Willdenow.

833. Tournefortia *hirsutissima,* Linn., De Cand. Prodr. vol. ix. p. 517. Banks of the river Chagres in the neighbourhood of Gorgona, and Volcano of Chiriqui, Veraguas.

834. Tournefortia *lævigata,* Lam., De Cand. Prodr. vol. ix. p. 519. On the sea-beach near Panama; Chagres (Fendler, no. 232).

835. Heliotropium *inundatum,* Swartz, De Cand. Prodr. vol. ix. p. 539. Plentiful in places inundated during the wet season, and drying up in the beginning of the dry.

836. Heliotropium *humifusum,* H. B. K., De Cand. Prodr. vol. ix. p. 542. Near the village of Anton.

837. Heliophytum *Indicum,* De Cand. Prodr. vol. ix. p. 556.—Nomen vernacul. "Flor del alacran." In waste places, common all over the Isthmus.

Varronia rotundifolia, De Cand. (Prodr. vol. ix. p. 469), the Overal of the Peruvian deserts, is cultivated for ornamental purposes in the gardens of David; the drupe of this shrub has a tendency to fatten cattle and poultry.

PLUMBAGINACEÆ.

838. Plumbago *scandens,* Linn., De Cand. Prodr. vol. xii. p. 692. Common all over the country, especially on the sea-side.

PLANTAGINEÆ.

839. Plantago *major,* Linn., Wlprs. Rep. vol. iv. p. 179.—Nomen vernacul. "Yantin." On road-sides and in waste places, not very common.

PHYTOLACCACEÆ.

840. Petiveria *alliacea,* Linn., De Cand. Prodr. vol. xiii. p. 9.—Nomen vernacul. "Anamu." Common in waste places, Panama.

841. Phytolacca *octandra,* Linn., De Cand. Prodr. vol. xiii. p. 32. Common in waste places all over the country.

SALSOLACEÆ.

842. Chenopodium *ambrosioides,* Linn., De Cand. Prodr. vol. xiii. p. 72. City of Panama and village of Araijan, Province of Panama.

BASELLACEÆ.

843. Anredera *scandens,* Moq. Tand., De Cand. Prodr. vol. xiii. p. 230.—*Polygonum scandens,* Linn. Spec. p. 522. Common in hedges all over the country.

AMARANTHACEÆ.

844. Chamissoa *altissima*, Kunth, De Cand. Prodr. vol. xiii. p. 250. In savanas, near Panama.

845. Chamissoa *acuminata*, Mart., De Cand. Prodr. vol. xiii. p. 251. In forests near the Hacienda de Juan Lanas, Province of Panama.

846. Amaranthus *spinosus*, Linn., De Cand. Prodr. vol. xiii. p. 260.—Nomen vernacul. "Bledo espinoso." Common in waste places all over the country.

This plant, although an annual, very often becomes woody. Dr. Robert Macdowall, of David, in Veraguas, in a note to Mr. A. J. de Warszewicz, a copy of which was kindly communicated to me by Daniel Hanbury, Esq., has the following remarks on the properties and uses of this plant:—"It is employed in a great many cases of intestinal irritation, and always with good effect. It seems to act by cooling and allaying the local and general irritation, which in the climate of the Isthmus always accompany diarrhœa or dysentery,—perhaps from the abundance of mucilage with which is combined the active principle, whatever that may be. The natives give it in fever, combined with other herbs. It answers very well to take the fresh root, cut in pieces, and make an infusion in cold water; in a short time the water becomes charged with a mucilaginous substance. With sugar it also makes an agreeable drink, as the root has no bad taste. United with laudanum, it has been found useful in the premonitory symptoms of Asiatic cholera, and in all the derangements of the biliary system."

847. Cyathula *achyranthoides*, Moq., De Cand. Prodr. vol. xiii. p. 326.—Nomen vernacul. "Cadilla." In half-shady places, common all over the country.

848. Irisine *elatior*, Rich., De Cand. Prodr. vol. xiii. p. 343. In forests near Panama.

849. Irisine *diffusa*, Humb. et Bonpl., De Cand. Prodr. vol. xiii. p. 345. In forests near Panama; Chagres (Fendl. no. 260).

850. Irisine *eriophylla*, Moq., De Cand. Prodr. vol. xiii. p. 347. Island of Taboga, Bay of Panama.

851. Teleianthera *polygonoides*, Moq., var. *compacta*, Moq., De Cand. Prodr. vol. xiii. p. 364. In roads, on fields, and in waste places, near Panama.

852. Teleianthera *pubiflora*, Moq., var. *monocephala*, Moq., De Cand. Prodr. vol. xiii. p. 376. On road-sides near Panama.

Gomphrena globosa, Linn., and *Celosia cristata*, Linn., are cultivated in the gardens of Panama, but they are not wild, or even naturalized, in any part of the Isthmus.

NYCTAGINEÆ.

853. Mirabilis *Jalapa*, Linn., De Cand. Prodr. vol. xiii. p. 427.—Nomen vernacul. "Buenos tardes." Common in waste places, on road-sides, especially in the vicinity of Panama.

The vernacular name of this plant, "*Buenos tardes*," or "Good evening," is derived from the well-known peculiarity of the flowers to open towards sunset, which has also procured for it in the West Indies the appellation "Four o'clock."

854. Pisonia *aculeata*, Linn., De Cand. Prodr. vol. xiii. p. 440. In the savanas near Panama.

855. Pisonia *Pacurero*, Kunth (Tab. XXXIV.); arborescens, foliis oppositis vel sparsis oblongo-ellipticis basi acutis apice acutis vel acuminatis utrinque glabris, junioribus nigrescentibus, floribus hermaphroditis vel dioicis, cymis masculis vel hermaphroditis terminalibus laxis plurifloris, fœm. strictioribus, perigonio campanulato vel tubuloso, staminibus in florib. masc. exsertis, in fœm. et hermaph. inclusis.—Kunth in H. et B. Nov. Gen. et Sp. vol. ii. p. 218.—Choisy in De Cand. Prodr. vol. xiii. p. 442. In dark forests near Cruces, Province of Panama.

The hermaphrodite plant represented in Plate XXXIV. has the stamens always included in the tube of the perigonium, and might on that account be classed with *Neea* as well as with *Pisonia;* at all events it shows that the genus *Neea* is not tenable, since, as Choisy informs us (De Cand. Prodr. vol. xiii. p. 447), "Genus (Neea) ad Pisoniam propius accedens, staminibus inclusis tantum separandum," and must therefore be united with *Pisonia.*

Plate XXXIV. Fig. 1, 2, perigonia; 3, perigonium cut open; 4, stamens and pistil; 5, ovary cut open, and style:—*all magnified.*

856. Boerhaavia *paniculata*, Rich., De Cand. Prodr. vol. xiii. p. 450. In waste places, on road-sides, common.

POLYGONACEÆ.

856. Polygonum *acre*, H. B. K., Meisn. Monog. Gen. Polygon. p. 77. Banks of the river Santa-maria, Province of Panama.

857. Coccoloba *uvifera*, Linn. Syst. Vegetab. (edit. Persoon) p. 405. Chagres (Fendler).

Most littoral plants found in the West Indies, such as *Conocarpus erecta, Hibiscus tiliaceus, Crescentia cucurbitina*, etc., are also met with on the shores of the Pacific Ocean; but *C. uvifera* does not seem to have crossed the Isthmus, although it grows at Chagres. All the specimens I have seen were collected on the coast of the Atlantic, viz. Jamaica (Seemann), Cuba (Mason), St. Vincent (Guilding), Barbadoes (Seemann), Bahamas (Herb. Hook.), La Guayara (Moritz), and Cayenne (Martin).

858. Coccoloba *leptostachya*, Benth. Bot. Sulph. p. 159.—Wlprs. Ann. Bot. vol. i. p. 551. In savanas of Panama and Veraguas; collected by Barclay in Central America.

859. Coccoloba, sp. Panama, in savanas.

There are only the leaves and imperfect flowers of this species in the collection.

860. Triplaris *Cumingiana*, Fisch. et C. A. Mey. Bemerk. Polygon. p. 14.—Benth. Bot. Sulph. p. 160. Near the village of Remedios, Province of Veraguas.

PROTEACEÆ.

861. Rhopala *complicata*, H. B. et Kunth, Nov. Gen. et Sp. vol. ii. p. 153. t. 119.—Nomina vernacul. "Carne asada," et "Sajino." In stony places, all over the country.

LAURINEÆ.

862. Persea *gratissima*, Gaertn. Nees ab Esenb. System. Laurinar. p. 128.—Nomen vernacul. "Aguacate." Cultivated extensively, on account of its edible fruit.

This tree is known in America under the various names of Alligator Pear, Avocado Pear, Abogate, Aguacate, Ahuacate, etc.; all of which appear to be derived from the Aztec word "Ahuacatl," the appellation applied to it by the ancient Mexicans.

863. Persea (§ Eriodaphne) *Veraguasensis*, Seem.; arborea, ramulis, petiolis, foliis paniculisque rufo-sericeis demum glabrescentibus, foliis longe petiolatis ellipticis utrinque attenuatis, laciniis perianthii ovatis acutis, exterioribus paulo brevioribus, bacca globosa glabra lucida. Volcano of Chiriqui, Veraguas.

A tree, about 60 feet high. Petiole from 1 inch to 1 inch 3 lines long. Leaves from 4 to 4½ inches long, and in the middle nearly 2 inches broad. Has the habit of *P. Carolinensis*, Nees ab Esenb., and *P. alba*, Nees ab Esenb.

864. Nectandra *glabrescens*, Benth. Bot. Sulph. p. 161. Outskirts of woods; common in the neighbourhood of Panama.

865. Oreodaphne *glomerata*, Nees ab Esenb., Wlprs. Ann. vol. iii. p. 312. Cape Corrientes, Darien.

Approaches very closely to *O. opifera*, Nees ab Esenb.; if, indeed, the two are distinct species. The leaves, when young, are on both sides covered with silky hair, which, as they get older, disappear. Some of the largest leaves of my specimens are more than a foot long; the perianthium is of a fine rose-colour.

ARISTOLOCHIEÆ.

866. Aristolochia *trilobata*, Linn. Syst. Veg. (ed. Persoon), p. 865. Chagres (Fendl. no. 440).

867. Aristolochia *odoratissima*, Linn. Syst. Veg. (ed. Persoon), p. 869. Common about Panama.

868. Aristolochia *pilosa*, Kunth, in Humb. et Bonpl. Nov. Gen. et Sp. vol. ii. p. 116. t. 113. San Lorenzo, Province of Veraguas.

This species was found in Peru (Mathews), and in New Granada (Goudot, Purdie).

869. Aristolochia *reticulata*, Seem.; fruticosa, volubilis, ramis pubescentibus, foliis cordato-oblongis integerrimis apice obtusis vel breviter cuspidatis coriaceis tripli- vel quintuplinerviis supra lævibus glabris subtus arcte reticulato-venosis pubescentibus, stipulis deciduis, floribus axillaribus solitariis, perigonio unilabiato, labio cordato longe acuminato integerrimo extus villoso intus glabro, staminibus 6. David, Province of Veraguas; Tarapota, Peru (Mathews).

Allied to *A. cynanchoides*, Mart. Leaves alternate, 2–5 inches long, and 1–1½ inch broad; perigonium 3½ inches long; capsule 1½ inches long.

LACISTEMEÆ.

870. Lacistema *myricoides*, Swartz, Flora Ind. occ. vol. ii. p. 1093.—*Piper aggregatum*, Berg. Woods about Cruces, Province of Panama.

URTICACEÆ.

871. Urera *baccifera*, Gaud. ad Freycinet, p. 497.—*Urtica baccifera*, Linn. Syst. Veg. (ed. Pers.), p. 595.—Nomen vernacul. "Ortiga." Common in waste places.

Linden collected this species at Caracas; in the Isthmus it is used for making hedges.

872. Urera *girardinioides*, Seem.; fruticosa, caule petiolis foliisque subtus ad nervos dense aculeatis, aculeis rectis, foliis alternis late cordatis pinnatifidis, lobis acutis integerrimis vel inferioribus sæpe sinuatis glabris 3–5-nerviis, paniculis axillaribus inermibus, floribus fœmineis sessilibus glabris 5-phyllis, phyllis carnosis, floribus masculis . . . .—Woods near Cruces, Province of Panama.

A shrub about 10 feet high, bearing some resemblance to *Girardinia Leschenaultiana*, Dene.; leaves, including the petiole, about 1 foot long, and at the base about 6 inches broad; panicles glabrous. Goudot found it in Cauca, New Granada.

873. Fleurya *æstuans*, Gaud. ad Freycinet, p. 497.—*Urtica æstuans*, Linn. Syst. Veg. (ed. Pers.), p. 894. On walls and rocks in shady places, common all over the country.

This plant has been collected in the following stations:—Barbadoes (Lane), Cumana (Funke), Demerara (Parker), Surinam (Hostmann), Pernambuco (Gardner), and Bahia (Salzmann).

874. Myriocarpa *stipitata*, Benth. Bot. Sulph. p. 168. t. 55.—Wlprs. Ann. vol. i. p. 646. Cape Corrientes, Darien.

875. Pilea *muscosa*, Lindl.—*Parietaria microphylla*, Linn. Syst. Veg. (ed. Pers.), p. 950. On damp walls and rock, in shady places; common all over the country.

This plant is diffused over the West Indies, Mexico, New Granada, and Peru.

876. Pilea *pumila*, A. Gray, Wlprs. Ann. vol. iii. p. 414. In shady places, Santiago de Veraguas.

877. Pilea *centradenioides*, Seem.; caule diffuso radicante pubescente hirsuto, foliis oppositis cujusve paris valde inæqualibus lanceolatis acuminatis grosse serratis, serraturis integerrimis, basi inæquilateraliter cuneatis, triplinerviis, supra atro-viridibus pilis adpressis, subtus pallidioribus pubescentibus, stipulis membranaceis cordato-oblongis obtusis, floribus . . . . In dark woods, Cape Corrientes, Darien.

A half-shrubby plant. Leaves like those of *P. variegata*, Seem., of unequal size, as in *Centradenia rosea*, Lindl.; the largest of each pair petiolate, 1½–2 inches long, and 4 lines broad, the smallest sessile, and 4–5 lines long, and about 2 lines broad. Stipules 1½ line long, brown. Flowers were unfortunately lost.

878. Pilea *variegata*, Seem.—*Urtica variegata*, Sprengl. Syst. Veg. vol. iii. p. 839. Dark forest of Cape Corrientes, Darien.

ARTOCARPEÆ.

(*Auctore F. A. W. Miquel.*)

Tribus I. Ficeæ.

879. Pharmacosycea *rigida*, Miq.; ramis læviusculis ramulisque glabris, foliis lanceolate vel obverse oblongis breviter obtusiuscule apiculatis, basi acutis aut subcuneatis, rigide coriaceis, supra puncticulato-asperis, subtus pilis brevissimis deciduis scabro-asperulis, præter basin subtrinerviam costulis utrinque 10–12 subpatulis ante marginem arcuato-junctis, validis, cum tenuioribus interjectis reticulato-anastomosantibus, receptaculis . . . .—*Pharmacosyceæ glaucescenti* et *Ph. Hernandesii*, Liebmann (Kongl. Vidensk. Selsk. Skrift. 5. räkke, Natur. og Math. afd. 2. Bind. p. 332. no. 3 et 4), accedere videtur. Island of Coyba, coast of Veraguas.

Rami cylindrici, farcti, ligno albido, cortice sordide luteolo ramulorum epidermide desquamante, glabri, vix omnino læves. *Stipulæ* ovato-lanceolatæ, glabriusculæ, 2 fere 3 lin. longæ. *Petioli* antice planiusculi. *Folia* supra petioli insertionem sub lente emarginata, supra saturate viridia, subtus pallida, costisque valde prominentibus, $3\frac{1}{2}$–$4\frac{3}{4}$ poll. longa, $1\frac{1}{2}$–$1\frac{3}{4}$ supra medium lata.

880. Pharmacosycea *anthelmintica*, Miq., Lond. Journ. of Bot. vol. vii. p. 66.—Nomen vernacul. "Higueron." Banks of rivers, Province of Panama.

881. Urostigma *nymphæifolium*, Miq.? Hook. Lond. Journ. of Bot. vol. vi. p. 527.—*Ficus*, Linn. Southern Darien.

Folia duo suppetentia minora, ovato-rotundata, obtuse breviter apiculata, basi conniventi-cordata, 5–7-nervia et utrinque 4–6-costata, 5–7 poll. longa, forma et nervatione itaque a specie genuina nequaquam diversa et verosimiliter ad eam referenda.

882. Urostigma sp. prope *U. intramarginale*, Liebm. l. c. p. 320. n. 2, cum *U. lapathifolio*, Liebm. l. c., valde affine *U. crocato*, Miq., et ex specimine sterili haud tuto determinandum. Veraguas.

883. Urostigma *Liebmannianum*, Miq.; petiolis, stipulis costisque sub innovatione ad lentem subpulverulentis, ramis ramulisque strictis subcylindricis glabris albidis, foliis modice petiolatis coriaceo-pergamaceis obovato-ellipticis oblongisve, breviter subacute apiculatis, basi acutiuscula subemarginulatis, utrinque punctatis, venis numerosis patentibus juxta marginem lævem incurvulum conjunctis, supra magis quam subtus distinctis, costa utrinque prominente, receptaculo (solitario, an semper?) pedunculato globoso, ore squamis 3 latis occluso, basi involucro bilobo.—Prope *U. ovale*, Liebm. l. c. p. 324. n. 13. Banks of the river Chagres.

Folia versus apices ramulorum conferta. *Petioli* antice profunde canaliculati, $1\frac{1}{2}$–$3\frac{1}{2}$ lin., laminæ $1\frac{1}{2}$–3 poll. longæ, $\frac{3}{4}$–fere $1\frac{1}{2}$ supra medium latæ, punctis albidis prominulis, ad lentem conspicuis. *Stipulæ* parvæ, ovatæ, convolutæ. *Pedunculus* gracilis, petiolum parum superans. *Receptaculum* piso paullo majus. *Perigonia* fusca. *Flores masc.* monandri, pauci, reliqui omnes fœminei jam deflorati.

884. Urostigma *sapidum*, Liebm. l. c. p. 327. (Tab. XXXV.)—Nomen vernacul. "Higuito." David, Veraguas.

Arbor 30–40-pedalis. *Folia* speciminis nostri vix 8–9 lin. lata, paullo angustiora, itaque quam in Liebmanniano a cl. Oersted in Costa Rica lecto. Cæterum nostra supra ad lentem punctulata, subtus epunctata, utrinque lævia.—Omnia hæc *U. Schiedeano* et *U. prinoidi* affinia sunt.

Plate XXXV. Fig. 1 and 2, receptacula; 3, 4, 5, perigonia; 6, 7, ovaria; 8, one of the bracts intermixed with the flowers:—*all magnified.*

885. Urostigma *Oerstedianum*, Miq. (Tab. XXXVI.); glabrum, foliis breviter petiolatis densis obverse oblongis lanceolatisve obtuse apiculatis vel plane obtusis, basi subcuneato-acutis, pergamaceo-coriaceis, utrinque impresso-punctulatis, venis numerosis erecto-patulis prope marginem junctis, utrinque tenere reticulatis, stipulis lanceolatis coriaceis cum petiolo nascente subpulverulentis, receptaculis axillaribus geminis pedunculatis globosis, ore bracteis 3 occlusis.—Volcano of Chiriqui, Veraguas.

Species foliis parvis insignis, cæterum iisdem ac præcedens speciebus affinis.—*Arbor*. *Rami* cylindrici; ramuli subangulati, strictiusculi, siccitate desquamantes. *Petioli* antice canaliculati, 1–2 lin. longi. *Folia* $1\frac{1}{2}$–$2\frac{1}{2}$ poll. longa, 3–$5\frac{1}{2}$ lin. supra medium lata, in sicco fuscula, costa valida. *Pedunculi* 2–3-lin., teretiusculi, graciles; *involucrum* bilobum, lobis obtusis. *Receptacula* in sicco lutescentia vel etiam fusco-maculata, fragilia, matura piso fere minora. *Achænia* angulato-globosa, pallida, perigoniis fuscis partim inclusa.

Plate XXXVI. Fig. 1 and 2, receptacula; 3, receptaculum cut open; 4, ovary; 5 and 6, different states of the ovaries; 7, embryo:—*all magnified.**

Tribus II. Olmedieæ.

886. Olmedia? *armata*, Miq.; ramulis, stipulis, costa foliorum subtus, bracteisque aculeatis, foliis lato-ovatis obtusiusculo-apiculatis, basi (uno latere quasi resecto) inæquali rotundatis, utrinque 7–8-costatis, floribus fœmineis axillaribus geminis sessilibus, bractearum involucro communi receptis.—Nomen vernacul. "Namagua." River Cupica, and Cape Corrientes, Darien.

Valdopere dolendum, stirpem admodum memorabilem ex unico parvulo ramulo vix certe definiendam nec apte describendam esse. Si hujus generis esse ultro comprobatur, propriam sectionem, *fl. fœm. geminatis*, efficiet.—*Arbor* 40–60-pedalis. *Aculei* breves, crassi, conici, fusci, nitidi, apice albi, quasi pilorum urentium compage, in stipula densi, cæterum sparsi. *Pili* albi, setulosi, in bracteis et stipulis aculeis intermixti. *Petioli* circiter semipollicares. *Folia* 16 poll. longa, $7\frac{1}{2}$–10 lata, coriacea, glabra, supra saturate viridia, nitida, subtus pallida, utrinque lævia. *Stipula* convoluta, subspathacea, ultrapollicaris, cicatricem obliquam circularem relinquens. *Perigonium fœm.* coriaceum, ovoideo-tubulosum, tubo 4-fido, segmentis subovatis præfloratione valvatis? *Stylus* exsertus; stigmata duo teretiuscula, partim diffracta. *Bracteæ* lanceolato-lineares, coriaceæ, partim concretæ, obtusæ.

"From the liber of this tree the Indians manufacture sails for their canoes, garments, and mats for sleeping upon."—*B. Seem.*

Tribus III. Conocephaleæ.

887. Cecropia *strigosa*, Trécul in Ann. des Sc. Nat. 3me Série, vol. viii. p. 82.—Nomen vernacul. "Guasimo." Common in the savanas all over the country.

Tribus IV. Euartocarpeæ.

888. Artocarpus *incisa*, Linn., Trécul in Ann. des Sc. Nat. vol. viii. p. 110.—Nomen vernacul. "Palo de pan." Cultivated.

"The Breadfruit-tree, although it succeeds well in all the warmer parts of America, is cultivated more for ornamental than useful purposes. Indeed, the fruit (*syncarpium*) has such a peculiar flavour, that to

* "*Ficus Carica*, Linn. ('Higo de Castilla' of the Isthmians), is cultivated in gardens about Panama, but more for curiosity than use."—*B. Seem.*

eat it will always be considered an acquired taste; even in Polynesia itself, where the fruit arrives at perfection, it is by no means generally liked; the Sandwich Islanders, for instance, never touch it. In the Isthmus the people merely use the seeds, which, after being toasted, as we do chestnuts, are eaten. There are, however, some trees which always bear sterile achænia."—*B. S.*

CELTIDEÆ.

889. Sponia *canescens*, Dcne. Wlprs. Ann. vol. iii. p. 406. Southern parts of Darien.

I have two or three forms of this species; they can hardly be considered as varieties, as, according to the locality in which the plant grows, the leaves are larger or smaller, and the flowers more or less contracted.

CUPULIFERÆ.

890. Quercus *aristata*, Hook. et Arn. Bot. Beech. p. 444. Volcano of Chiriqui, Veraguas.

891. Quercus *glabrescens?* Benth. Plant. Hartweg. p. 56. Volcano of Chiriqui, Veraguas.

In the absence of fruit, it is impossible to be quite positive about the determination of this species.

BETULACEÆ.

892. Alnus *Mirbelii*, Spach, Ann. des Sc. Nat. 2de Série, vol. xv. p. 204. Volcano of Chiriqui, Veraguas.

PODOSTEMEÆ.

893. Marathrum *fœniculaceum*, H. B. et K., Plant. Æquinoct. vol. i. p. 40. t. 11.—*M. oxycarpum*, Tulasne, Podost. p. 76!—Nomen vernacul. "Passe carne." In all the rivers of Veraguas, and Western Panama.

This plant grows on the stones of the rivers, and produces abundance of leaves during the wet season of the year, when the water in the beds is high, and it is quite submersed; during the dry season, when the water is low, and the plant itself not submersed, it is almost without leaves, and at that period bears flowers. In Veraguas the stalk of the leaves is boiled and eaten, having the taste of French beans, and being so much appreciated by the inhabitants that they have called the plant *Passe carne, i. e.* surpasses meat. My specimens in Hooker's Herbarium were referred by M. Tulasne to two different species, although they were gathered from the same plant; the leaves he put with *M. fœniculaceum*, H. B. K., the flowers with *M. oxycarpum*, Tulasne. I must add that *M. oxycarpum*, Tul., was founded upon specimens collected by me, not by Lehmann, as is stated, by a typographical error, in Tulasne's monograph.

PIPERACEÆ.

(*Auctore F. A. W. Miquel.*)

894. Peperomia *pellucida*, H. B. K., Miq. Syn. Pip. p. 79. On walls and rocks, common about Panama; Chagres (Fendler, no. 302).

895. Peperomia *quaternata*, Miq.; ramosa, succulenta, ramis tetragonis cum petiolis foliisque subtus longiuscule haud dense pilosis, foliis brevissime petiolatis quaternis obovato- vel elliptico-rotundatis utrinque obtusis, margine incurvulis, nitidis, supra glabris et impresso-punctatis (perforatis), subtus trinerviis, amentis . . . . Volcano of Chiriqui, Veraguas.

Prope *P. reflexam*, *P. Berlandieri*, et *P. edulem*, quarum staturam et habitum præ se fert. *Caulis* basi radicans, rami erecti, inferne glabri, superne, exceptis angulis, piliferi, faciebus concavis. *Petioli* ½ lin., *folia* 2–2½ raro 3 lin. longa, supra secundum costam leviter canaliculata, siccitate rugulosa.

896. Peperomia *Seemanniana*, Miq. (Tab. XXXVII.); carnosa, glabra, e basi radicante erecta, ramosa, foliis oppositis breviter petiolatis, inferioribus elliptico- superioribus lanceolato-oblongis acuminatis, basi acutis, obtecto-7–5-nerviis, subtus pallidis, amentis superne axillaribus oppositis modice petiolatis densifloris, bractearum peltis rotundato-ovatis margine pallido erosulis, stigmate antico ? Volcano of Chiriqui, Veraguas; epiphytically on trees.

Cum flores nondum bene efformati sint, Sectio adhuc dubia. Probabiliter ad Sect. *Rhynchophorum* referenda.—*Herba* circiter pedalis, dichotome vel opposite ramosa, ramulis subangulatis. *Petioli* antice canaliculati, basi dilatati, nodum submarginantes, 2 lin. longi. *Folia* opposita, an et terna? in sicco crassius coriacea et utrinque ad lentem punctulata, marginibus extenuatis integerrima, 2½, vulgo 3, raro 4 poll. longa, 1¾–½ lata. *Pedunculi* 2–4 lin. longi. *Amenta* juvenilia 1–2 poll. longa, 1 lin. circiter crassa, cylindracea, obtusa; bracteæ pedicellato-peltatæ, densissimæ. *Stamina* 2, adhuc occultata. *Ovarium* fossulæ immersum, nondum rite efformatum.

Plate XXXVII. Fig. 1, portion of catkin; 2, 3, bracts; 4, anther:—*all magnified.*

897. Peperomia *distachya*, A. Dietr. Miq. l. c. p. 184? In specimine haud satis completo ab affinibus haud satis distingui potest. About Panama, growing on trees.

898. Peperomia *cyclophylla*, Miq. MSS.—*Acrocarpidium rotundifolium*, Miq. l. c. p. 62, excl. syn. H. B. K.—Nomen vernacul. "Garapatillo." Common about Panama, growing on trees.

899. Pothomorphe *Ottonis*, Miq. l. c. p. 207. Nov. Act. N. Cur. tom. xiii. suppl. p. 27. tab. 25. Bahia Honda, Veraguas.

A specimine in Venezuela lecto, pedunculis 2–7-stachyis saltem differt. Cæterum hæc species *Poth. peltatæ* valde affinis.

900. Enckea *smilacifolia*, Kunth, Miq. l. c. p. 351. Woods about San Juan and Panama viejo.

Ad hanc speciem probabiliter pertinet *Piper decumanum* (Herb. Willd.), a Bredemeyer in India occidentali lectum, necnon specimen in ins. Trinidad a cl. de Schach lectum Herb. Hooker (London Journ. of Botany, vol. x. p. 440, no. 2). *Folia* inferiora hujus stirpis et superiora etiam speciminum vegetiorum majora et 9-nervia esse videntur. Quodsi ulteriori observatione comprobatur, etiam *Enckea platyphylla*, Benth. (Sulphur, p. 167), huic speciei subscribenda erit. In specimine supp. baccæ sunt depressæ, stigmata quatuor brevia concavata, disculo communi inserta.

901. Artanthe *caudata*, Miq. l. c. p. 380. no. 1. Bahia Honda, Veraguas.

902. Artanthe *catalpæfolia*, Miq. l. c. p. 382. no. 3. Common about Panama.

903. Artanthe nov. species, *A. tiliæfoliæ* et *A. caladiifoliæ* affinis. Village of Araijan, Province of Panama.

Ex unico folio haud determinanda; hoc ovatum, 10 poll. longum, subabrupte acuminatum, basi breviter 7-nervia leviter cordatum, utrinque 6–7-costatum, glabrum, coriaceum, nitidum.

904. Artanthe *imperialis*, Miq. (Tab. XXXVIII.); foliis maximis elliptico-oblongis acutiusculis, basi valde inæqualiter cordatis (sinu fere laterali, lobo majori petiolum tegente) crasse coriaceis, supra glabris, subtus hic 7- illic 10-costatis, costis inferioribus e basi, reliquis usque ⅔ laminæ ortis, erecto-patulis, suprema utrinque ad apicem ducta, omnibus crasse reticulatis et subincano-pubescentibus, amento (supp.) folio breviore, bracteis conchæformibus ciliolatis, ovario glabro, stylo teretiusculo, stigmatibus 2 teretiusculis patulis, baccis obovoideis. Island of Cacagual, Darien.

Sectio *Macrostachys*.—Statura grandi, præsertim vero pistilli forma et baccis facile distinguitur. *Petiolus* suppetens tripollicaris, alatus. *Folium* subcoriaceum, obsolete pellucido-punctatum, siccitate fuscescens, subtus pubescens et valide costatum, a basi lobi majoris 20 poll. longum, 11½ supra medium latum. *Pedunculus* glabriusculus, 2 poll. longus, pennam corvinam crassus. *Amentum* circiter pedale. *Bracteæ* coriaceæ, baccis demum superatæ et serius fere glabræ. *Semen* obovoideum, testa atrofusca.

Plate XXXVIII. Fig. 1 and 2, bracts; 3, berry; 4, the same cut open; 5, seed; 6, embryo:—*all magnified.*

905. Artanthe *Seemanniana*, Miq. (Tab. XXXIX.); ramulis petiolis (alatis) glabriusculis, foliis tenuiter membranaceis vix pellucido-punctatis lato-ellipticis acutis, basi valde inæquali profunde cordatis lobo majori petiolum æquante, supra pilis brevissimis inspersis, subtus in costa costulisque (utrinque 6–7 erectiusculis), venisque pilis horizontalibus instructis, haud scabridis, ad lentem punctulatis, amentis longiter pedunculatis folio paullum brevioribus, erectis, rectis, bracteis triangulari vertice ochraceo-hirtis, baccis obovoideo-subpyramidatis glabris. Southern Darien.

Sectio *Macrostachys*.—Affinis *A. decurrenti* et *A. lapathifoliæ*. *Ramuli* fistulosi, striulati. *Petioli* circiter bipollicares, alis conniventibus sursum angustatis undulatis subcoriaceis. *Folia* a lobi majoris basi 10½–11 poll. longa, 5¾–6 lata, supra læte viridia, subtus pallida, costulis tenuibus usque ⅔ longitudine a basi dispositis, patule adscendentibus, infimis paucis tenerioribus e basi ortis. *Pedunculi* 1½–2 poll. longi. *Amenta* 8–9 poll. æquantia. *Flores* annulatim dispositi, densi. *Stamina* 4; antheræ subglobosæ, pallidæ. *Ovarium* ovoideum.

Plate XXXIX. Fig. 1, portion of catkin; 2, 3, bracts; 4, hair of bract; 5, 6, ovary and stamens; 7, stamen; 8, ovary cut open:—*all magnified.*

906. Artanthe *tuberculata*, Miq. l. c. p. 497, no. 138. Savanas about Panama.

907. Artanthe *septuplinervia*, Miq. (Tab. XL.); glabra, ramulis cylindricis nodosis, foliis brevissime petiolatis e basi inæquali leviter subauriculatim cordata, ellipticis vel ovato-ellipticis acute acuminatis, rigide membranaceis, pellucido-punctatis subtusque tenere puncticulatis, costis infra medium ortis utrinque 3 alternis, hinc septuplinerviis, una utrinque arcuatim in acumen adscendente aream transverse venosam includente, amentis breviter pedunculatis folio brevioribus cylindricis obtusis, bractearum vertice peltato centro nudo, cæterum luteo-griseo-villoso, baccis obpyramidato-trigonis vertice umbilicatis glabris.

E sectione *Hemipodion*, licet quodammodo heterogenea, et quibusdam speciebus e sectione *Isophyllon* accedens. *Internodia* ramulorum cylindracea, brevia, nodi crassi. *Petioli* 1–1½ lin. *Folia* 3–4½ poll. longa, 1½–1¾ lata, supra saturate viridia, subtus pallida, cum ramulis lævia. *Pedunculi* 2 lin. *Amenta* 1–1½ poll. longa.

Plate XL. Fig. 1, portion of catkin; 2, bract, ovary, and one of the stamens; 4, 5, sections of ovary:—*all magnified.*

908. Artanthe *calocoma*, Miq.; innovationibus foliisque subtus in nervis tenere puberis glabrescentibus, ramulis trigonis, foliis breviter petiolatis lato-ellipticis æquilateris acutis vel breviter apiculatis, basi ima aliquid inæquali acutis, membranaceis, utrinque glandulose punctatis, supra glabris, venis costalibus utrinque 14–16 erecto-patulis, secus marginem subconjunctis, pedunculis petiolum superantibus, amentis folio multum brevioribus cylindricis crassis rectis, bracteis peltato-conchæformibus vertice ciliolatis, baccis densis obovoideis granulatis. Southern Darien.

Foliorum basi licet non plane æquali, apte tamen ad sectionem *Isophyllon* referenda, habitu *A. amplam* et *A. macrophyllam* æmulat. *Rami* ramulique subfistulosi, striulati. *Petioli* nodum subvaginantes, 3 lin.

circiter longi. *Folia* supra saturate viridia, subtus pallidiora, tactu lævia, venatione tenera sed distincta, 9 pollices longa, 4½-fere 5 lata. *Pedunculi* semipollicares. *Amenta* baccifera 3 poll. longa, 2½ lin. crassa. *Bractearum* vertex præter aream angustam transversam pube grumosa sordide flavida tectus.

909. Artanthe *trinervia*, Miq. (Tab. XLI.); glabra, præter pubem innovationum tenerrimam subpulverulentam, foliis breviter petiolatis oblongo-lanceolatis acuminatis, basi acutis, subcoriaceis pellucido-punctatis, supra lævibus, nitidis, subtus nervo utrinque paullo supra basin libero (raro altero adhuc altius exserto) secus marginem adscendente venasque numerosas horizontales omnes connectente subtrinerviis, amentis unilateraliter patentibus cylindricis crassis folio brevioribus, bracteis pedicellato-peltatis, vertice trigono præter centrum nudum villosis, baccis obovoideis glabris. Western Veraguas.

Sectio *Isophyllon*; *Artanthe Paraënsi* quodammodo accedit. *Ramuli* tenues, cylindrici, striulati et nodosi. *Petioli* antice canaliculati, 1½ vix 2 lin. longi. *Folia* circiter 5 poll. longa, 1½–1¾ infra medium lata, nitida, polita, saturate viridia. *Pedunculi* 3–4 lin. longi. *Amenta* circiter bipollicaria vel paullo longiora; axis longitudinaliter sulcatus. *Baccæ* annulatim dispositæ, densæ, vix angulatæ, læves, umbilicatæ. *Semen* obovoideum. *Bractearum* pedicellus superne dilatatus et ciliatus.

Plate XLI. Fig. 1, portion of catkin; 2, 3, 4, bracts; 5, berry; 6, the same cut open; 7, seed:—*all magnified*, and the last three in a young state.

910. Artanthe *tricuspis*, Miq. (Tab. XLII.); subglabra, foliis e basi cuneata trilobis, lobis lateralibus brevibus patulis triangularibus acutis, sinu lato a lobo medio elongato lineari-lanceolato diremtis, utrinque glanduloso-punctatis, glabris, junioribus margine puberis, membranaceis, amentis breviter pedunculatis brevissimis, bracteis pedicellato-peltatis, verticis centro nudis, cæterum ochraceo-villosis. Southern Darien.

Foliis lobatis in toto Ordine heterogenea, hac nota unice *Enckeæ* specie adhuc ineditæ foliis panduratis instructæ accedens, cæterum *A. Brunonianæ* affinis.

Ramuli teretiusculi, striulati. *Petioli* tenues, 1–1⅓ poll. longi. *Folia* 4–5 poll. longa, basi super lobos laterales 2–3 poll. lata, lobo medio plusquam ½ folii partem sistente, basi 3 lin. lata. *Pedunculi* 2. *Amenta* 3 lin. longa, juvenilia.

Plate XLII. Fig. 1, bract; 2, 3, anthers:—*all magnified.*

911. Artanthe *adunca*, Miq. l. c. p. 449; forma ramulis tomentellis; an species? Savanas about Panama.

Ramulis dense tomentellis, petiolis pedunculisque pubescentibus, foliis angustioribus firmioribus a specie differt, nervatione, colore ac amentis curvatis autem congruit.

912. Artanthe *ulmifolia*, Miq.? l. c. p. 472. no. 110; specimen ut videtur paullo magis pubescens. Savanas about Panama.

913. Ottonia *glaucescens*, Miq.; frutescens, humilis, ramis striulatis, foliis ovatis vel ovato-oblongis longiuscule acute acuminatis, basi æquali acutis vel obtusis, membranaceis, pellucido-punctatis, glabris, supra læte viridibus, subtus glaucis, venis patulis utrinque 6–7 tenuissimis fere obtectis, amentis brevibus breviter pedunculatis.—Nomen vernacul. "Barbasco." Woods of Darien.

Adulta glabra, sed innovationes sub lente vix omnino glabræ. *Petioli* tenues, 2–2½ lin. longi. *Folia* 4–5½ poll. longa, 1½–2½ lata, margine extremo sub lente expallido. *Amenta* tantum virginea, quare de floribus pedicellatis vel sessilibus nil statuendum.

"The leaves of this species are used by the Indians for stupefying fish."—*B. Seemann.*

CYCADEÆ.

914. Zamia *Chigua*, Seem. (Tab. XLIII.); caudice subcylindrico, frondium stipite rhachique spinosis tomentosis, demum glabris, foliolis alternis ovato-lanceolatis falcatis cuspidato-acuminatis obsolete denticulatis glabris, cono masculo pedunculato cylindrico, fœmineo multo majore oblongo-cylindrico obtuso.—*Z. Lindleyi*, Warsz. Alb. Dietr. in Otto et Dietr. Allg. Gartenz. vol. xix. p. 146, cum icon.?—Nomen vernacul. "Chigua." Islands at the mouth of the river San Juan in Darien; and, if Warszewicz's plant is identical with mine, also in Western Veraguas.

M. von Warszewicz has described his *Zamia Lindleyi* from a drawing and a note which he made when travelling in Veraguas, both of which were so imperfect that Dr. Albert Dietrich could not publish such a description as would enable other botanists to recognize the plant; and as I do not possess original specimens of Warszewicz's species to guide me, I have been compelled, *nolens volens*, to give a new name to a plant that has probably already an old one. To guard against all future misconceptions of *Zamia Chigua*, I have given a figure of it from one of the plants in the Royal Botanic Gardens at Kew; and James Yates, Esq.,—who, at Lauderdale House, Highgate, cultivates the most extensive collection of *Cycadeæ* ever brought together in any garden, whether private or public, and who, with Brongniart, Miquel, and Lehmann, shares the supreme knowledge of this Order,—has favoured me with the following accurate description of it:—

"In 1847 Dr. Seemann sent three plants of *Zamia Chigua*, discovered by him in Darien, to the Royal Botanic Gardens at Kew. One died; another is, at the time I am taking these notes, in the great Palm-house; and the third, of which the following is a description, is in the Conservatory, No. 12, of that Institution, and is in a very healthy state:—*Stem* cylindrical, 20 centimetres high, viz. from the ground to the origin of the leaves, 40 c. in circumference, covered with the remains of old scales and bases of leaves. *Leaves* ten; length of the longest leaf, including the stalk, 1 metre, 20 c., the stalk being 20 c.; length of the shorter leaves, including the stalk, about 80 or 90 c. *Rachis*, including the stalk, round, enlarges into a callous pad at the base; above this pad it tapers continually till it becomes quite small, and terminates in a point extending beyond the leaflets; has two lateral channels, on which the leaflets are set, but not obliquely; covered, when first produced, with a short brown tomentum; muricate from the base of the stalk to within a short distance from the summit, with prickles numerous and thickly set near the base, diminishing in number as we approach the apex, and ceasing altogether in the upper part. Near the base these prickles are from 1 to 5 millimetres long, and are strong and sharp, and manifestly serve as a guard placed round the organs of fructification; towards the apex of the leaf the prickles are much shorter and blunter, as well as more rarely scattered. *Leaflets* neither alternate nor opposite, but in this respect irregularly disposed; in the longest leaf, sixty-six leaflets on each side, and no terminal leaflet; set nearly at right angles to the rachis; of a vivid green; nearly of the same length and size throughout the whole leaf, but rather shorter and smaller near the base; lanceolate and falcate; so close, that at their widest part, which is at a little distance from the base, they overlap; joined to the rachis by a distinct articulation, near which the leaflet is much contracted, so as to be semicircular; sixteen nervures at the widest part of the leaf, much less numerous at the base, but they bifurcate at different distances from the base, so as to amount to the number here stated; they are in general parallel and equidistant, nearly in straight lines, but conforming in some measure to the curvature of the upper and lower margin of the leaflet, yet only two of them continued quite to the apex of the leaflet; the rest terminating along its margin, and forming there a few teeth or notches so small as to be almost imperceptible, yet sufficient to establish a conformity in this respect between this species and the other species of the genus; but for these very slight notches, perceptible rather by the touch than the sight, the leaflet would be like that of *Ceratozamia*. *Male cone* nearly cylindrical, but converging suddenly into a conical form near the top,

and in like manner suddenly contracted near the bottom; the conical portion near the top not solid, but consisting of small abortive scales, irregularly shaped, and set closely together; beneath this part the scales are placed in columns, one scale exactly under another; their peltate terminations distinctly hexagonal; covered with a short brown tomentum. The plant now bears three male cones on strong thick peduncles. Largest cone with stalk 19 c. long, viz. stalk 6 c., cone 13, scales in twenty-one columns, each of thirty-two scales; circumference of cone at the thickest part 7½ c. Second cone 16 c. long, viz. stalk 5 c.; cone 11; scales in twenty columns, each of twenty-eight to thirty perfect scales, and about seven small and imperfect, forming the conical summit. Third cone 13 c. long, viz. stalk 4 c.; cone 9; eighteen columns, each of twenty-seven or twenty-eight perfect scales. Two of these cones are now preserved in fluid in the Museum at Kew. Instead of being on the under surface of the scale, the anthers are placed as shown in the plate, viz., two rows of anthers on each side of the scale, and generally four anthers in each row.

"March 8th, 1852.—The plant has two new cones, the larger 21 c. long without the stalk."

Plate XLIII. Fig. 1, male cone, natural size; 2, 3, and 4, scales; 5 and 6, anthers, magnified.

915. Zamia *pseudo-parasitica* (Yates, MSS.); caudice cylindrico, foliolis falcatis integerrimis glabris basi acutis apice cuspidatis, cono . . . Chagres, Province of Panama, growing epiphytically on trees (Warszewicz).

Mr. Yates has supplied the following note:—"*Zamia pseudo-parasitica*, Yates, MSS., so called because it grows on the trunks of trees, was sent from Chagres, by Mr. Warszewicz. The lower part of the stem was decayed, the upper alive, cylindrical, short, with remains of seven leaves; it was accompanied by six leaflets, which have no teeth at the extremity; on that account, I think it a little doubtful whether this is not a *Ceratozamia*. The leaflets are falcate, with a double curvature, so as to approach the form of the letter S. Length 35 c.; greatest width 4 c.; nervures broad and strong, twice bifurcate, terminating in the margin and apex."

916. Zamia *Skinneri*, Warsz. in Otto and Dietr. Gartenz. vol. xix. p. 146, cum icon. Cape Corrientes, Darien; Veraguas (Warszewicz).

"When I was at Berlin," says Mr. J. Yates, "in the autumn of 1850, I was informed that M. von Warszewicz, a Polish botanical traveller, had discovered two very remarkable species in the mountainous regions of the Isthmus of Panama, which he called *Zamia Lindleyi*, after Professor Lindley, and *Zamia Skinneri*, after Mr. G. Skinner, of Chipperfield House, King's Langley, Herts. When he was afterwards in London, I commissioned him to procure for me these species, or any others, which were new or remarkable. He sent me a stem of each of these, *Z. Lindleyi* and *Skinneri*, with the stem of another (*Z. pseudo-parasitica*). Each stem was accompanied with leaflets. They were put on board the steamer at the port of Chagres. When they arrived in London, consigned to Mr. Skinner, he found the *Z. Lindleyi* completely perished, 'a mere squash,' so that he could not lift it. The stem of the *Z. pseudo-parasitica* was also in great part rotten. The stem of the *Z. Skinneri* appears healthy. It is 30 c. long, 24 c. in circumference; twelve leaves have been cut away. I received with it five leaflets, much shattered, and the drawing which Warszewicz made of the plant on his former journey. This shows that there were twelve leaflets on a leaf. The following is the description of a leaflet taken from the largest:—Leaflet 33 c. long, 13 c. broad, ovato-lanceolate. A slender delicate nervure runs up each margin of the leaflet; between these two arise nine strong nervures united at the base, bifurcating a short way above the base, then bifurcating a second time, and some of them even a third time; after each bifurcation nearly parallel, and terminating in spines upon the upper and lower margins of the leaflet about two-thirds of the way down; the upper surface of the dried leaflet glistens and resembles cuticle. In those leaflets, which are

rotted and lacerated, this upper glittering surface may be cleared of the striæ, chlorophyll, and cells attached to it, and it then appears to be distinctly cuticle, like that of other leaves*.

PALMEÆ.

917. Euterpe *edulis*, Mart., Kunth, Enum. vol. iii. p. 179.—Nomen vernacul. "Maquenqui." Common in the Province of Panama, about Cruces, Gorgona, and San Juan, forming entire woods.

The leaves of this fine Palm are eaten by cattle; and the fruit, after having been boiled, is used as an article of food by the natives.

918. Iriartea *exorrhiza*, Mart., Kunth, Enum. vol. iii. p. 194.—Nomen vernacul. "Zanora." In woods of the Province of Panama, and the Territory of Darien.

The aerial roots of this Palm have much the appearance of the cylinders in musical boxes. They are used by the inhabitants as graters; and in a country where, from the humidity of the atmosphere, tin ones soon get rusty, those supplied by nature are by no means to be despised. I have often seen the people living on the river Chagres employing them when grating cocoa-nuts,—which, mixed and boiled with rice, is one of their favourite dishes. Sir E. Belcher, in his 'Narrative of the Voyage of H.M.S. Sulphur,' was the first who mentioned the preparation of this dish. "The stem of a spiny plant," to which he alludes there, are the aerial roots of this Palm.

919. Geonoma *simplicifrons*, Willd., Kunth, Enum. vol. iii. p. 231. In woods, Southern Darien.

920. Manicaria *saccifera*, Gærtn., Kunth, Enum. vol. iii. p. 234. Sea-shores of Southern Darien.

921. Thrinax *argentea*, Lodd., Kunth, Enum. vol. iii. p. 253.—Nomen vernacul. "Palma de escoba." In forests, growing as underwood.

This is the only Fan-Palm of the Isthmus hitherto discovered. From its leaves brooms are made.

922. Desmoncus *oxyacanthos*, Mart., Kunth, Enum. vol. iii. p. 260.—Nomen vernacul. "Matamba." On the outskirts of woods, climbing over shrubs and trees.

This Palm is occasionally used on festive occasions for making garlands.

923. Bactris *minor*, Jacq., Kunth, Enum. vol. iii. p. 267.—Nomina vernacul. "Corozo" et "Caña brava." In open places, seldom in woods.

Bactris sp.—Nomen vernacul. "Uavito." Common on the sea-coast, and covering the greater part of the Iguana Island, in the Bay of Panama.

924. Acrocomia *sclerocarpa*, Mart., Kunth, Enum. vol. iii. p. 271.—Nomen vernacul. "Chunga." In open places; never in dark forests; in the Province of Panama.

The fruit is acid, and eaten by the inhabitants.

925. Astrocaryum sp.—Nomen vernacul. "Pacuai." In dark forests, Province of Panama.

Stem from 24 to 30 feet high; leaves pinnated, from 8–10 feet long; fruit eatable.

* Whilst this sheet is going through the press, I have received some additional notes on *Zamia Skinneri*, Warsz., which will be found in the Supplement to this Flora.—*B. S.*

926. Attalea *Cohune*, Mart., Wlprs. Ann. vol. i. p. 1008.—Nomina vernacul. "Palma real" et "Corozo gallinazo." On dry ground, on hills, common in the Province of Panama.

Stem about 40 feet high; leaves pinnated, 30 feet, and each leaflet about 3 feet, long. From the stem palm wine is prepared; the unexpanded leaflets are used for wrapping up cakes of Indian corn (*tortillas*) previous to boiling them in water; the expanded leaves serve as thatch; from the fruit an oil is extracted.

927. Elais *melanococca*, Gærtn., Kunth, Enum. vol. iii. p. 279.—Nomen vernacul. "Corozo colorado." In swamps, and on the banks of rivulets, common in the woods all over the country.

The Palm is always found in swampy shady places, never on dry ground, or in sunny exposed positions. The caudex, which is short and thick, creeps along the ground, and has generally so very few roots, that it is not difficult to overturn a whole plant by a single kick of the foot. The leaves are 24 feet long; the fruit is red, hence the vernacular name "Corozo colorado." From it the inhabitants extract an oil, which is burned in their lamps. The fruit, after having been boiled, is stamped in a wooden mortar, until the sarcocarpium is separated from the putamen, and the oil is floating on the surface of the liquid mass thus produced.

928. Cocos *nucifera*, Linn., Kunth, Enum. vol. iii. p. 285.—Nomen vernacul. "Coco." Common on the sea-shores, both wild and in a cultivated state, but does not produce in the interior of the Isthmus any fruit.

Besides the Palms here enumerated, there are, according to the natives, several others in the neighbourhood of Portobelo; there is also one in Veraguas, called "Chonta," of which the Panama hammocks are partly manufactured.

PANDANEÆ.

929. Carludovica *palmata*, Ruiz et Pav., Kunth, Enum. vol. iii. p. 106.—Nomina vernacul. "Jipijape" et "Portorico." In half-shady places all over the country.

This species of *Carludovica* is distinguished from all others by being terrestrial, never climbing, and bearing fan-shaped leaves. The leaves are from six to fourteen feet high, and their lamina about four feet across. The flowers appear towards the end of the dry season, in February and March. In the Isthmus, the plant is called *Portorico*, and also *Jipijapa;* but the latter appellation is most common, and is diffused all along the coast as far as Peru and Chile, while in Ecuador a whole district derives its name from it. The *Jipijapa* is common in Panama and Darien, especially in half-shady places; but its geographical range is by no means confined to them. It is found all along the western shores of New Granada and Ecuador (Peru Alto); and I have noticed it even at Salango, where however it seems to reach its most southern limit, thus extending over twelve degrees of latitude, from the 10th north to the 2nd south. The Jipijapa, or Panama hats, are principally manufactured in Veraguas and Western Panama: not all, however, known in commerce by that name are plaited in the Isthmus; by far the greater proportion is made in Manta, Monte Christi, and other parts of Ecuador. The hats are worn almost in the whole American continent and the West Indies, and would probably be equally used in Europe, did not their high price, amounting often to 150 dollars for a single one, prevent their importation. They are distinguished from all others by consisting only of a single piece, and by their lightness and flexibility: they may be rolled up and put into the pocket without injury. In the rainy season they are apt to get black; but by washing them with soap and water, besmearing them with lime-juice or any other acid, and exposing them to the sun, their whiteness is easily restored. So little is known about these hats, that it may not be deemed out of place to insert here a notice of their manufacture. The "straw" (paja), previous to plaiting, has to go through

several processes. The leaves are gathered before they unfold, all their ribs and coarser veins removed, and the rest, without being separated from the base of the leaf, is reduced to shreds. After having been put in the sun for a day, and tied into a knot, the straw is immersed in boiling water until it becomes white. It is then hung up in a shady place, and subsequently bleached for two or three days. The straw is now ready for use, and in this state sent to different places, especially to Peru, where the Indians manufacture from it, besides hats, those beautiful cigar-cases, which fetch sometimes more than £6 apiece. The plaiting of the hats is done on a block, which is placed upon the knees; it commences at the crown, and finishes at the brim. According to the quality of the hats, more or less time is occupied in their completion: the coarser ones may be finished in two or three days, the finest take as many months. The best times for plaiting are the morning hours and the rainy season, when the air is moist: in the middle of the day and in dry clear weather, the straw is apt to break, which, when the hats are finished, is betrayed by knots, and much diminishes their value.

930. Carludovica *Plumierii*, Kunth, Enum. vol. iii. p. 106. Southern Darien, on trees.

931. Carludovica *angustifolia*, Ruiz et Pav., Kunth, Enum. vol. iii. p. 106.—On rocks on rivulets, Cape Corrientes, Darien.

932. Cyclanthus *bipartitus ?*, Poit., Kunth, Enum. vol. iii. p. 108. In shady places, banks of the river Pequeni, Province of Panama.

PHYTELEPHANTHEÆ.

Phytelephas.—*Char. Gen. emend. Flores* polygamo-dioici; masculi et fœminei, cum staminibus, quorum antheræ steriles, in distinctis spadicibus, spathis inclusis. *Spathæ* plurimæ, coriaceæ, longitudinaliter nervosæ, cylindricæ. Masc.:—*Spadix* specie simplex, cylindricus, pedunculo squamis nonnullis instructo, rhachi floribus densissime obtecto. *Flores* in prominentiis rhacheos brevibus (ramis decurtatis) arcte glomerati, bractea et calyce minimis sæpe delitescentibus. *Bractea* ovata, concava. *Sepala* tria: duo lateralia majora, bracteæ similia, tertium posticum illis tectum. *Stamina* numerosa (36), e thoro. *Filamenta* filiformia. *Antheræ* lineares, erectæ, fere basifixæ, biloculares, connectivo mucronulatæ. *Pollen* ellipticum, longitudinaliter sulcatum. Fœm.:—*Spadix* simplex, squamis compluribus spiratim dispositis obsessus, vertice flores nonnullos gerens, inter squamas abscondidos, qui constant pistillo et staminibus numerosis illud cingentibus, antheris sterilibus. *Ovarium* subglobosum, loculis 6–9. *Stylus* terminalis, erectus, apice tripartitus, cruribus subulatis, unico simplici rariusve bifido, binis bifidis, divisionibus intus stigmatosis. *Ovula* solitaria, sessilia, erecta, integumento duplici. *Drupæ* (6–7) in capitulum maximum ponderosum aggregatæ, depresso-globosæ, deorsum cuneato-angulatæ, subpentagonæ, muricato-tuberculatæ et maturæ crassocorticatæ, tuberculis sursum majoribus; longitudinaliter fibrosis et ex parte supra verticem fructus convergentibus; 6–9-loculares. *Semina* in loculis solitaria, e fructus angulis centralibus oblique adscendentia, hilo magno convexo cicatricoso, oblongo-obovata, introrsum bifacialia. *Testa* crassa, ossea, lævigata; membrana interna vasis ramosis percursa. *Albumen* osseum, solidum. *Embryo* periphericus, juxta hilum subbasilaris. *Germinatio* per chordam elongatam remotiva.—Plantæ *palmiformes;* caudice *mediocri, crasso, erecto vel decumbente.* Frondes *omnes terminales, magnæ, pinnatisectæ, segmentis reduplicatis, multinerviis et venis transversis conspicuis,* floribus *odoratissimis.*

933. Phytelephas *macrocarpa*, Ruiz et Pav. (Tab. XLV., XLVI., XLVII.), Humb. et Kunth, Nov. Gen. vol. i. p. 83!—Kunth, Enum. vol. iii. p. 109!—Mart. Palm. vol. iii. p. 306!—Hook.

Journ. of Bot. and Kew Misc. vol. i. p. 204!—Seem. Narrative of the Voyage of H.M.S. Herald, vol. ii. p. 222!—*Elephantusia macrocarpa,* Willd. Spec. vol. iv. p. 1156!—Nomina vernacul. "Marfil vegetal" et "Antá." Banks of rivers of Southern Darien, forming extensive groves by itself.

Those who deplore that the great geological convulsions which our planet had to undergo before the present order of things was established, deprived the New World of its ivory-bearing animals, and only suffered their remains to be preserved in the deposits ascribed to the drift period of our times, may derive some consolation from the fact that there still exists in the virgin forests of tropical America an ivory-bearing plant—the *Phytelephas macrocarpa*, Ruiz et Pav., producing a substance so exactly resembling to the eye the ivory obtained from elephants as to be frequently passed off for such, and even employed by mechanics, as far as its size will allow, in place of that article. When the Vegetable Ivory first came to be imported into Europe for commercial purposes has not yet been accurately ascertained; but there is reason to believe that it was shortly after the Spanish Colonies—its native country—obtained their independence (about the year 1826), as the narrow-minded commercial policy pursued by the Government of the Peninsula towards its dependencies proved an almost insurmountable obstacle to speculations in raw products, which, like the Vegetable Ivory, yielded but small pecuniary profits, and could therefore not be introduced into the market under a system the very opposite of that which, under the name of free-trade, has since caused such beneficial changes in commercial and international intercourse. Be that as it may, the Vegetable Ivory is now largely imported, chiefly from the river Magdalena, into Europe and the United States of America; but we are still uncertain to what amount, as we have no statistical information, both M'Culloch's 'Dictionary of Commerce' and Ure's 'Dictionary of Arts, Manufactures, etc.,' being silent on that point. Judging however from the use that is made of the article, the amount must be considerable. I know, from the inquiries instituted by Fred. Scheer, that in some years no less than 150 tons of it were imported into England; and that the "nuts" are shipped from the places where they grow in large quantities is evident from Purdie mentioning, in one of his letters to Sir W. J. Hooker ('Botanical Magazine' for 1847, Comp. p. 14):—"A few days ago (about the middle of February 1845) thirty tons of the 'nuts' arrived from the Magdalena (at Santamarta), commissioned for (the United States of) America and Germany." The "nuts" may be purchased in the toy-shops of the British metropolis for a few pence each, but when bought in large quantities they are obtainable at a very much cheaper rate; in August, 1854, one thousand nuts were sold in London for seven shillings and sixpence.

Long before the attention of commercial men was directed to the Vegetable Ivory, the existence of the plant producing it was known to botanists. It was during the latter part of the last century that two Spaniards, Ruiz and Pavon, gave, in their 'Systema Vegetabilium Floræ Peruvianæ et Chilensis,' published at Madrid in 1798, a scientific name (*Phytelephas macrocarpa*, R. et P.) to it, together with a brief description and a notice of its Peruvian names, and its properties and uses. The generic name (from φυτον, a plant, and ελεφας, an elephant) was certainly well chosen, and has ever since been retained in systematical works; unfortunately, the diagnosis attached to it was very imperfect, and that is the reason why the plant has to this day remained without a fixed station in the Natural System. A short time after the publication alluded to, Humboldt and Bonpland discovered the *Phytelephas macrocarpa* in New Granada, and collected some information concerning it, which however, useful as it proved in many respects, did not throw much light upon it in a systematic point of view. Nor did Gaudichaud's labours tend much to advance our knowledge in that direction. That botanist did not see the plant growing wild, and his three plates of it, published in the 'Partie Botanique, Voyage de la Bonite,' unaccompanied as they are by any explanatory description, are almost unintelligible, and moreover they show that he had extravagant notions respecting the species of which the genus *Phytelephas* is composed; he fancying that it was a congregate of no less than ten species, all of which he seems to have thought sufficiently characterized by the shape of the seeds,—a most variable organ in this instance. Purdie, acting upon instructions from the Royal Botanic Gardens at Kew, did a

great deal towards clearing the mist in which the Ivory plant had been so long enveloped. Writing to Sir W. J. Hooker from Ocaña, New Granada, July 20th, 1845, he says:—"At the village of Semaña, seventeen leagues from here, and near the great river Magdalena, I entered the mountains by the Paroquia del Carmen, and saw, for the first time, the Tagua, or Ivory plant (*Phytelephas*). Rising gradually between two ranges of mountains of great elevation, I reached Ocaña, which is situated on an undulated amphitheatre of bare grassy hills. I spent about a fortnight in the mountains of Ocaña. . . . Having received information that my baggage had arrived at Puerta Madonal de Ocaña, three days' journey from this place, I proceeded thither. I ascertained that the celebrated *Phytelephas* grew in this direction, and accordingly, one day after leaving Ocaña, and on my way to the Puerta, I found it at La Laguneta, a small settlement, and, being told that I should nowhere else have such good opportunity of collecting it, I spent some days there. The *Phytelephas* principally inhabits dense shady woods, facing the river Magdalena, at an elevation of 1000 to 3000 feet on the mountains. It is very graceful in aspect, and produces from fifteen to twenty pinnatisect leaves, which, when full grown, measure nearly twenty feet in length, and are of a delicate pale green colour. In old specimens the midrib of the leaves is flattened, but in young and fruit-bearing ones it is round. The plant is diœcious; the aspect of both sexes is the same. The male plant is distinguished by its spatha; the female plant produces none*, or it bursts and disappears at a very early stage of growth. The male flowers and spatha are produced from the axils of the inner leaves, and they incline outwards†. The singular heads of fertile inflorescence grow round the base of the plant, often six clusters at one time, and the heads rest on the ground, or are wedged between the leaves, and borne on a buried footstalk, the fibre of which is exceedingly tough. These clusters are of an imperfectly rounded form, covered with strong protuberances, about an inch and a half long, resembling styles. . . . On dissecting one of these compact heads, I found it to consist of many clusters‡, with three to five, commonly four seeds, compactly knitted together§. Hence the name of this plant, 'Cabeza de Negro,'—by no means an inapt comparison, for the style-like projections resemble a black man's rigid hair. The styles contract to a point, tipped by a stigma, four or five inches long, and are again divided in as many points as there are cavities in the clusters. At a very early stage, these hollows are filled with a watery fluid, of a sweetish taste, which lessens in quantity with the advancing state of the fruit."

In a subsequent communication to Sir W. J. Hooker, dated Santa Ana, near Honda, April 18th, 1846, Purdie announces his discovery of the male flowers. He says:—"I have had the good fortune to detect the male flower, for which I long sought in vain. The singularity of this inflorescence is only equalled by its beauty. It has a double spatha; the central column is thickly set with clusters of male blossoms, and forms, when taken altogether, a mass three feet long and four inches thick. Half is concealed within the spatha, from which the other portion projects in a graceful recurved form. The fragrance is most powerful and delicious, beyond that of any other plant, and so diffuse, that the air, for many yards around, was alive with myriads of annoying insects, which first attracted my notice: the closeness of the forests not permitting me to discern the blossom at any distance. I had afterwards to carry the inflorescence in my hands for twelve miles; and though I killed a number of insects that followed me, the next day a great many still hovered about it, which had come along with it from the wood where it grew." (Purdie, in 'Botanical Magazine' for 1847, Comp. p. 14 seq.)

In 1848, Martius, towards the end of his famous work on Palms, gave, partly from Gaudichaud's figures, partly from imperfect specimens in his possession, a generic character of *Phytelephas* (Mart., Hist. Nat. Palmarum, vol. iii. p. 306), which greatly tended to place the organization of this remarkable plant

* This is not the fact.—*B. S.*

† All this refers to the female flowers; the male flowers Purdie does not appear to have seen until afterwards.—*B. S.*

‡ There are generally seven.—*B. S.*

§ Purdie's specimens in the Kew Museum show that there are generally from six to seven.—*B. S.*

in a clearer light. Morren (Dodonæa, vol. iii. part ii. p. 74) also wrote some valuable remarks on the seeds of it. In 1849, Sir W. J. Hooker contributed his share towards the perfection of our knowledge of *Phytelephas*. In an able article, published in 'Hooker's Journal of Botany and Kew Garden Misc.' vol. i. p. 204, he reproduced not only the pith of nearly all that had been written upon the subject, by Ruiz and Pavon, Humboldt and Bonpland, Purdie, Martius, and Morren, but also added some valuable observations of his own, as well as a detailed description of the fruit and seed; and, availing himself of the services of Mr. W. Fitch, he illustrated his paper with two plates, the one representing a view of a grove of Ivory plants on the banks of the Magdalena (from a sketch of Edward Mark), the other, the fruit, seed, and several toys made from the albumen. For want of perfect specimens of the flowers that author was unable to confirm the accuracy of Martius' description of those organs, or supply the deficiencies which the latter, from similar causes, was compelled to admit in his generic character.

In December 1847, whilst ascending the river Cupica, I had the good fortune to fall in with the Ivory plant, and afterwards met with it in various other parts of Darien. A selection from the notes taken on those occasions was subsequently published (Hooker's Journal of Botany and Kew Gard. Misc. vol. iii. p. 303, and 'Narrative of the Voyage of H.M.S. Herald,' vol. i. p. 222). It contained a general description of the plant, and dwelt upon the close relationship of *Phytelephas* with *Pandaneæ*. Since then there has not been, so far as I know, any additional information given to the world; and it only remains for me to draw up an account of this remarkable production, as perfect as the various materials, published and unpublished, at my disposal, will permit.

The Ivory plant is confined to the continent of South America, where it grows between the 9th degree of north, and the 8th of south latitude, and the 70th and 79th of west longitude. It inhabits damp localities, such as confined valleys, banks of rivers and rivulets, and is found not only on the lower coast region, as in Darien, but also on mountains at an elevation of more than 3000 feet above the sea, as in Ocaña. Amongst the Spaniards and their descendants it is known by the name of "Palma de marfil" (Ivory Palm), whilst its fruit is called by them "Cabeza de Negro" (Negro's head), and its seed "Marfil vegetal" (vegetable ivory). The Indians on the banks of the Magdalena term the plant "Tagua," those on the coast of Darien "Antá," and those in the Peru "Pullipunta" and "Homero*." It is generally found in separate groves, seldom intermixed with other trees or shrubs, and where even herbs are rarely met with, the ground appearing as if it had been swept. The trunk is always pulled down, partly by its own weight, partly by its aerialroots; and thus forms a creeping caudex, which is frequently twenty feet long, but is seldom higher than six feet. The top is crowned with from twelve to twenty pinnatisect leaves, the entire length of which is from eighteen to twenty feet. The segments are towards the base of the leaf alternate, towards the apex opposite: they are three feet long, two inches broad, and their entire number amounts generally to 160. All the plants which I saw were diœcious, the males always being more robust, and their trunks more erect and higher, than the females. The inflorescence of both emits a most penetrating almond-like smell. The inflorescence of the male plant is a simple, fleshy, cylindrical spadix, which has three or four spathes, the flowers of which are densely crowded together, and sessile. They are generally furnished with a small bract, and a calyx consisting of three sepals. The stamens are numerous (thirty-six), the filaments filiform, the anthers linear, erect, affixed nearly at the base, and bilocular; the con-

* At the Great Industrial Exhibition in Hyde Park, the nuts were exhibited by R. Fauntleroy and Sons, sub Class 4, No. 135, under the names of "Corozo" or "Corusco;" and Archer (Popular Economic Botany, p. 296, 1st edit.) says: "How these names originated is a mystery, as the Indians call the Palm by the names Pullipunta and Homero." It is indeed a mystery; but not *as* the Indians call the Palm "Pullipunta" and "Homero" (for those appellations are only used in very limited districts), but as the name "Corozo," of which Corusco is evidently a corruption, is generally confined to certain oil-palms, of the central parts of America, belonging to the genera *Attalea*, *Elais*, and *Bactris*.—*B. S.*

nective is mucronulate, and the pollen elliptical and furrowed lengthways. The inflorescence of the female plant has three or four spathes, and consists of a simple spadix bearing on an average from six to seven flowers, which form a dense cluster, and are surrounded by bracts, placed in a spiral direction, the uppermost five of which, being often much longer than the style, but generally shorter, and pure white, have the appearance of petals; the stamens are numerous, free, sterile, inserted in the torus between the petaloid bracts and the ovary. The ovary is from six- to nine-celled, each cell containing a solitary, sessile, erect ovule, attached to an axile placenta. The style is elongated, splitting into six, seven, eight, or nine branches, stigmatose on the edges. The fruit, a collection of from six to seven drupes, forms clusters, which are as large as a man's head, and stands at first erect, but when approaching maturity—its weight increasing, and the leaf-stalk, which, having up to that period supported the bulky mass, having rotted away—it hangs down. A plant bears at one time from six to eight of these heads, each weighing, when ripe, about twenty-five pounds. The drupes are covered outside with hard woody protuberances, formed in the same manner as those of the trunk of *Testudinaria Elephanthipes*. Each drupe contains from six to nine seeds, but generally seven. The testa is thick, bony; the embryo peripherical, and placed near the hilum.

Morren ('Dodonæa, ou Recueil d'Observations de Botanique,' vol. i. part ii. page 74) has made the following observations on the seeds:—"The external covering of the seed is so hard as to be almost stony, yellowish-grey, smooth, and destitute of gloss: it is attached to a second coating, which is brown, porous, and dull, and is incorporated with it. Beneath a hollow, which separates these two integuments, is a third, brown, veined, warted, and glossy covering, traversed by numerous fibres, under which lies the albumen, which forms the Vegetable Ivory. The Vegetable Ivory is of the purest white, and free from veins, dots, or vessels of any kind, presenting a perfect uniformity of texture, surpassing the finest animal ivory; and its substance is everywhere so hard, that the slightest streaks from the turning-lathe are observable, and cannot be erased till it is newly fashioned. When the article is carved, the Vegetable Ivory may be known by its brightness, and by its fatty appearance, whereon the well-skilled may discern the minute lines which are the beds of cells. Its structure would almost seem to show more analogy with bone than with ivory; but a microscopic investigation quickly proves that Vegetable Ivory possesses an entirely different structure. This structure is among the most curious in the vegetable kingdom. The external covering of the albumen is composed, as we proceed from the outside to the inside, of—1. A layer of ovoid cellules, with brown thick parietes; the elongated centre of each cellule is filled with a darker substance. 2. A second layer of ovoid cells, placed perpendicularly on the first, but with the innermost elongated, and approximating towards the structure of the next layer. 3. A third layer of cells, still more elongated and fusiform; their parietes are thick and brown. 4. A fourth layer of smaller and prismatic cells, placed perpendicularly and regularly over the preceding layer: they rest in turn upon the last, which is—5. A final layer of very dark and irregular cells, externally coated, on the side towards the albumen, with a brown colouring matter, which imparts its hue to the surface of the albumen, or Vegetable Ivory." All the above-described organization belongs only to the integumentary system. "The albumen, or Vegetable Ivory itself, is composed of concentric layers, of which only the most external differ from the most internal. When the albumen is hard, as was that which I examined, it presents a white substance, transparent in water, and which appears continuous, and not to be distinguished into various degrees of growth. It is perforated with an infinity of holes, the sections of so many cavities; the latter are irregularly rounded, and also prolonged into arms or tubes, which give a starry appearance to the cavities, many of them being five, six, seven, eight, and ten rayed. Here and there may be seen a little spheroidal cavity; finally the tubes appear to be each tipped with a small swollen head. Throughout the albumen the above-described structure is more or less regular, offering a beautiful study to the vegetable anatomist.

"Generally speaking, the starry cavities are arranged in a quincunx, so that the interval between two of

them corresponds to a third. A little attention also enables the observer to see that those rays which are terminated by a little head answer always to one another. The space between these heads is largest in a dry slice, and least in a moist one. The central cavity is sometimes empty, and sometimes filled with a substance composed of very minute globules, reaching occasionally to the very tips of the rays. It is evident that these starry cavities represent so many hollows of cells, which still preserve their radii of communication, though the primitive parietes are obliterated; and in some instances the cavities only remain in the form of ovoidal cells, which still can be restored to their original configuration by immersing the portion of albumen in Canada balsam. I have dried a carefully-cut slice of the ivory, and then subjected it to the influence of Canada balsam, which rendered it so perfectly diaphanous as to be scarcely discernible by the naked eye from the balsam. This process has the effect of restoring the cells to their normal structure: they become six-rayed, the tubes correspond exactly with each other, and every one is tipped with a swollen head, and more or less filled with the globular substance of which I have spoken. Thus we see revealed the whole organization of Vegetable Ivory, which is merely a prismenchyme with thickened cells, in which the rays of communication are preserved. The closest scrutiny has not enabled me to detect, in the thick portion of the cells, the smallest trace of those layers of growth which have been detected by Valentin, especially in the *Hoya carnosa* and *Oreodoxa regia*, etc. This substance, which appears continuous, is very analogous to that which Schleiden and Theodore Vogel, in their researches into the nature of the albumen, have found in the albumen of *Phœnix dactylifera;* only that in the latter there is no starry disposition of the tubes, and the hollows of the cells are elongated into two, or, at most, into three, radii of communication." Morren has well observed, at page 72, "L'ivoire qu'on retire de ces graines n'est autre chose que l'albumen, qui de laiteux, qu'il était d'abord, d'albumineux qu'il était ensuite, a fini par acquérir la consistence du blanc d'amande, pour passer enfin à l'état dur, élastique, et blanc, qui l'a fait comparer à l'ivoire."

"It is a no less curious fact," says Sir W. J. Hooker ('Hooker's Journal of Botany,' vol. i. p. 211), that this hard eburneous mass again reverts to its former soft state in the process of germination. This I have frequently had the opportunity of witnessing. Our seeds were mostly sown in pots, one in each pot, and buried two inches or more under the earth. The first symptom of vitality became apparent by the protrusion of a strong stout fibre, which quickly took a downward direction, and, elongating some inches, produced from the opposite extremity a new plant, which soon developed itself in the air, while from its base the true roots descended (see Plate XLV. fig. 8). Gradually the seed, so recently buried, emerged to the surface, there lying on the earth; or, more frequently, it was forced out of the pot, hanging over the edges, and suspended by the strong fibre before alluded to; which thus forms a medium of communication, by its vessels, between the seed and the very base of the young plants (the collum), or point of junction of the root and stem. The seed was broken at this time, and the inside found to have become a soft substance, half pulp and half milk, which feeds the young plant, until it is old enough to derive its nutriment wholly from the soil, viz., when the plant is a year or more old. If the seed be then tapped with a hard instrument, its sound will indicate its emptiness; and the fracture of the old shell (testa) will exhibit nothing in the interior but a half-dried pulp, lining the inner integument of the seed. Henceforward, the plant depends upon the soil for its nourishment."

In habit, the *Phytelephas macrocarpa* resembles the *Corozo colorado* (*Elais melanococca*, Gærtn.); so much so indeed, that at first sight the two are easily mistaken for each other. Both have trunks which, after creeping along the ground a few yards, ascend, and attain about an equal height. Their leaves also resemble each other; and their fruit grows in a similar way, attached to comparatively short peduncles. The habit, however, is nearly the only link which connects *Phytelephas* with the order of Palms: its simple spadix, its imperfect flower, its indefinite number of stamens, and its embryo situated in the axis of a fleshy albumen, separate it from Palms, and proclaim it (in conjunction with other characters which it presents) a member of Endlicher's Class *Spadicifloræ*, and Lindley's Alliance *Arales*. Botanists enumerate

four Orders as belonging to that great division (*Pistiaceæ*, *Typhaceæ*, *Aroideæ*, and *Pandaneæ*). To *Pistiaceæ* it cannot belong, because (leaving habitual differences out of consideration) it has an axile placentation. Amongst *Typhaceæ* it cannot be placed, because it has a multiovular ovary. With *Aroideæ* it cannot be associated, because it has a drupaceous fruit; and with *Pandaneæ* (including *Cyrtantheæ*) it cannot be joined, because it has an axile placentation. Repelled by these and other considerations from placing it with any of the Natural Orders above mentioned, and finding it impossible to trace out any relationship of it with any other group of plants besides the *Spadicifloræ*, we are compelled to adopt the views of Martius, who looks upon it as the type of a new Natural Order (*Phytelephantheæ*).

The uses of the Ivory-plant may, as far as they are known, be summed up in a few words. The Indians cover their cottages with the leaves of it; but this is only done when those of Palms are not procurable, as the latter last much longer than the former. The seed at first contains a clear insipid fluid, with which travellers allay their thirst; afterwards, this same liquor becomes milky and sweet, and it changes its taste by degrees as it acquires solidity, until at last it is almost as hard as ivory. The liquor contained in the young fruits turns acid if they are cut from the tree and kept some time. From the kernels (albumen) the American Indians as well as European turners fashion the knobs of walking-sticks, the reels of spindles, and little toys, which are whiter than animal ivory, and equally hard, if they are not put under water; and if they are, they become white and hard when dried again. Bears, hogs, and turkeys, devour the young fruit with avidity. Purdie says:—"Enclosing the seeds is a yellow, sweet, oily pulp, which is collected at the proper season (October), and sold under the name of *Pipa de Tagua*, for one real a pound at Ocaña; a spoonful of it with a little sugar and water, makes the celebrated *Chicha de Tagua*, said to be the most delicious beverage of New Granada." This statement is difficult to reconcile with the internal organization of the fruit, and requires some emendations. Purdie wrote the letter in which it is contained in July, 1845, after he first saw the Ivory-plant, when he could not know, from personal experience, what took place in October following. He must have gathered it, therefore, from information obtained from the native inhabitants, who, not being versed in botanical terminology, might easily have made a mistake. The "yellow, sweet, oily pulp" can, in my opinion, be nothing save the second state into which the albumen enters, previous to its becoming solid; and I am the more inclined to think that this opinion is correct, as it is borne out to a certain extent by analogy. For in the Isthmus of Panama, and other localities of New Granada, the name of *Pipa* is applied to a beverage prepared from the young albumen of cocoa-nuts, and in a similar way as that described by Purdie. The same author proceeds:—"It has, however, a slightly drastic property. Although this substance contains much oil, it never becomes rancid by keeping, but at the end of nine months it preserves, in a crude state, all its flavour and quality."

Plate XLV. Fig. 1, male plant; 2, female plant, *both reduced;* 3, section of the portion of the leaves, *natural size;* 4, albumen, *entire;* 5, transverse section of the same, *both natural size;* 6 and 7, embryo, *slig htly magnified;* 8, a young plant, *natural size.*

Plates XLVI. and XLVII. (a double plate.) Fig. 1, portion of male spike, *natural size;* 2, stamens, *magnified;* 3, female flowers, *natural size;* 4, ovary and portion of the style, *slightly magnified;* 5 and 6, different views of the ovary, *slightly magnified;* 7, a head of the immature fruit; 8, a head of the ripe fruit; 9, portion of the fruit (the three last represented in their *natural size*).

AROIDEÆ.

934. Colocasia *esculenta*, Schott, Kunth, Enum. vol. iii. p. 37.—*Arum esculentum*, Linn. Syst. Veg. (edit. Pers.), p. 872.—*C. antiquorum*, Schott?—Nomen vernacul. "Otó." Cultivated in fields for the sake of its esculent tubers.

The Otó is in the Isthmus always cultivated in fields, in dry grounds, never in swamps, as is generally

the case in the Sandwich Islands, where, under the name of Kalo,—not Taro, as the Hawaiian language has neither a *t* nor an *r*,—it forms the chief portion of the food of the aboriginal inhabitants of that country. In the Isthmus, where the Yam, the Sweet Potato, the Cassava, and other esculent tubers, succeed well and are much eaten, the Otó is not very extensively grown, and does not form a large article of consumption. In the Isthmus it is solely cultivated for the sake of its tubers (or rather tuberous rhizomes), but in the Sandwich Islands it is also grown on account of its leaves, which, having been baked underground on hot stones, by the process so well described by the old voyagers, and having thus been deprived of acridity, are eaten, and taste in that state something like our spinach. As is the case with most vegetables long attended by man, a great many varieties exist, distinguished from each other by the colour of the rhizomes and foliage, as well as by the height of the entire plant and the shape of the leaves. Whilst in the Sandwich Islands I paid some attention to them, which led me to the conclusion that though all the different varieties of this plant might, like our apples, pears, or potatoes, be defined for horticultural purposes, yet that the whole of them may, for all botanical ends, be classed under three heads, viz.:—

C. esculenta, Schott, var. *α*, *alba*, Seem. Rhizomes, petioles, ribs, and veins of the leaves, white.

C. esculenta, Schott, *β*, *flavida*, Seem. Rhizomes, ribs, and veins of the leaves, yellowish.

C. esculenta, Schott, *γ*, *purpurascens*, Seem. Rhizomes, petioles, ribs, and veins of the leaves, more or less tinged with a purplish colour. This last variety is considered the best of the three by the Hawaiians; and the tribute of Kalos, which the lower classes of the Sandwich Islands were compelled to pay to their chiefs, was always understood to be discharged in it.

935. Philodendron *lacerum*, Schott, Kunth, Enum. vol. iii. p. 50. Climbing on trees; island of Taboga, and neighbourhood of Panama.

936. Monstera *cannæfolia*, Schott, Kunth, Enum. vol. iii. p. 61. In open places, generally on the banks of rivers, Province of Panama and Territory of Darien.

937. Anthurium *violaceum*, Schott, Kunth, Enum. vol. iii. p. 67. Bay of Cupica, Darien.

938. Anthurium *Hookeri*, Schott, Kunth, Enum. vol. iii. p. 74. Chagres (Fendler).

Several other *Aroideæ*, besides those enumerated here, were collected by Fendler at Chagres; and I noticed an additional species, called *Otó cimarron* or *Otó de alagarto* by the natives (perhaps a *Caladium*) in swampy places of the woods.

PISTIACEÆ.

This Natural Order was associated by most authors either with *Lemnaceæ* or *Aroideæ*, until Klotzsch assigned to it, in his monograph on *Pistia* (Über Pistia; Berlin, 1854), an independent station among Endlicher's *Spadicifloræ*, separated from it upon the advice of Schott, *Ambrosina* (which forms a tribe of the true *Aroideaceæ*), and confirmed the position of *Lemna* amongst *Fluviales*.

939. Pistia *Stratiotes*, Linn. Zeyl. no. 322. In swamps, common about the city of Panama.

Klotzsch has divided the old genus *Pistia* into three genera (*Apiospermum*, *Limnonesis*, and *Pistia*), and twenty species. This view not having as yet been generally adopted by botanists, I may be permitted to retain the old name for this variable water-plant, especially as I myself entertain some doubts whether this extreme division of the genus is a natural one. I have no materials to test the two new genera, but, accepting *Pistia* proper, as now circumscribed by Klotzsch as correct, and confining myself to that, I must confess that the seventeen species ranged under that genus, appear to me to possess no characters upon which a botanist of the school to which I belong would be inclined to lay any stress. The leaves vary in

one and the same individual plant so much, in their shape, number of veins, degree of hairiness, and colour, that no specific characters can possibly be derived from them; and as for the female perigonal scale, upon which Klotzsch insists as an important specific character, that amounts, as far as I am able to judge, to very little indeed. In the first place, Klotzsch only describes that scale in the diagnoses of two species of *Pistia*, and in the second the actual distinction between these two consists in this:—in one so-called species it is bilobed, and in the other cordate at the base: as a cordate shape is only one in which the two lobes are shorter than in the bilobed form, it follows that even this character is merely a relative, not an absolute one, and consequently of little specific importance.

NAJADEÆ.

940. Potamogeton *pectinatus*, Linn., Kunth, Enum. vol. iii. p. 137. Stagnant waters near Panama.

CANNACEÆ.

941. Thalia *geniculata*, Linn. Syst. Veg. (ed. Pers.) p. 51. In swamps from Chagres (Fendler, no. 338) to Panama.

942. Maranta *arundinacea*, Linn. Syst. Veget. (ed. Pers.) p. 50. In sunny places, about Panama.

MUSACEÆ.

943. Heliconia *psittacorum*, Linn. Syst. Veg. (ed. Pers.) p. 257. In shady places, from Chagres (Fendler) to Panama.

944. Musa *paradisiaca*, Linn. Syst. Veg. (ed. Pers.) p. 942.—Nomen vernacul. "Platano." Extensively cultivated for the sake of its fruit.

945. Musa *sapientum*, Linn. Syst. Veg. (ed. Pers.) p. 943.—Nomina vernacul. "Banana" et "Guineo." Cultivated on a large scale on account of its edible fruit.

The question whether the Plantain and its kindred are indigenous or not to the New World has hitherto formed a topic of discussion for historians rather than for naturalists, and no satisfactory conclusion has as yet been arrived at. Some incline to the former, others to the latter opinion; and again, a third party thinks, that while some species are indigenous, others have been introduced from other quarters of the globe. Robertson, following Wafer and Gumilla, classes the Plantain among the native productions of America, because it was found by the latter two authors far in the interior of that continent, and in the hands of Indians who had little or no communication with the Spanish Creoles. But as both Wafer and Gumilla travelled a number of years after Columbus's discovery, and as we know that many plants, even some less useful than the different Musas, were disseminated with the utmost rapidity over the territories of the New World, the proofs adduced by the great Scotch historian are insufficient. Prescott seems to look upon the Plantain as introduced, but thinks that it is not mentioned in the works of Hernandez. Yet Hernandez does mention the Plantain; he even informs us that it was brought to Mexico from foreign parts, as will be seen from the following account, transcribed from his Hist. Plant. Nov. Hispan. Libr. vol. iii. p. 172.—"Arbor est mediocris, familiaris calidis regionibus hujus novæ Hispaniæ, vocatur a quibusdam recentiorum *Musa*. Folia sunt valde longa et lata, adeo ut hominis superent sæpenumero magnitudinem; fructus racematim dependent incredibili numero et magnitudine, cucumerum crassorum et brevem forma,

dulces, molles atque temperiei proximi, nec ingrata nutrimenti. Eduntur hi crudi assive ex vino, atque ita sunt gustui jucundigris. Differt fructus magnitudine, et quo minores sunt, eo salubriores et suaviores. (By the smaller one he means the Bananas.) Advenam esse aiunt huic novæ Hispaniæ atque translatam ab Æthiopibus aut Orientalibus Indiis, quorum est alumna. Caulis et radix, quæ fibrata est, multis constant membranis, saporis expertibus et odoris, lubricis et frigescentibus, ex quo facile quis conjiciat, quibus morbis possint esse utiles." Conclusive as is this statement, both as regards the identity of the plant, and its native country, still some may yet entertain doubts, as Hernandez wrote, not at the time of the discovery of America, but towards the end of the sixteenth century. There is however another proof that the Plantain was introduced. Neither the Quichua nor the Aztec, the two most refined of all American languages, nor indeed any other indigenous tongue of the New World, possesses a vernacular name for this plant. Even Hernandez, who collected the Aztec names with the utmost care, could find none, and was compelled to place, in his great work, the Plantain near the Quauhxilotl (*Parmentiera edulis*, De Cand.), and call it *Quauhxilotl altera;* the cucumber-like fruit of the *Parmentiera* appearing to him to form the closest approach to that of the *Musa*.

ORCHIDEÆ.

(*Auctore H. G. Reichenbach fil.*)

946. Habenariæ sp. fructifera. Panama, 319.

947. Stenorrhynchus *speciosus,* Rich. Panama (sine num.).

948. Vanilla *Pompona,* Schiede?; folia desunt. Eosdem flores teneo ab indefesso De Warszewicz. Folia contra sine floribus ex Segovia attulit cl. Œrsted, quæ illis Vanillæ Pomponeæ spontaneæ prope duplo majora, 8–9 pollices longa, 4 in medio lata, valde sunt insignia. Nostra: Panama, 1159.

949. Sobralia *Fenzliana,* Rchb. fil., Bot. Zeit. 1852. p. 714. Panama, on trees.

950. Oncidium *altissimum,* Smith. On trees, all over the country.

951. Oncidium *ampliatum,* Lindl. Panama, on trees.

952. Rodriguezia *secunda,* H. B. K. Panama, on trees.

953. Trigonidium *Seemanni,* Rchb. fil.; pedunculo prope pedali subflexuoso pluri(7)vaginato, vaginis arctis apicibus in basibus superioribus imbricantibus, sepalo summo a basi ligulato-cuneata dimidio superiori abrupte ovali acuto, sepalis lateralibus cuneato-oblongis acutis, apice reflexis, tepalis ligulatis acutis, basi attenuatis, apice (ex lateribus involutis) cucullato-incrassatis, quam sepala dimidio brevioribus, quintam illorum latitudinis partem æquantibus, labello ligulato trilobato, lobo medio subcordato acutiusculo, per totam paginam callosulo, lateribus suis posticis incisuras loborum lateralium tegente, lobis lateralibus retusissimis incisuris illis minutis efformatis, nervis labelli mediis longitudinaliter carinulato-incrassatis, gynostemio postice apice acuto, anthera . . .—Sepalo supremo, petalis ac labello recedit ab affinibus *T. obtuso,* Lindl., ac *T. Egertoniano,* Bat. Hujus tamen descriptio valde manca. Speciem insignem indefesso cl. Seemann dicavi. Rara videtur, cum inter copiam Orchidearum centro-americanarum, quam teneo, haud amplius occurrat. Panama, 539.

954. Maxillaria (Xylobium) *Stachyobiorum,* Rchb. fil., B. Zeit. 1852. p. 735. Panama.

955. Epidendrum (Aulizeum) *cycnostalix*, Rchb. fil., B. Zeit. 1852. p. 731. Neglectis bracteis, foliis ac inflorescentia ex pseudobulbo orta, pro *Epidendro Stamfordiano*, Bat., facile habebis. Panama.

956. Epidendrum (Amphiglottium) *radicans*, Pav. Panama.

957. Brassavola *venosa*, Lindl. Nomen vernacul. "Dama de noche." Panama, Icon. (Androclinium haud vidi).

"Highly esteemed by the inhabitants on account of its nocturnal fragrance."—*B. Seemann.*

958. Bletia *florida*, R. Br. In Savanas, Veraguas.

959. Hexadesmia *micrantha*, Lindl. Panama.

960. Schomburgkia *undulata*, Lindl. Veraguas.

961. Pleurothallis (Muscosæ) *perpusilla*, Rchb. fil. MSS.; caulibus secundariis brevissimis a squamis hyalinis 2–3 vestitis, folio spathulato basi valde et longe attenuato apice rotundato obtuse minuteque tridentato, pedunculo capillari folium duplo–triplo excedente, minute bivaginato, vaginis ochreatis acutis, racemo 6–8-floro, bracteis ochreatis acutis, pedicellis brevioribus, sepalis oblongis acutis, tepalis lineari-lanceolatis acutis, brevioribus, labello oblongo, excavato, apice acuto solido inflexo, inferne carinato, gynostemio abbreviato utrinque rotundato alato, ab anguli apice ad medium, postice unidentato, in labellum incumbente (!!), anthera mitrata.—Plantula tenuissima, bipollicaris. Flores minutissimi. Near Panama, on trees. Seemann, no. 1565.

962. Selenipedium *Hartwegii*, Rchb. fil.—*Cypripedium Hartwegii*, Rchb. fil. Bot. Zeit. 1852. pp. 714, 765 (Tab. XLIV.). Adde: foliis ligulatis apicem versus valde attenuatis, prope tripedalibus. Darien, on the sea-coast. (Seem. no. 1114.)

Plate XLIV., Figs. 1 and 2, views of the column:—*both magnified.*

963. Selenipedium *Chica*, Rchb. fil., Bonplandia, vol. ii. p. 116.—Nomen vernacul. "Vainilla chica." In dark woods, in the Provinces of Panama and Veraguas.

"The fruit of this plant is highly esteemed as an aromatic by the inhabitants of the Isthmus, and used for all purposes for which real Vanilla is commonly used. It is termed Vainilla Chica, or "little Vanilla," because its fruit is very much smaller than that of any species of the genus Vanilla found in the Isthmus."—*B. Seemann.*

Besides the *Orchideæ* here enumerated, Dr. Reichenbach has described, in 'Bonplandia' vol. ii., a considerable number of new ones from the collections made by Warszewicz in various parts of Panama and Veraguas; Dr. Lindley also has given, in Hooker's 'Journal of Botany,' vol. i., a list of *Orchideæ* gathered by Cuming at Panama, and he has besides published in his 'Folia Orchidacea' several species found by Warszewicz in Veraguas.—*B. Seemann.*

BROMELIACEÆ.

964. Ananassa *sativa*, Lindl., Bot. Reg. no. 1068. t. 1081.—Nomen vernacul. "Piña." Cultivated extensively on account of its fruit, but also found apparently wild in various parts of the country, generally in dry localities on the outskirts of woods.

The Pine-apple was among the first plants which Columbus met with on landing in Northern Veraguas, where it was extensively used by the Indians. It may have been brought to the country at a very early

period of history; but the fact that it was met with in the Isthmus on the arrival of the first European, together with the circumstance that it grows to all appearance wild in various parts of the country, may be looked upon as almost conclusive proofs of its being indigenous.

965. Bromelia *Pinguin*, Linn., Syst. Veg. (ed. Pers.) p. 332.—Nomen vernacul. "Piñuella." Common in dry sunny localities, and used along with *Opuntiæ* and *Cerei* for making hedges.

966. Bromelia *Karatas*, Linn., Syst. Veg. (ed. Pers.) p. 332?—Nomen vernacul. "Pita de zapateros." In dark woods all over the Isthmus, and, like the two foregoing species, terrestrial.

The leaves of this plant furnish a strong fibre, which is procured by a similar process to that of our flax, and is extensively used by the shoemakers of the Isthmus for sewing.

967. Puya *heterophylla*, Lindl., Bot. Reg. 1840. t. lxxi. On the trunks of trees; David, Veraguas.

Flowers either white, or more or less red.

968. Tillandsia *pulchra*, Hook., Exotic Flora, t. 154. On trees, about Panama.

969. Tillandsia *disticha*, Humb. et Kunth, Schult. Syst. vol. vi. p. 1218. About Panama (Cuming).

970. Guzmannia *tricolor*, Ruiz et Pav., Schult. Syst. vol. vi. p. 1231. Chagres (Fendler).

The specimen is in fruit only.

AMARYLLIDEÆ.

971. Eucrosia *bicolor*, Ker., Kth. Sp. Plant. vol. v. p. 504. In the woods of Southern Darien.

972. Fourcroya *gigantea*, Vent., Kth. Sp. Plant. vol. v. p. 841. Island of Cacagual, Darien.

973. Fourcroya *tuberosa*, Ait., Kth. Sp. Plant. vol. v. p. 842.—*Agave tuberosa*, Mill., Dict. ed. 8. no. 4 (excl. Commel.).—Nomen vernacul. "Cabuya." On the slopes of the volcano of Chiriqui, Veraguas, but also cultivated to a considerable extent, on account of its fibre.

The fibre of the leaves is very strong, and used for making ropes and hammocks.

974. Polyanthes *tuberosa*, Linn., Kth. Sp. Plant. vol. v. p. 846.—Nomen vernacul. "Margarita olorosa." Cultivated in gardens, on account of its fragrant flowers.

IRIDEÆ.

975. Sisyrinchium sp. aff. *S. iridifolio*. Savanas about Panama.

There is only a single specimen of this species, which is quite glabrous, and has whitish flowers. It may perhaps be a smooth variety of *S. iridifolium*, H. B. K.

DIOSCORINEÆ.

976. Dioscorea *macrostachya*, Benth., Plant. Hartw. p. 73.—*D. macrophylla*, Mart. et Gall.,

Enum. Synop. Pl. Mex. 21!—*D. Deppii*, Schlecht., Linnæa 1843. p. 602!—*D. Billbergiana*, Kunth, Sp. Plant. vol. v. p. 354.—*Testudinaria Mexicana*, Hort. Angl.!—Nomen vernacul. "Cabeza de Negro." Common all over the Isthmus; Chagres (Fendl. nos. 335 et 336); Portobelo (Billberg).

This species, at once recognized by its large rhizome, which resembles that of *Testudinaria elephantipes*, Burch., has, like most of the species of *Dioscorea*, a very extensive range. It is found in Mexico (Hartweg, Schiede, Galeotti), Central America (Barclay), New Granada (Billberg, Fendler, Seemann), Surinam (Hostmann), Brazil (Spruce).

977. Dioscorea *alata*, Linn., Kth. Sp. Plant. vol. v. p. 387.—Nomen vernacul. "Ñame." Cultivated extensively on account of its esculent tubers.

978. Dioscorea *sapindoides*, Presl, Kunth, Sp. Pl. vol. v. p. 410. Common amongst the shrubs of the savanas about Panama.

SMILACINEÆ.

979. Smilax *Schomburgkiana*, Kth., Spec. Plant. vol. v. p. 187.—Nomen vernacul. "Zarzaparilla." In woods, common all over the lower regions of the Isthmus.

980. Smilax *tomentosa*, H. B. et K., Kth. Spec. Plant. vol. v. p. 231. Volcano of Chiriqui, Veraguas.

981. Smilax *officinalis*, H. B. et K., Nov. Gen. vol. i. p. 271.—*S. papyracea*, Duham. Arb. ed. Mich. vol. i. p. 242!—*S. medica*, Schlecht. et Cham. in Linnæa, vol. vi. p. 47!—Nomen vernacul. "Zarzaparilla." Volcano of Chiriqui, Veraguas (Warszewicz).

A perusal of the various treatises on Sarsaparilla tends to confirm the soundness of Sir William Hooker's remark, that those plants most useful to mankind are generally the least known botanically. Even Pereira, with all his industry and research, could give in his 'Elements of Materia Medica and Therapeutics' (London, 1850) but an unsatisfactory account of the botanical sources of the various sorts of Sarsaparilla; and I well remember, that in the last conversation which I had with that great pharmacologist, he expressed an ardent wish that some competent person might be induced to investigate this perplexing subject. I am not vain enough to look upon myself as the "competent person" to whom Pereira wished to assign the investigation; and if the settlement of the question depended upon the opinion of great authorities, I would not have ventured to meddle with it; but, as it has solely to be decided by the simple elucidation of facts, I have made an honest attempt to cut the knot, the untying of which has been so often tried in vain.

M. de Warszewicz, during his last visit to the Volcano of Chiriqui, in Veraguas, collected specimens of a Sarsaparilla, which he transmitted to Mr. Daniel Hanbury. These were submitted to me for determination. After a careful examination, I pronounced them to belong to *Smilax officinalis* of Humboldt, Bonpland, and Kunth; but, as *Smilax officinalis*, H. B. et K., had been described from imperfect materials, Mr. D. Hanbury made, during a sojourn in Paris, a tracing of the original specimens from which the three botanists drew up their description. This tracing agreed in every essential point with the specimens from the Volcano of Chiriqui, and left in my mind no doubt that I had named them correctly. A fortunate coincidence confirmed this view. When M. de Warszewicz lately visited Bajorque, in New Granada, the place where Humboldt and Bonpland obtained the *Smilax officinalis*, he took the precaution to collect specimens of the Sarsaparilla of that locality (where, by the bye, it has now become very scarce), which,

in November, 1853, he placed in the hands of Mr. D. Hanbury, through whose kindness I was able to identify them, not only with *Smilax officinalis* of H. B. et K., but also with the specimens previously collected on the Volcano of Chiriqui. Having now a thorough knowledge of the *Smilax* named *S. officinalis* by Humboldt and his fellow-labourers, I began to examine the different species considered allied to it. The first one attracting my notice was *Smilax papyracea* of Duhamel. On this species, Mr. Robert Bentley had, in April, 1853, published an able article in the 'Pharmaceutical Journal;' and applying to that author for additional information, he, like a true man of science, most cheerfully granted my request, and willingly allowed me to examine the specimens which served as materials for his article. A critical examination of them convinced me, what I had already anticipated from comparing Dentley's description with the specimens of *S. officinalis* in my possession, and Duhamel's diagnosis of *S. papyracea*, that *Smilax papyracea* and *S. officinalis* were identical. The second species arresting my attention was *Smilax medica* of Schlechtendal and Chamisso. This species has been well described, and a tolerably good figure of it has been published, by Nees von Esenbeck; a close comparison of which with *Smilax papyracea* and *S. officinalis* proved it to be identical with them; so that the three names, *S. officinalis*, H. B. et K., *S. papyracea*, Duham., and *S. medica*, Cham. et Schlecht., are synonyms of one species,—a fact easily accounted for, when it is considered that the roots, stem, branches, and foliage, from which the chief characters of these three supposed species had been derived, are more variable than those who make species in their closets are apt to think.

Having now shown what number of synonyms belong to the true *S. officinalis*, I proceed to give an account of the plant itself, in order to prevent botanists from making similar mistakes to those they have already committed. *Smilax officinalis* grows on the slopes of mountains, to an elevation of 5000 feet above the sea, and is confined, as far as we at present know, to the continent of South America, where it ranges between the 20th degree of north and the 6th degree of south latitude, and the 110th and the 40th degrees of west longitude. Jamaica, whence so great a portion of Sarsaparilla used is annually obtained, does not produce any itself, as has been well ascertained; the article known by the name of "Jamaica Sarsaparilla" is merely imported into that island from the Spanish Main, and afterwards shipped for Europe and the United States of America. Nor are there any authentic data for believing that *S. officinalis* occurs in any other island of the West Indies, although such a distribution would be by no means an unlikely one.

The rhizome (chump) of the plant is cylindrical, and the roots (the Sarsaparilla of commerce), abounding, according to age and the place they grow in, more or less in starch, are as much as ten feet long, and generally furnished with branched rootlets (beards). The plant itself is in every part glabrous, and averages fifty feet in length. The stem is quadrangular, furrowed or striated, and on the edges clad with flat prickles, which are occasionally curved upwards. The branches are, like the stem, quadrangular, or often multangular, and either with or without prickles. The petiole, sheathing at the base, is furnished with two spirally twisted tendrils, which are often 10 inches long, and either with prickles or destitute of them. The leaves are extremely variable; at times they are broadly cordate, almost trilobed, gradually tapering into an acumen; at others they are ovate-oblong, and even lanceolate and rounded at the apex, but almost mucronate; they are generally five-nerved, the two outermost nerves being mostly bifurcated; all the nerves are prominent on the under surface of the leaves, acutely edged and often furnished with prickles; the colour of the leaves is dark green, the under surface being a shade paler than the upper, but never glaucous, like many other species of *Smilax;* the length of the leaves varies from 2 inches to 1 foot, and the breadth (at the base) from 1 to 6 inches; in thickness they vary considerably, being either coriaceous or more or less paper-like, and they have, moreover, in the latter case, transparent lineolar dots. The peduncles are axillary and solitary, somewhat flattened, and they bear an umbel composed of about sixteen flowers. The flowers are still unknown. The berries are round and red, and of the size of a small cherry, or even smaller than that. Each berry contains from two to three plano-convex seeds, of a light brown colour.

Botanists, competent to judge of the true limits of species, are not likely to raise any objection to my

uniting *Smilax officinalis* with *S. papyracea* and *S. medica;* but pharmacologists, unless supplied with the strongest proofs, will probably be disinclined to adopt the views I have advanced. They regard the different commercial sorts as essentially distinct from each other, and lay great stress upon certain characters, which, however striking to a superficial observer, are of little or no importance, botanically speaking. For instance, the so-called Lisbon or Brazilian Sarsaparilla,—that which comes to us in rolls about three feet long, —is chiefly distinguished by having fewer rootlets, or beards, than that termed "Jamaica Sarsaparilla;" and as the beards contain a great amount of mealy matter, it is on that account of less value in the market. But, if the roots of the Lisbon Sarsaparilla are examined, it is plainly seen that the rootlets have been removed by some rough mechanical process, and that all the places where the rootlets have been are clearly discernible, proving that the roots when gathered had as much beard as the sort usually received as Jamaica Sarsaparilla, and making it probable that if the merchant buying up this Zarza in various parts of Brazil, were to inform the collectors that by preserving the beard they would not only save themselves much unnecessary trouble, but increase the weight and the commercial value of the roots they dig up, we should soon get all our "Jamaica" Sarsaparilla from Brazil, and in a few years have difficulty in obtaining even a specimen of what is now termed "Lisbon Sarsaparilla."

But the chief distinction which pharmacologists make between the various commercial sorts of Sarsaparilla is that of "mealy" and "non-mealy." Mealy ('sarsaparillæ farinosæ seu amylaceæ') are called those sorts in which there is, just below the outer cortical layer, a mealy coat, of greater or less thickness; and non-mealy ('sarsaparillæ non-farinosæ seu non-amylaceæ'), those which are either wholly destitute of any meal, or have a very thin mealy coat. This distinction, it must be confessed, is not one which would or could be admitted by a logical thinker; but the very fact that it is adopted by a great body of pharmacologists is sufficient to invite criticism. It might be advanced, as an *à priori* argument, that roots, or rhizomes, or any other organs of two individual plants, though they may be mealy in the one and non-mealy in the other, need *therefore* not necessarily belong to two distinct species. The waxy potato of Kamtchatka is not different in species from the mealy one of Germany; again, *Pteris aquilina* of England, though its caudex is destitute of starch, is specifically identical with *Pteris esculenta* of New Zealand, the caudex of which is charged with starchy matter to such a degree that it affords a nutriment to the natives of that country. But I will dispense with that argument, and merely confine myself to stating, that the presence or absence of meal in Sarsaparillas depends, it would seem, upon age, and the locality in which the roots are collected,—that the formation of starch is probably entirely regulated by physical circumstances. Anybody opening a bundle of Jamaica Sarsaparilla, may pick out as many roots as he chooses being mealy at one end and non-mealy at the other. We have here the clearest evidence that one and the same root assumes different characters of internal structure, and, as a matter of course, external appearance. This fact ought to convince any unprejudiced mind that the distinction alluded to is not tenable; but, to furnish still another proof, I will allude to Bentley's specimens of Guatemala Sarsaparilla*. The roots of those specimens are generally as mealy as any that are known; yet not only do we find them at times destitute of starch, but they are, without doubt, botanically identical with *Smilax officinalis*, H. B. et K.

I am aware that the form of the cells of the nucleus-sheath of the roots and other less absolute characters have been considered by physiologists as furnishing good marks of distinction between the Sarsaparillas of Central America and those of South America. But how little value can be attached to that distinction will best be seen by a perusal of the following extract from Bentley's paper above alluded to:—

"When examined by the microscope the cells of the inner cortical layers of the Guatemala Sarsaparilla are found to contain bundles of acicular raphides, and a large number of the starch granules. The pith also is found commonly to contain a number of similar starch granules. The breadth of the pith is

* This sort is also sold by Mr. Keating, St. Paul's Churchyard, London, under the name of "red Paraguan Sarsaparilla," and was exhibited in the Great Exhibition of 1851, sub Class II., no. 102.

usually from one to one and a half, or perhaps a little more, that of the woody zone. In this respect it resembles the Honduras Sarsaparilla, and, according to Schleiden, also all those sorts of Sarsaparilla which are obtained from Central America. The cells of the liber, or, as it is called by Schleiden, the *nucleus-sheath*, are elongated radially or from within outwards, and have walls which are thicker on the inner than the outer side. In this respect it resembles the South American and Mexican Sarsaparillas, which Schleiden says always present this peculiarity. This microscopical appearance is remarkable, because, according to Schleiden, the Honduras and all the Central American sorts of Sarsaparilla are characterized by having the cells of the nucleus-sheath either square or somewhat elongated transversely, and all their walls of nearly equal thickness; and he believes that he can distinguish Central American from South American and Mexican Sarsaparillas by the appearances thus presented, combined with the different relative proportions of the woody layer and the pith already alluded to. But if this be true generally (which, so far as my experience goes, is not absolutely the case, having observed some sorts of Brazilian Sarsaparilla in which the cells of the nucleus-sheath were elongated somewhat in a direction from within outwards, and so far therefore agreeing generally with the anatomy of South American Sarsaparillas according to Schleiden, but yet had their outer and inner walls of nearly equal thickness, and thus agreeing with the Honduras variety), it is certainly not true in the present sort; for here we have a Central American Sarsaparilla which agrees with Schleiden's arrangement generally as regards the relative proportions of pith and woody layer, but differs from it in the cells of the nucleus-sheath being elongated from within outwards or radially, and having walls which are thicker on the inner than the outer side."

I may therefore safely conclude that the greater portion of Sarsaparilla is the produce of *one* species of *Smilax;* and that species is *S. officinalis*, H. B. et K. (*S. papyracea*, Duham., *S. medica*, Cham. et Schlecht.). But I do not wish it to be believed that, by showing the identity of these three supposed species, I intend to abolish the commercial distinctions now so universally acknowledged in the Sarsaparilla trade. As long as the Brazilians continue to strip the roots of the beard, and put them up in the same long rolls they now do, there will always be Lisbon Sarsaparilla in the market; as long as the inhabitants of the Spanish Main continue to preserve the rootlets, we shall have Jamaica Sarsaparilla; and as long as the climate and other physical circumstances of Guatemala remain unchanged, we shall always receive from that locality Sarsaparilla distinguished by its abundance of starchy matter.

PONTEDERACEÆ.

982. Heteranthera *reniformis*, Ruiz et Pav., Kunth Enum. vol. iv. p. 123. In swamps, about Chagres (Fendler, no. 294) and Panama.

BUTOMACEÆ.

983. Limnocharis *Plumierii*, L. C. Richard, Kunth Enum. vol. iii. p. 167. In rivulets near the city of Panama.

ALISMACEÆ.

984. Sagittaria *Guyanensis*, Humb. Bonpl. et Kunth, Kunth Enum. vol. iii. p. 161. Swamps, near Panama.

COMMELYNEÆ.

985. Commelyna *agraria*, Kunth, Enum. vol. iv. p. 38. Panama, on roadsides, and in fields.

986. Commelyna *elegans*, H. B. et K., Kunth Enum. vol. iv. p. 55. Panama.

987. Tradescantia *undulata*, Willd., Kunth Enum. vol. iv. p. 98. Volcano of Chiriqui, Veraguas.

988. Tradescantia *filiformis*, Martens et Gall., Kunth Enum. vol. iv. p. 696.—*Aneilema floribundum*, Hook. et Arn. Bot. Beech. p. 311, excl. syn.! Banks of the River Pequeni, Province of Panama.

989. Tradescantia *triandra*, Kunth, Enum. vol. iv. p. 93. Panama (Hinds).

990. Tradescantia *Cumanensis*, Kunth, Enum. vol. iv. p. 96. Panama (Hinds).

ERIOCAULEÆ.

991. Eriocaulon *Benthami*, Kunth, Enum. vol. iii. p. 545.—*E. microcephalum*, Hook. et Arn. Bot. Beech. p. 311, non H. B. et K.! Swampy places, near the City of Panama.

CYPERACEÆ*.

(*Auctore Nees ab Esenbeck.*)

Cyperaceæ.

992. Pycreus *Elliottianus*, N. ab E. in Linn. ix. p. 283.—*Cyperus Elliottianus*, Schult. Mant. ii. p. 100.—*Cyperus fasciculatus*, Ell., Bot. of South Carol. and Georg. Panama. (Seemann, p. 183.)
Var. *humilis;* spiculis capitatis divaricatis 2–4 longissimis 40–60-floris, foliis linearibus culmum digitalem fere æquantibus.

993. Cyperus *Luzulæ*, Rottb. Gram. p. 23. t. 13. f. 2.—N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 20.—H. B. et Kth. Nov. Gen. i. p. 209.—Kunth, Synops. i. p. 141. En. ii. p. 43. Panama. (Seemann, n. 148.)

994. Cyperus *Haspan*, Linn. Var. *a, contractus*, N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 23. Panama. (Seemann, n. 143.)

995. Kyllingia *aphylla*, Kunth, En. ii. p. 127.—*Kyllingia vaginata*, Lam.—*Kyllingia capitata*, Beauv. Fl. Ow. et de Ben. i. t. 31. Panama. (Seemann, n. 1043.)

996. Lipocarpha *gracilis*, N. ab E. in Endl. et Mart. Fl. Bras. fasc. iii.–v. p. 64. et in Linn. ix. p. 267.—Kunth, En. ii. p. 268.—*Hypolibium gracile*, Richard, in Pers. Syn. i. p. 70. Panama. (Seemann, n. 146.)

Ficinieæ.

997. Fimbristylis *brizoides*, N. et May. Var. *pallens*, β 2 *divaricata*, N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 75. Panama. (Seemann, n. 149.)

* The determination of the plants of this and the following Order is the last systematic labour of Dr. Nees von Esenbeck; it was accompanied by a series of observations on the different species, written in German, and published, as the space of this work did not admit of their being inserted at this place, in the 'Bonplandia.'—*B. S.*

998. Fimbristylis *spadicea,* Vahl, En. ii. p. 291.—N. ab E. in Endl. et Mart. Fl. Bras. iii. v. p. 73.—Kunth, En. ii. p. 237. Darien. (Seemann, n. 1046.)

999. Trichelostylis *miliacea,* N. ab E. in Wight Contrib. p. 103.—Vahl, En. ii. p. 287.—Kunth, Enum. ii. p. 230.

Var. *β. microstachya;* spiculis solito minoribus pallidis, caryopsi subglobosa. Panama. (Seemann, n. 139.)

Scirpeæ.

1000. Chætocyperus *rugulosus,* N. ab E.; spicula oblonga di-trifaria, squamis ovato-oblongis acutiusculis infima paulo minore obtusa, bulbo styli conico in fructu basi trilobo, caryopsi obovata transversim rugulosa, culmo capillari, perigynio deciduo. Panama. (Seemann, n. 137.)

1001. Scirpidium *sulcatum,* N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 98.—*Eleocharis sulcata,* Kth. Enum. ii. p. 157.—*Eleocharis filiculmis,* Kth. Enum. ii. p. 144. Var. *β, liturata.* Panama. (Seemann, n. 141.) Its specific character is better expressed as follows:—Caryopsi obovata subtrigona obsoletissime striolata, styli basi dilatata apice conica compressa, spicula ovali oblongave, squamis tri-plurispiris ovatis, infima rigidula pallida trinervi, reliquis uninervibus margine membranaceis apice emarginato-bilobis, disco utrinque purpureo-liturato, culmis compressis sulcato-angulatis vagina mucronata, radice repente filiformi.

1002. Limnochloa *mutata,* N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 101.—*Scirpus mutatus,* Linn. Panama. (Seemann, n. 135.)

1003. Eleogenus *capitatus, β minor,* N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 101. Panama. (Seemann, n. 1044.)

1004. Eleogenus *nodulosus,* N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 104.—*Eleocharis consanguinea,* Kth. Enum. ii. p. 143.—*Scirpus elegans,* H. B. et Kth. Nov. Gen. i. p. 226. Panama. (Seemann, n. 135.)

Rhynchosporeæ.

1005. Dichromena *pura,* N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 112 not. Nomen vernacul. "Clavo." Panama, in savanas. (Seemann, n. 147.)

1006. Spermodon *eximius,* N. ab E. Sp. fasciculis axillaribus simplicibus terminalique composito simplicive patulis, spiculis ovatis subulato-acuminatis ferrugineis, caryopsi rugosa truncata lateribus submuticis, styli basi applanata mucronata basi biloba verticem fructus tegente, foliis anguste linearibus planis. Panama. (Seemann.)

1007. Haplostylis *armeriæflora,* N. ab E. in Endl. et Mart. Flor. Bras. iii.–v. p. 126.—*Rhynchospora armerioides,* Presl, Rel. Hænk. i. p. 197. t. 31. f. 2.—Kunth, Enum. ii. p. 289. Panama. (Seemann, n. 145.)

1008. Haplostylis *barbata, β Humboldtii,* N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 128.—*Haplostylis Humboldtii,* N. ab E. in Linn. ix. p. 295.—*Chætospora pterosperma,* H. B. et K., Nov. Gen. et Sp. i. p. 230. Panama, and Santiago de Veraguas. (Seemann, n. 142.)

1009. Rhynchospora *cephalotes*, Vahl, En. ii. p. 237.—N. ab E. in Linn. ix. p. 297.—Kunth, Enum. ii. p. 301. Island of Coyba, Coast of Veraguas. (Seemann, n. 631.)

1010. Hypoporum *verticillatum*, N. ab E. in Linn. ix. p. 303.—*Scleria verticillata*, Mühlenb. in Willd. Spec. Pl. iv. p. 317.—Kunth, En. ii. p. 353. Panama. (Seemann, no. 144.)

1011. Scleria *pratensis*, N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 179. t. 23.—*Scleria margaritifera*, Gærtner de Fr. et Sem. pl. i. p. 13. t. 1. f. 7 (excl. synn. Willd.).—*Scleria communis*, Kunth, Enum. ii. p. 340. Panama, in savanas. (Seemann, n. 125.)

1012. Marolomia *bracteata*, Schrad. N. ab E. in Endl. et Mart. Fl. Bras. iii.–v. p. 182. t. 24. Var. *a*, laxive floribus fructibusque minoribus. — *Scleria bracteata*, Cuv. ic. 34. t. 57. Panama. (Seemann, n. 430.)

GRAMINEÆ.

(*Auctore Nees ab Esenbeck.*)

I. Paniceæ.

1013. Paspalus *compressus*, N. ab E., Agrostogr. Bras. p. 23.—*Paspalum platycaule*, H. B. et Kth., Nov. Gen. et Sp. Pl. i. p. 90.—Tr. ic. x. t. 115.—Kth. En. i. p. 48. Panama, in rivulets. (Seemann, n. 120.) Alter in the diagnosis "foliis obtusis" into "foliis breviacutis obtusisve;" and "glabris," into "inferioribus basi vaginisque ora ciliatis."

1014. Paspalus *plicatulus*, N. ab E. Agrostogr. Bras. p. 67. — *Paspalum undulatum*, H. B. et Kth. Nov. Gen. et Sp. Pl. i. p. 93.—Kth. Syn. i. p. 170. En. i. p. 62.

Var. β 1; totus glaber, spiculis minoribus subsolitariis glabris. Panama, in rivulets. (Seemann, n. 121.)

1015. Paspalus *paniculatus*, Flügge, Monogr. p. 180.—N. ab E. Agrostogr. Bras. p. 72.—*Paspalum paniculatum*, Linn. Sp. Pl. i. p. 81.—Kth. En. i. p. 59.—Tr. Ic. xi. t. 127.

Var. β. *piliger;* rhachi setoso-ciliata.—N. ab E. l.c. p. 73. Panama. (Seemann, n. 1559.)

1016. Paspalus *stellatus*, Flügge, Monogr. p. 65.—N. ab E. Agrostogr. Bras. p. 78.—*Paspalum stellatum*, H. B. et Kth. Syn. i. p. 164. En. i. p. 41. Tr. Ic. x. t. 119.

Var. *a. monostachyus*, N. ab E. l.c. Near Anton. (Seemann, n. 129.)

1017. Panicum *latifolium*, Linn., Trin. Panicear. Gen. in Act. Petrop. ser. vi. tom. iii. p. 174.—*Panicum divaricatum*, Lam. Ill. i. p. 174.—Humb. Bonpl. et Kth. N. Gen. et Sp. Pl. i. p. 101.—N. ab E. Agrostogr. Bras. p. 202.—Kth. En. i. p. 120.

Var. *a*; foliis glabris, panicula densa ramis erectis (caule subsimplici). Panama. (Seemann, n. 130.)

1018. Panicum *tenuiculmum*, Meyer, Essequeb. p. 58.—N. ab E. Agrostogr. Bras. p. 95.—Tr. Ic. xviii. t. 215.—*P. agrostidiforme*, Raddi, Agrost. Bras. p. 48. Panama, in swamps. (Seemann, n. 124.)

1019. Panicum *trichodes*, Sw., Prodr. Fl. Ind. Occ. p. 24. Fl. Ind. Occ. i. p. 176.—N. ab E. Agrostogr. Bras. p. 205. Var. *a*. Panama. (Seemann, 1042.)

1020. Panicum *trichanthum*, N. ab E., Agrostogr. Bras. p. 210. Panama. (Seemann, n. 131.)

1021. Isachne *trachysperma*, N. ab E.—*Panicum* (Isachne) *trachyspermum*, Gen. in Act. Acad. Petrop. ser. vi. tom. iii. p. 242.—*Panicum trachyspermum*, N. ab E., Agrostogr. Bras. p. 212.—Kth. En. i. p. 112. Panama, in rivulets. (Seemann, n. 122.)

1022. Oplismenus *Humboldtianus*, N. ab E., Agrostogr. Bras. p. 264—*Oplismenus Burmanni*, H. B. et Kth. Nov. Gen. et Sp. Pl. i. p. 106.—Kth. Syn. i. p. 180. En. i. p. 139 (excl. synon.). —*Panicum lappaceum*, Herb. Willd. Panama, in savanas. (Seemann, n. 127.)

1023. Gymnothrix *complanata*, N. ab E.; spica solitaria, involucro inæquali increscente setis majoribus spiculam superantibus, gluma inferiori brevissima obtusa truncatave, superiori flosculis plus duplo breviori setaceo-mucronata trinervi, flosculis æqualibus conformibus utroque hermaphrodito bivalvi, valvulis subulato-acuminatis, inferiori flosculi inferioris chartacea apicem versus septemnervi, superioris flosculi apicem versus 3-nervi, foliis linearibus margine serrulatis supra laxe hirsutis. Panama. (Seemann, n. 1560.)

II. Olyreæ.

1024. Pharus *scaber*, H. B. et Kth. Nov. Gen. et Sp. Pl. i. p. 196.—N. ab E. Agrostogr. 301.—Tr. Panic. Gen. in Act. Acad. Petrop. ser. vi. tom. iii. p. 109.—*Pharus latifolius*, Lam. Ill. Gen. t. 769. f. 2. Panama. (Seemann, n. 1047.)

III. Saccharinæ.

1025. Schizachyrium *condensatum*, N. ab E., Agrostogr. Bras. p. 333.—*Andropogon condensatus*, H. B. et Kth. Nov. Gen. et Sp. Pl. i. p. 151.—Kth. Syn. i. p. 242.—Kth. En. i. p. 494.—Var. *a, densum*. Panama. (Seemann, n. 1563.)

1026. Trachypogon *Montufari*, N. ab E., Agrostogr. Bras. p. 342.—*Andropogon Montufari*, H. B. et Kth. Nov. Gen. et Sp. Pl. i. p. 184.—Kth. Syn. i. p. 240.—Kth. En. i. p. 486. Panama, in savanas. (Seemann, n. 133.)

1027. Anthistiria *Humboldtii*, N. ab E., Agrostogr. Bras. p. 369.—*Anthistiria reflexa* et *foliosa*, H. B. et Kth. Nov. Gen. et Sp. Pl. i. p. 191. et Kth. Syn. i. p. 482. n. 11 et 12.—*Cymbopogon Humboldtii*, Spr. Pug. ii. p. 15. S. Veg. i. p. 289.—*Andropogon bracteatus*, Willd. Sp. Pl. iv. 2. p. 914. —*Andr. trachypus*, Tr. in Act. Acad. Petrop. ser. vi. tom. ii. 3. p. 280. Panama. (Seemann, n. 1562.)

Var. *β. foliosa* (*Anchistiria foliosa*, Humb. et Kth.).

IV. Tristeginæ.

1028. Arundinella *Deppeana*, N. ab E. in Herb. Lindl. Panama. (Seemann, n. 428.)

Ed. paniculæ ramis laxiusculis trigonis læviusculis confertim fasciculatis coarctatis, spiculis lanceolatis carinatis, arista spicula sua duplo (subtriplo) longiore, gluma superiore caudato-attenuata.

1029. Arundinella *pallida*, N. ab E. Agrostogr. Bras. i. p. 465.—Kth. En. i. p. 515.

Var. *a. laxa*, N. ab E. l.c. **angustifolia;* foliis angustis canaliculatis fere filiformibus vaginisque glabris, ore barbatis, arista paulo longiore. On the banks of rivulets, Cruces. (Seemann, n. 427.)

V. Agrostideæ.

1030. Sporabolus *rupestris*, Kth., Gram. i. p. 267. t. 45.—En. i. p. 212. ii. p. 167. Panama, in rivulets. (Seemann, n. 123.)

1031. Ægopogon *geminiflorus*, Humb. et Kth., Nov. Gen. et Sp. Pl. i. p. 133. t. 43.—Kth. En. i. p. 235. Panama. (Seemann, n. 1561.)

VI. Stipeæ.

1031 *bis*. Ortachne *pilosa*, N. ab E. in Herb. Lindl.—*Streptachne pilosa*, H. B. et Kth. Nov. Gen. et Sp. Pl. vol. i. p. 124.—Presl, in Rel. Hænk. vol. i. p. 225.—*Aristida Jorullensis*, Kth. Gram. vol. i. p. 62. En. i. p. 194. Santiago de Veraguas. (Seemann, n. 126.)

1032. Chætaria *capillaris*, N. ab E., Agrostogr. Bras. p. 388.—*Chætaria capillacea*, Pal. de Beauv.—*Aristida capillaris*, Cav. Ic. t. 468. f. 1.—*Aristida capillacea*, Tr., Kth. En. i. p. 188. Santiago de Veraguas. (Seemann, n. 134.)

VII. Chlorideæ.

1033. Dactyloctenium *mucronatum*, Pal. de Beauv., Agrostogr. p. 160.—N. ab E., Agrostogr. Bras. p. 437, cum synon.—*Dactyloctenium Ægyptiacum*, H. B. et Kth., Nov. Gen. et Sp. Pl. i. p. 170.—Kth. Syn. i. p. 229. En. i. p. 261.

Var. *contractum*; culmo repente, ramis simplicibus rectis erectis, foliis margine parum ciliatis potius ciliato-scabris, spicis brevibus 6–8 lin. longis erectis. Panama, in savanas. (Seemann, n. 132.)

1034. Eleusine *Indica*, Gærtn., H. B. et Kth. Nov. Gen. et Sp. Pl. i. p. 65.—Kth. En. i. p. 272.—N. ab E. Agrostogr. Bras. p. 439.

Var. β*. *distachya*; spiculis bifloris, spicis longis recurvo-divergentibus. Panama, on roadsides. (Seemann, n. 429.)

1035. Eutriana *repens*, Kth. Gram. i. p. 95.—H. B. et Kth., Nov. Gen. et Sp. Pl. i. p. 172. t. 52. En. i. p. 281. Rio de Santamaria. (Seemann, n. 128.)

VIII. Poeæ.

1036. Eragrostis *acutiflora*, N. ab E., Agrostogr. Bras. p. 501.—Tr. in Act. Acad. Petrop. ser. vi. vol. i. p. 411.—*Poa acutiflora*, H. B. et Kth., Nov. Gen. et Sp. Pl. i. p. 161.—Kth. Syn. p. 222. En. i. p. 328. Panama, in savanas. (Seemann, n. 119.)

1037. Eragrostis *ciliaris*, Linn., N. ab E. Agrostogr. Bras. p. 512.—Tr. in Act. Acad. Petrop. ser. vi. vol. i. p. 397.—*Poa ciliaris*, Linn., H. B. et Kth. Nov. Gen. et Sp. Pl. i. p. 162.—Kth. Syn. i. p. 323. En. i. p. 337.

(Var. *a*, spica subinde longa interrupta.)—Panama, on rocks and old walls. (Seemann, n. 118.)

1038. Uniola *paniculata*, Linn., Catesby Carol. i. t. 32.—Tr. in Act. Acad. Petrop. ser. vi. vol. i. p. 359.—Mühlenb. Descr. Gram. Torrey, Fl. Am.—Kth. En. i. p. 425. Panama. (Seemann, n. 1048.)

"Besides the *Gramineæ* enumerated, there are cultivated in the Isthmus:—Caña de azucar (*Saccharum officinarum*, Linn.), Maiz (*Zea Mays*, Linn.), Yerba de Guinea (*Panicum jumentorum*, Pers.), and Yerba de Limon (*Andropogon Schœnanthus*, Linn.); the former three to a considerable extent in the open fields, the latter one only in smaller quantities in gardens. I collected, besides, the leaves of several bamboo-like plants in the woods, which however could not be determined."—*B. S.*

FILICES.

(*Auctore J. Smith.*)

In this enumeration, I have followed the arrangement published by me in Hooker's 'Journal of Botany,' vol. iv. p. 46 *et seq.*, except in such cases where later observations and altered views have rendered changes necessary. In my enumeration of the Ferns cultivated in the Royal Botanic Gardens at Kew (Botanical Magazine, vol. lxii., 1846) I arranged the species of *Polypodium* under four sections, characterized by the different modes in which the fronds are developed and attached to the axis of growth (vernation). The first of these sections contains *Polypodium vulgare*, which, with its allies, presents a mode of growth quite different from that of those species constituting the other three sections; the three latter I now consider as presenting only different modifications of another and more general mode of growth; and although all the species of the four sections agree in the technical character of *Polypodium*, in having punctiform naked sori seated on free veins, yet the two different modes of growth found in the various species of *Polypodium* appear to me to be quite sufficient to warrant a separation of the species under distinct genera. I therefore restrict true *Polypodium* to those species having the same kind of vernation as *Polypodium vulgare*. The genus may then be viewed as representing a natural group of Ferns having the following characters:—The fronds are developed from the sides of a special rhizome, which has its axis of growth always in advance of the nascent frond (excurrent); the fronds are produced from nodes more or less distant from each other, each node producing a single frond, which, after having arrived at maturity, separates by a special articulation formed between the node and the base of the stipes; after the frond has fallen, the node remains in the form of a round, concave cicatrix, generally more or less elevated; the rhizome is solid, fleshy, and brittle, varying from long and slender to more or less short and thick, and is always covered with scales, which, unless they are common to the whole frond, seldom extend upwards beyond the node. This mode of development, which I have termed *Eremobrya*, is peculiar to a considerable number of *Polypodieæ*, including genera both with free and anastomosing veins; also a portion of *Davallia*, of which *D. Canariensis* may be viewed as the type, the whole forming a truly natural group of Ferns. The other mode of development to which I have alluded, and to which I have given the name of *Desmobrya*, is observable in a more numerous group of Ferns, bearing the following characters:—The fronds from a terminal axis, either in a single alternate series, or in a fascicle forming a corona; each succeeding frond is produced on the interior side of the bases of the preceding fronds, the bases being united and adherent; by the successive evolution of fronds a progressing accessory stem or cormus is formed, which varies in being decumbent or erect, short or more or less elongated, often assuming the aspect of trees, or, creeping on or under the surface of the ground, frequently forming cæspitose tufts; in those species producing their fronds in a single series, the developing axis sometimes elongates before the evident evolution of the fronds, which are then more or less distant from each other, and by this mode of growth forming a creeping or scandent caudex, which often assumes the character of a sarmentum, and then appears to agree with the mode of growth I have called *Eremobrya*, but it is readily distinguished by the epidermis and vascular structure of the stipes being continuous and united, forming part of the developing axis, and not being articulate as in *Eremobrya*. The various modifications of the structure observable in the group *Desmobrya* often mark the limits of what I term natural genera. *Desmobrya* therefore includes part of the *Ctenopteris* and the whole of the *Phegopteris* groups of *Polypodium*; also *Gymnogramma*, *Goniopteris*, *Meniscium*, and other genera of *Polypodieæ*; the whole of *Pteridieæ*, *Aspleniеæ*, and, with a few exceptions, *Acrostichieæ*, *Aspidieæ*, *Dicksonieæ*, and *Cyatheæ*.

I have here stated the obvious characters observed on examining examples of the two modes of development; the differences become more evident on examining their internal structure. I cannot enter into details in this place, the present collection not affording sufficient materials, nor the work space, to enable

me to state the changes in affinity that will become necessary in consequence of adopting this mode of arrangement. I will only further mention, that, although the two modes of growth are in general readily determined, yet in some cases, especially Herbarium specimens, it is a more difficult task. The genus *Woodsia* is peculiar, on account of the stipes of the original species having an articulation at a distance above the axis of vernation; nevertheless, as the vernation is terminal, and the bases of the stipes adherent, *Woodsia* must be referred to *Desmobrya*.

Tribe I. Polypodieæ.

(J. Sm. in Hook. Jour. Bot. vol. iv. p. 44.)

* *DESMOBRYA.*

Fronds in vernation terminal, their bases adherent, united with, and constituting the axis of growth.

1039. Xiphopteris *serrulata*, Kaulf. En. Fil. p. 85.—*Grammitis serrulata*, Sw. Willd. Sp. Fil. vol. v. p. 145. River Chagres, on trees.

Jamaica† (Wiles, Purdie), St. Vincent (Caley), British Guiana (Schomburgk), Brazil (Miers, Gardner).

1040. Ctenopteris *trichomanoides*, J. Sm. l. c.—*Polypodium trichomanoides*, Sw. Willd. l. c. p. 184. Woods near Panama.

Jamaica (Wilson, Purdie), St. Vincent (Caley), British Guiana (Schomburgk).

1041. Ctenopteris *delicatula*, J. Sm.—*Polypodium delicatulum*, Martens et Galeotti, Syn. Fil. Mex. p. 35. t. 7. f. 1. Southern Darien and Bay of Choco; growing intermixed with the following species.

Oaxaca, Mexico (Galeotti).

1042. Ctenopteris (Glyphotænium, *J. Sm.*) *crispata*, J. Sm. (Tab. XLVIII.); frondibus pendulis lineari-lanceolatis repando-sinuatis apice integerrimis basi attenuatis margine stipiteque rufo-pilosis, venis pinnatis, venulis furcatis, inferioribus anastomosantibus, superioribus liberis, soris inter venas uniseriatis 3–5 subimmersis ovali-rotundatis, medio et apice venularum insertis.—*Polypodium crispatum*, Linn., Plum. Fil. t. 102. f. 2? Southern Darien and Bay of Choco; growing on trees.

On account of some peculiarities in the habit and structure of this species, I have doubts as to the proper place it should occupy. Judging by habit, its nearest affinity appears to be with *Polypodium scolopendrioides*, Hook. et Grev., and *P. suspensum*, Sw., two species which, with a few others, constitute a small group related on the one hand to *Ctenopteris*, and on the other to *Polypodium pectinatum* and its allies; but *Ctenopteris crispata* differs from those, in having anastomosing as well as free veins, and from *P. vulgare* in its vernation being adherent. For the present I place it in *Ctenopteris;* but in a general arrangement of this group of *Polypodieæ*, I shall deem it necessary to characterize it as a separate genus, under the name of *Glyphotænium*. It appears to be a rare species, and it is with some doubts that I refer it to *Polypodium crispatum* of Linnæus, founded upon Plumier's figure above quoted.

Plate XLVIII. Fig. 1, 2, and 3, portions of the leaves, *magnified*.

1043. Gymnogramma *rufa*, Desv., J. Sm. l. c. p. 51.—*Hemionitis rufa*, Sw., Willd. l. c. p. 129. Woods near Cruces.

1044. Gymnogramma *ferruginea*, Kunze in Linnæa, vol. ix. p. 35. Woods near Cruces.

† The localities quoted are derived from specimens in my own Herbarium.—*J. Smith.*

1045. Gymnogramma *calomelanos,* Kaulf. l. c. p. 76.—*Acrostichum calomelanos,* L., Willd. l. c. p. 123. Common in the whole province of Panama.

Jamaica (Wilson), Puna and Cocos Islands (Barclay), west coast of Tropical America generally,—v. v. Hort. Kew.

1046. Leptogramma *totta,* J. Sm. l. c.—*Gymnogramma totta,* Schlecht. *G. Lowei,* Hook. et Grev. *G. pilosa,* Mart. et Gal. Syn. Fil. Mex. p. 27. t. 4. f. 1. Hacienda de Boquete, Veraguas.

Mexico (Galeotti), Brazil (Miers).

1047. Phegopteris (Fée's Gen. Fil. p. 242*.—*Polypodium* § *Phegopteris,* Presl, l. c. J. Sm. l. c.) *Seemannii,* J. Sm. (Tab. XLIX.); frondibus pinnatis, pinnis oppositis lato-lanceolatis attenuato-caudatis laciniatis breve petiolatis, superioribus subsessilibus, petiolis tuberculato-stipulatis, laciniis curvatis obtusis integris facile disjunctis, venulis 15–18, inferioribus 4–5, ad angulum acutum conniventibus, inter lacinias connexas costam attingentibus, soris medio venularum insidentibus, inter venas biserialibus.—Frondes *longe stipitatæ,* 2–8 *pedes altæ,* pinnæ 6–8 *uncias longæ,* 2 *uncias latæ.*—Cape Corrientes and Island of Chirambira, Darien.

In affinity this species comes nearest to Plumier's figure, tab. 21, which Swartz has quoted with a mark of doubt for his *Polypodium tetragonum,* and to which he also refers Schkuhr's tab. 18 b.; but the examination of specimens in Sir W. J. Hooker's and my own herbarium, has satisfied me that the figures of Plumier and Schkuhr represent two distinct species; Schkuhr's being the true *Polypodium tetragonum* of Swartz, which has the lower pair of venules anastomosing, and consequently is a *Goniopteris,* whereas the venules in *Phegopteris,* to which Plumier's and our present species belong, are all free. But in regard to the technical distinction of free and anastomosing veins, these two species are peculiar; for although the veins are not truly anastomosing, yet their apices connive in a manner which in a measure sets aside the character of free and anastomosing veins as a generic distinction. What tends to give the appearance of anastomosing veins to *P. Seemannii* and *P. Plumierii* is owing to the upper portion of the lower pair of venules converging towards the sinus between the laciniæ, and in the apparent margins of the laciniæ being continued down to the rachis, but united like a seam (suture) below the sinus, which union ultimately gives way; the laciniæ then appear as if they had been separated from each other by a sharp instrument. This peculiar structure is also found in a few other allied species.

Plate XLIX. Fig. 1, portion of the leaves, *magnified.*

1048. Goniopteris *tetragona,* Presl, Pterid. p. 183.—*Polypodium tetragonum,* Sw., Willd. l. c. p. 203. Wood near Panama.

St. Vincent (Caley), Cuba (Linden), Jamaica (Wilson).—v. v. Hort. Kew.

1049. Meniscium *angustifolium,* Willd. l. c. p. 133. On rocks, on the banks of rivulets near Cruces and San Juan.

1050. Meniscium *reticulatum,* Sw., Willd. l. c. p. 134. Island of Chirambira, Southern Darien.

Brazil (Raddi), St. Vincent (Caley).

1051. Taeniopsis *lineata,* J. Sm. l. c. p. 67.—*Vittaria lineata,* Sw. Willd. l. c. p. 404.—Presl, l. c. p. 145. Common in the woods of the Hacienda de Juan Lanas; growing on trees.

St. Vincent (Caley), Jamaica (Wiles, Purdie).

* After this paper was ready for the press, I received Fée's 'Genera Filicum,' published in 1852, of which I have availed myself by making a few changes in nomenclature, in order to avoid synonyms.

1052. Pteropsis *angustifolia*, Desv., Presl, l. c. p. 225.—J. Sm. l. c. p. 67.—*Tænitis angustifolia* Spreng. Syst. vol. iv. p. 42. Near the city of Panama; growing on trees.

St. Vincent (Caley), British Guiana (Schomburgk).

1053. Dryomenis (Fée's Gen. Fil.) *plantaginea*, J. Sm.—*Drynaria plantaginea*, J. Sm. Gen. Fil. l. c. p. 61.—*Polypodium plantagineum*, Jacq. Collect. ii. p. 104. t. 3. f. 1.—Willd. l. c. p. 161, (Plum. Fil. t. 128.)—Hook. Ex. Fil. t. 114.—*Phymatodes plantaginea*, Presl. Island of Chirambira, Southern Darien.

St. Vincent (Caley), Guadaloupe ex herb. Mus. Paris.

In my 'Genera Filicum' this species is placed under *Drynaria;* but, on reviewing that genus, I find that both *D. plantaginea* and *D. menisocarpon* differ from true *Drynaria* in having adherent vernation which renders it necessary to separate them from their former allies. In my herbarium they have long stood as a distinct group; and now that M. Fée has characterized *D. menisocarpon* as a genus under the name of *Dryomenis*, I adopt it, and add to it the present species, and also a magnificent undescribed species from New Granada (*D. Purdiei*). In natural affinity this genus ranks with *Dictyopteris*, and with *Aspidium* and *Hypoderris*, differing from the former in its more compound venation, and from the two latter by its naked sori; but, according to Fée, *Polypodium plantagineum* of Jacquin is an indusiate species, and therefore belongs to *Aspidieæ*. He is quite right so far, as regards specimens from Guiana and the Amazon, which he refers to that species; these specimens being furnished with a large peltate indusium, and in aspect slightly differing from the present, as also from the West Indian specimens of *P. plantagineum*, in which, after careful examination, I can find no trace of an indusium even in the early stage of the sori, and the structure of the sorus is such as to warrant me in believing it to be a gymnosorous species. This is another instance of species having the same habit and general appearance, but differing, in some having indusiate sori and others naked sori. Under such circumstances, I am induced to consider the presence and absence of an indusium to be of much less importance as a technical character than it has hitherto been viewed. In *Aspidieæ* there are many species which, after the indusium has fallen, can scarcely be recognized as specifically distinct from species of *Polypodieæ*, which normally have no indusium; and as that organ is very fugacious, soon coming to maturity and disappearing, the consequence is that many specimens of indusiate species, when collected fully matured, are referred to *Polypodieæ*, while younger fronds of the same species, before the loss of the indusium, are placed in *Aspidieæ*, of which there are many examples in Herbaria. Therefore, in a natural arrangement of species, these two tribes must necessarily be amalgamated.

** *EREMOBRYA.*

Fronds in vernation lateral, solitary, and ultimately separating from the axis by a special articulation.

1054. Lopholepis *piloselloides*, J. Sm. l. c. p. 56.—*Polypodium piloselloides*, Linn., Willd. l. c. p. 174. Panama, on trees.

Jamaica (Heward, Wilson, Purdie), St. Vincent (Caley).—v. v. Hort. Kew.

1055. Lepicystis *incana*, J. Sm. l. c. p. 56.—*Polypodium incanum*, Linn. Willd. l. c. p. 174.—Nomen vernacul. "Doradilla de palo." Common in woods, growing on trees.

Jamaica (Heward, Purdie), Brazil (Miers), United States (Herb. Hooker), Ecuador (Seemann).—v. v. Hort. Kew.

"The whole plant is used for preparing cooling draughts by the inhabitants."—*B. S.*

1056. Lepicystis *sepulta*, J. Sm. l. c. p. 56.—*Polypodium sepultum*, Kaulf. l. c. p. 104. Panama, on trees.

Brazil (Miers), British Guiana (Schomburgk), Ecuador (Hartweg), Mexico (Siebold).—v. v. Hort. Kew.

1057. Goniophlebium *pectinatum*, J. Sm.; frondibus lineari-lanceolatis profunde pinnatifidis utrinque attenuatis parce villosis, laciniis lineari-lanceolatis obtusis integerrimis attenuatis, soris uniserialibus. Panama, on trees.

Frondes 1–1½ pedes altæ, 2½ uncias latæ.

This species has much the appearance of *Polypodium pectinatum*, but is distinguished by the sori being seated within an areole formed by the anastomosing of the venules. Although I have described it as new, yet I must confess that it is very difficult to define its characters in words so as to distinguish it from its allies. The latter are numerous and very generally spread over the islands and continent of tropical America, the different localities producing aspects that to the eye look like distinct species, but to describe them as such, and so as to convey to the mind their distinctions, is in many cases impossible. This remark not only relates to the species under notice, but to many other Ferns; and such being the case, the question arises whether the different phases so closely resembling each other are forms which have been created as such, or are only modifications brought about in the lapse of time, consequent on the difference of soil and climate in which they are now found.

1058. Goniophlebium *patens*, J. Smith; frondibus stipitatis deltoideo-pinnatis, pinnis linearibus acutis leviter falcatis oppositis sessilibus adnatis subdecurrentibus margine obsolete crenatis, venis anastomosantibus uniareolatis, soris uniserialibus. Hacienda de Madre rodonda, on trees.

Frondes pedem altæ; pinnæ 4 uncias longæ, 4 uncias latæ, 4–5-jugæ.

In habit this comes near to *Polypodium trilobatum* of Cavanilles (*Synammia trilobata*, Presl); but the form of the areoles slightly differs, and in this species the sori are punctiform, not oblong as in *Synammia*, a character which, as a generic distinction, is hardly tenable.

1059. Goniophlebium *attenuatum*, Presl, l. c. p. 186. J. Sm. l. c.—*Polypodium attenuatum*, Humb., Willd. l. c. p. 191. Nomen vernacul. "Calahuala." Island of Taboga, on rocks.

Peru (Barclay), Esmeraldas, Ecuador (Seemann).

The examination of numerous specimens in Sir W. J. Hooker's herbarium, has induced me to refer the present specimens to the above species, which on comparing it with *Polypodium vacillans* and *harpeodes* of Link, I find it difficult to keep them separate as species. The two latter were first described by Link from plants cultivated in the Berlin Botanic Garden, which, when viewed growing under the same conditions, appear so distinct, that, on becoming familiar with their respective aspects in a living state, their fronds when in the herbarium can readily be referred to the names by which the plants are known; but the many gradations in the size and circumscription of the fronds of native specimens of this group render it difficult, if not impossible, to find characters to distinguish them in a general collection as distinct species. The number of anastomoses of the venules varies: in *G. harpeodes* and *G. vacillans* two anastomoses are formed between the midrib and margin, three in our present specimens, and four in a specimen from Peru: these differences do not appear to be brought about by the greater or lesser breadth of the pinnæ, but I am not prepared to say that the number is constant and characteristic of distinct species. In *G. attenuatum* and its allies the sori are uniserial: this distinguishes them from *G. neriifolium* and its forms, in which the sori are in two or more rows; but there are many modifications, some passing into the forms of *G. attenuatum*.

"The caudex of this species is used by the natives for making cooling draughts."—*B. S.*

1060. GONIOPHLEBIUM *neriifolium*, J. Sm. l. c. p. 57.—*Polypodium neriifolium*, Willd. l. c. p. 194. Southern Darien.

Tumaco (Seemann), Jamaica (Wiles), Trinidad (Aldridge), Brazil (Miers), and other parts of Tropical America, assuming various aspects.—v. v. Hort. Kew.

1061. GONIOPHLEBIUM *lætum*, J. Sm.—*Polypodium lætum*, Radd. Bras. Fil. t. 28, Link. En. Fil. p. 129. Southern Darien.

Brazil (Raddi).

Most authors place this as a synonym of *Polypodium latipes*, Lang. et Fisch., but it appears to me to be a distinct species.

1062. GONIOPHLEBIUM *distans*, J. Sm.—*Polypodium distans*, Radd. Bras. Fil. t. 31. Southern Darien.

Brazil (Miers), British Guiana (Schomburgk).—v. v. Hort. Kew.

1063. PLEOPELTIS *lycopodioides*, Presl, l. c. p. 193.—*Polypodium lycopodioides*, Linn., Willd. l. c. p. 148. River Chagres, on trees.

Jamaica (Heward, Wilson, Purdie).

1064. PLEOPELTIS *percussa*, Hook. et Grev. Ic. Fil. i. t. 47.—Presl, l. c. p. 193.—*Polypodium percussum*, Cav. Willd. l. c. p. 151. Southern Darien, on trees.

St. Catharine Island, Brazil (Barclay), British Guiana (Schomburgk), Tumaco (Seemann).—v. v. Hort. Kew.

The specimens collected at Tumaco, bearing the number 988, have the same aspect as my specimens of *P. stigmatica* of Presl, which I consider to be only a phase of *P. percussa*.

1065. CAMPYLONEURUM *repens*, Presl, l. c. p. 190.—*Polypodium repens*, Sw., Willd. l. c. p. 154. Southern Darien.

Jamaica (Wiles).—v. v. Hort. Kew.

1066. CAMPYLONEURUM *Phyllitidis*, Presl, l. c. p. 190.—*Polypodium Phyllitidis*, L., Willd. l. c. p. 157. Woods near Panama.

Jamaica (Heward, Wiles, Wilson).—v. v. Hort. Kew.

1067. CAMPYLONEURUM *immersum*, J. Smith, MSS.; frondibus simplicibus lanceolatis acuminato-caudatis basi attenuatis coriaceis marginatis supra impresso-punctatis, costis utrinque elevatis, venulis immersis obscuris, soris inter venas oblique biserialibus.—Frondes 1–1½ *ped. altæ*, 1½–2 *uncias latæ*. Bay of Utria, Darien.

Galapagos (Lieut. Wood).

The readiness with which new species are created by several pteridologists, makes me hesitate before venturing to add another to the list, for without the aid of authentic specimens or reference to good figures it is often difficult to determine from description alone what plant is really meant. In the present genus the general features of the so-called species are so very much alike, that the words used to describe one are in many cases quite applicable to others, the species varying merely in degree, as to length, breadth, texture, etc. The differences in the anastomosing of the veins would appear to indicate distinctions, but I have observed that uniformity is not the rule; fronds of the same individual plant, and even different parts of the same frond, are observed to vary in the more or less branching and anastomosing of the veins; so that I fear that even that character is of little value for specific distinctions.

This species is only known to me in the present collection. It is allied to *C. Phyllitidis* and *C. repens*, and approaches to a slender species from New Granada; but it differs from the whole of the genus in its venation being entirely immersed, not showing elevated lines as in the other species.

1068. Phymatodes (§ Pleuridium) *crassifolia*, Presl, Pterid. p. 196.—*Polypodium crassifolium*, L., Willd. l. c. p. 141.—*Pleuridium crassifolium*, Fée, Gen. Fil. p. 273. Southern Darien.

Jamaica (Heward, Wiles, Wilson), Tumaco (Seemann), Brazil (Miers), Peru (Barclay), Trinidad (Purdie).—v. v. Hort. Kew.

1069. Dicranoglossum (Cuspidaria, *Fée, non Dec.*) *furcata*, J. Sm.—*Cuspidaria furcata*, Fée, Gen. Fil. p. 88.—*Pteropsis furcata*, Willd., l. c. p. 136. Panama, on trees.

I agree with M. Fée in the propriety of separating this species from *Pteropsis angustifolia*; it differs both in habit and venation. In *Pteropsis angustifolia* the venation is uniform reticulated, forming transverse elongated areoles; whereas in *Dicranoglossum* the veins are simple, or forked and free, or their apices transversely combined by a marginal vein, which in the fertile fronds becomes the sporangiferous receptacle. Fée enumerates three species belonging to the genus, but they differ so little, that I am inclined to consider them as merely climatal modifications of one normal species; in some of these species the sterile veins are free, while in others they are combined; and in specimens from Quito, instead of the sorus being continuous, as characteristic of the genus, the sporangia are produced in definite ovate-oblong nearly confluent sori, a structure which may be viewed as the simple or normal state. The linear or continuous sorus generally seen in specimens from the West Indies, is the consequence of an elongation and lineal confluence of the sporangiferous points, being analogous to what is observed in the allied genus *Pleopeltis*.

Fée has characterized this genus under the name of *Cuspidaria*, but that name has already been applied by De Candolle to a genus of *Bignoniaceæ*, which, to prevent confusion, should certainly not be disturbed; I have therefore, and in accordance with the law of priority, in the present case substituted my manuscript name of *Dicranoglossum*.

Tribe II. Acrostichieæ.

(J. Sm. Hook. Jour. Bot. vol. iv. p. 147.)

1070. Elaphoglossum *viscosum*, Schott, J. Sm. l. c. p. 148.—*Acrostichum viscosum*, Sw., Willd. l. c. p. 103. Southern Darien.

Jamaica (Wiles), Trinidad (Aldridge).

1071. Elaphoglossum *scolopendrifolium*, J. Sm., MSS.—*Acrostichum scolopendrifolium*, Radd., Bras. Fil. t. 16. Southern Darien.

Brazil (Miers).—v. v. Hort. Kew.

1072. Elaphoglossum *horridulum*, J. Sm., MSS.—*Acrostichum spathulinum*, Radd., l. c. t. 15. f. 2.—*Acrostichum Raddianum*, Hook. et Grev., l. c. t. 14. Hacienda de Juan Lanas, province of Panama, on trees.

Brazil (Gardner).

1073. Rhipidopteris *peltata*, Schott, J. Sm. l. c. p. 150 (*sub* Polybotrya).—*Acrostichum peltatum*, Sw., Willd. l. c. p. 110. Cape Corrientes, Darien, on rocks.

Jamaica (Wiles), New Granada (Purdie).

1074. Polybotrya *Osmundacea,* H. et B.,Willd. l. c. p. 99.—*Polybotrya cylindrica,* Kaulf. l. c. p. 36. Chirambira, Southern Darien, and Coylea, Veraguas.

Jamaica (Heward, Wiles), Brazil (Miers).—v. v. Hort. Kew.

1075. Gymnopteris *aliena,* Presl, l. c. p. 244.—J. Sm. l. c. p. 156.—*Acrostichum alienum,* Sw., Willd. l. c. p. 119. Between Panama and Cruces, on rocks.

Jamaica and Santamarta (Purdie), Trinidad (Aldridge), Cuba (Linden).

1076. Acrostichum *aureum,* Linn., J. Sm. l. c. p. 152. Presl, l. c. p. 241.—*Chrysodium vulgare,* Fée. Nomen vernacul. "Guagara de puerco." Common in salt-swamps on the sea-coast.

Jamaica (Heward, Purdie, Wilson), Peru (Barclay), Mexico (Liebold), Luzon (Cuming), Pitcairn Island (Bennett), New Holland (A. Cunningham), New Caledonia (Moore), Ceylon (Gardner), Algoa Bay (Stanger), Sierra Leone (Don).—v. v. Hort. Kew.

Common throughout the tropics, and extending into the temperate regions of both hemispheres, presenting various aspects, which has led some authors to describe a number of species, thirteen being enumerated by Presl; but, judging from all the specimens that I have seen, I am induced to view the whole as consisting of one species only. Fée places this species in his genus *Chrysodium*, and changes the specific name to *vulgare*, which change is not admissible, as this species is the Linnæan type of the genus *Acrostichum*.

"The leaves of this species are commonly used for thatching in the coast districts of the Isthmus."—*B. Seemann.*

Tribe III. Pterideæ.

(J. Sm., Hook. Jour. Bot. iv. 156.)

1077. Notholæna *sulphurea,* J. Sm., MSS.—*Pteris sulphurea,* Cav., Willd. l. c. p. 361.—*Allosorus sulphurea,* Presl, l. c. p. 153. Panama.

1078. Cheilanthes *myriophylla,* Desv. (§ Physapteris), Presl. l. c. p. 161.—*C. paleacea,* Mart. et Gal. l. c. p. 76. t. 21. f. 2, Hook. Sp. Fil. vol. ii. p. 100. Panama.

Santamarta (Purdie, Linden), Peru (Jameson), Mexico (Liebold).—v. v. Hort. Kew.

1079. Cheilanthes *radiata* (§ Actinopteris,) J. Sm. Bot. Mag. vol. lxii.—*Adiantum radiatum,* Linn., Willd. l. c. p. 437, Presl, l. c. p. 158. Near the village of San Juan.

West Indies and Tropical America.—v. v. Hort. Kew.

1080. Adiantum *lucidum,* Sw., Hook. Sp. Fil. vol. ii. p. 4. Woods near Panama.

Tropical America and West Indies.—v. v. Hort. Kew.

1081. Adiantum *Seemannii,* Hook., l. c. p. 5. Woods about Panama.

1082. Adiantum *dolosum,* Kunze, Hook. l. c. p. 6. Woods near Panama.

1083. Adiantum *obliquum,* Willd., Hook. l. c. p. 8. Woods near Panama.

Jamaica (Purdie), St. Vincent (Caley), Martinique (Sieber).—v. v. Hort. Kew.

1084. Adiantum *lunulatum,* Burm., Hook. l. c. p. 11. Woods near Panama.

Tropics generally.

1085. Adiantum *dolabriforme*, Hook., Ic. Pl. t. 191, Sp. Fil. vol. ii. p. 12. Panama.

Brazil (Gardner).

1806. Adiantum *incisum*, Presl, Hook. Sp. Fil. vol. ii. p. 16. Woods near Panama.

Brazil (Miers), Island of Puna (Barclay).

1087. Adiantum *villosum*, Linn., Hook. l. c. p. 18. With the preceding species.

Island of Trinidad (Aldridge), Tropical America (Cuming).

1088. Adiantum *hirtum*, Kaulf., Hook. l. c. p. 20. Village of San Juan.

British Guiana (Schomburgk).

1089. Adiantum *prionophyllum*, H. et B., Hook. l. c. p. 21. Southern Darien.

Village of Esmeraldas, Ecuador (Seemann), and Islands of Tumaco (Barclay), Jamaica (Wiles), Martinique (Sieber), and Trinidad (Aldridge).

1090. Adiantum *triangulatum*, Kaulf., Hook. l. c. p. 26. Woods near Panama, and Island of Taboga.

Jamaica (Wilson), Trinidad (Aldridge), British Guiana (Schomburgk).

1091. Adiantum *trapeziforme*, Linn., Hook. l. c. p. 33. Woods between Panama and Cruces.

Jamaica (Heward, Wiles, Purdie).—v. v. Hort. Kew.

1092. Adiantum *concinnum*, H. et B., Hook. l. c. p. 42. Woods near Santiago de Veraguas.

Tepic (Barclay).—v. v. Hort. Kew.

1093. Adiantum *tenerum*, Sw., Hook. l. c. p. 45. Volcano of Chiriqui, Veraguas.

Jamaica and West Indies generally.—v. v. Hort. Kew.

"I have never observed any epiphytical species of *Adiantum*, though several species growing on rocks and old walls; the genus appears to be strictly terrestrial."—*B. S.*

1094. Litobrochia *elata*, J. Sm.—*Pteris elata*, Agardh, Mon. Pterid. p. 63. Woods near Panama.

Caraccas (Otto), Brazil (A. Cunningham, Miers).

1095. Litobrochia *propinqua*, J. Sm.—*Pteris propinqua*, Agardh, l. c. p. 65. Southern Darien.

Jamaica (Wiles), Esmeraldas, Ecuador (Seemann).

1096. Pteris *pungens*, Willd., l. c. p. 387, Agardh, l. c. p. 27. Panama.

Trinidad (Aldridge).—v. v. Hort. Kew.

1097. Pteris *caudata*, Linn., Agardh, l. c. p. 48.—Nomen. vernacul. "Negrajorra." Volcano of Chiriqui, Veraguas.

v. v. in Hort. Kew.

This species, with *P. aquilina*, and a number of similar forms, described by authors as distinct species, constitute a very natural and characteristic group of Ferns widely spread over the earth, occupying extensive tracts within the tropics, and extending to high latitudes of the temperate zones. The extreme forms of this group may readily be designated as distinct species, yet, on looking at the intermediate states from

the numerous localities, it becomes most difficult to define their limits as species, the kindred phases seeming as if they were geographical representatives, or the wide-spread lineage of a normal species, which the lapse of time and the influence of climate had changed, and brought into an apparent state of permanence.

1098. Blechnum *lanceola*, Sw., Spreng. Syst. vol. iv. p. 92.—Hook. Bot. Mag. t. 3240.—Kunze, Schk. Crypt. t. 57. f. 1.—*B. lanceolatum*, Radd., l. c. vol. i. t. 60. f. 3. Volcano of Chiriqui, Veraguas.

Brazil (Miers).—v. v. Hort. Kew.

The name *lanceola* is only applicable to this while the frond is simple; it often becomes trifoliate and pinnate.

1099. Blechnum *occidentale*, Linn., Willd. l. c. p. 412. Woods near Panama.

Jamaica (Wilson), Tumaco (Barclay), Brazil (Miers), Martinique (Sieber), Trinidad (Aldridge).—v. v. Hort. Kew.

1100. Lomaria *striata*, Willd., l. c. p. 291, Presl, l. c. p. 143. Southern Darien and Bay of Choco.

Peru (Barclay), Brazil (Miers, Gardner), Mexico (Liebold), Martinique (Sieber).

Forms of what I consider to be this species are found in many parts of Tropical America, and have in several cases been described as distinct species; thus we have *Lomaria Brasiliensis* of Raddi from Brazil, *Lomaria Chilensis* of Kaulfuss from Chile; but, on taking a general view of specimens from different localities, I cannot find sufficient characters whereby to distinguish them as specifically distinct.

In collecting native specimens of *Lomaria*, and similar genera which have the sterile and fertile fronds distinct from each other, it often happens that the fertile ones are not found at the time of the collector's visit, and in that case, the only evidence of the species being derived from imperfect materials, the sterile fronds are often referred to wrong genera. A remarkable instance of this has lately come to my knowledge. Barren fronds of a plant, a native of South Africa, had been received by Kunze, who, at page 506, vol. x. of the 'Linnæa,' referred them to *Lomaria coriacea* of Schrader, but afterwards, at p. 152, vol. xiii. of the same work, having observed that the specimens differed from Schrader's plant in several points, especially in the stipes being woolly, he called them *Lomaria eriopus*. Judging from what I consider satisfactory evidence, a living plant of this is now growing in the Apothecaries' Botanical Gardens at Chelsea, which was received from Port Natal: this plant has a pinnate frond 3½ feet in length (the stipes being two-thirds of the whole length); the pinnæ are smooth, 6–7 inches long by 1½ broad, lanceolate-acuminate, attenuated at the base, the lower ones petiolate and somewhat secund, margin cartilaginous, spinulose-serrate beyond the middle, veins evidently rising from a true midrib, forking close to the midrib, venules direct, parallel, curved upwards, terminating in the cartilaginous margin. On viewing this structure and the general aspect of the frond, it presents much resemblance to *Stenochlæna scandens*, or to some species of *Danæa*, but the nature of the caudex and mode of vernation remove the idea of its being a Fern. The caudex of the Chelsea plant is a solid, tuber-like, obconical body, 5 inches in height by 12 in circumference; the frond rises from a small knob on the apex, apparently formed of short, stipule-like, concrete scales, which, as well as the stipes, are pubescent, and therefore in that respect differing from *Lomaria*, which has squamose vernation; without seeing the venation of the frond, we would have no hesitation in referring this plant to *Cycadeæ*, and most resembling the small American Zamias. On making further inquiries respecting this plant, I was favoured by Professor Balfour of Edinburgh with the examination of a specimen, stated, in the handwriting of the collector Guenzius, to be the fertile state of "*Lomaria eriopus*," "first detected by him in 1849" at Port Natal, ten years after the sterile fronds had been described by Kunze. This fertile specimen proves to be the male cone of a Cycadeous plant; it is 5 inches in length, and about the thickness

of a finger, and is just such as might be expected (by analogy) to be produced from a caudex similar to that of the Chelsea plant. I have also been favoured with a note from Dr. G. Reichenbach, jun., of Leipzig, stating that he has compared the pinnæ of the Chelsea plant with Kunze's specimen of "*Lomaria eriopus*," and finds them to be identically the same; therefore *Lomaria eriopus* must be expunged from *Filices*, for although its venation is analogous to many Ferns, yet its character in every other respect shows that it belongs to *Cycadaceæ*, presenting a new feature in that order on account of its simply forked venation rising from a true midrib, thus rendering untenable the character which is usually relied upon for distinguishing fossil *Cycadeæ* from fossil *Filices;* but before we can with certainty determine the true relationship of this singular plant, it is necessary to be furnished with the female cone, which we hope to receive before long from Natal*.

Tribe IV. Asplenieæ.

(J. Sm., l. c. p. 170.)

1101. Hemidictyon *marginatum*, Presl, l. c. p. 111.—J. Sm. l. c. p. 178.—*Asplenium marginatum*, Linn., Willd. l. c. p. 309. Bay of Utria, Darien.

Jamaica (Wilson), Trinidad (Aldridge), St. Vincent (Caley).—v. v. Hort. Kew.

1102. Asplenium *serratum*, Linn., Willd. l. c. p. 304.—J. Sm. l. c. p. 173.—Presl, l. c. p. 106. —*Asplenium crenulatum*, Presl, l. c. p. 106. Woods of the Hacienda de Juan Lanas, province of Panama, on trees.

Jamaica (Wilson), British Guiana (Schomburgk), Venezuela (Aldridge), Brazil (Miers, Sellow).—v. v. Hort. Kew.

The name *serratum* is not quite applicable to all states of this species; in some the margin varies from more or less serrate to entire.

1103. Asplenium *integerrimum*, Spreng., Syst. vol. iv. p. 81.—Presl, l. c. p. 107. Panama.

Brazil (Miers), British Guiana (Schomburgk), Cuba (Linden).

1104. Asplenium *virens*, Presl, Reliq. Hænk. p. 41. t. 6. f. 3. et Pterid. p. 107. Panama.

Guayaquil (Barclay).

1105. Asplenium *fragrans*, Sw., Willd. l. c. p. 345.—*A. Mexicanum*, Mart. et Gal., l. c. p. 62. t. 15. f. 4. Volcano of Chiriqui, Veraguas.

Jamaica (Purdie), Mexico (Galeotti).—v. v. Hort. Kew.

Asplenium fæniculaceum, H. et B., is probably only a slight variation of this species. The gradual transition of forms in this extensive and wide-spread genus, renders it impossible to determine with any degree of certainty the limits of many of the species originally described by Linnæus, Swartz, and others; and as forms from new localities continue to be added to our collections, the difficulty becomes greater; and is further increased by the circumstance of young plants of large growing species producing fertile fronds when not more than an inch or two in height, which, with the intermediate states, have often been described as distinct species.

* Since the above was written, several stems and a male cone, with a few scales of apparently the female cone, have been exhibited at a meeting of the Linnean Society by Mr. Thomas Moore, who has, in Hooker's Journal of Botany, vol. v. p. 228, given to this plant the name of *Stangeria paradoxa*. More recently, plants have been received at the Royal Gardens, Kew, and further observations published by me at p. 88, vol. vi. of the same work.

1106. Asplenium *auritum*, Sw., Willd. l. c. p. 326. Woods near Panama.

Jamaica (Wiles, Purdie), Peru (Barclay), Brazil (Miers).

1107. Asplenium *rachirhizon*, Radd., l. c. t. 56. Southern Darien.

Brazil (Miers), Peru (Barclay).

The slightly broader segments, with the sori not marginal, distinguishes this from the *Cœnopteris rhizophylla*, Sm. (ic. ined. t. 50), which, with another form from Jamaica, can hardly be recognized as distinct species.

1108. Asplenium *formosum*, Willd., l. c. p. 329.—Presl, l. c. p. 107. Woods near Cruces.

Venezuela (Aldridge), Mexico (Liebold).

1109. Asplenium *pumilum*, Sw., Willd. l. c. p. 308.—Presl, l. c. p. 108. Hacienda de Boquete, Volcano of Chiriqui, Veraguas.

Martinique (Sieber), Jamaica (Purdie).

1110. Asplenium *Schkuhrianum*, Presl, l. c. p. 107.—*A. lætum*, Schk., Crypt. t. 70. (non. Sw.) Walls of Panama viejo.

Venezuela (Moritz, Otto).

The specimens before me have a starved-like appearance, which may be accounted for by their having been gathered from plants growing on old walls of the ruins of Panama viejo; it is, therefore, with some doubt that I refer them to this species.

1111. Asplenium sp.? (specimens imperfect). Volcano of Chiriqui, Veraguas.—1554.

Tribe V. Aspidieæ.

(J. Sm., in Hook. Jour. Bot. iv. 180.)

1112. Aspidium *macrophyllum*, Sw., Willd. l. c. p. 217.—Presl, l. c. p. 88. Bay of Cupica and Hacienda de Juan Lanas.

Jamaica (Heward, Wiles, Wilson), Brazil (Miers), Trinidad (Aldridge), St. Vincent (Caley), Martinique (Sieber).—v. v. Hort. Kew.

This is widely diffused over Tropical America and the West Indian Islands, assuming different aspects, consequent upon difference in age and locality.

1113. Aspidium *latifolium*, J. Sm. Jour. Bot. vol. iii. p. 410.—*Polypodium latifolium*, Forst. Willd. l. c. p. 205.—Schk. Crypt. t. 24.—*Sagenia latifolia*, Presl, l. c. p. 87. Southern Darien.

Tumaco, Central America (Barclay), Tahiti (Barclay), Luzon (Cuming), Sierra Leone (Don), Esmeraldas, Ecuador (Seemann).

This is also a wide-spread species, and, as might be expected, presents different appearances, but I cannot consider them otherwise than as phases of one species.

1114. Nephrodium *Cumingianum* (Tab. L.), Kunze in Schk. Crypt. t. 9. f. 2. Island of Coyba, coast of Veraguas.

Panama (Cuming), Chagres (Fendler in Herb. Hook.).

I long considered this to be the young state of a pinnate species, but the circumstance of its having been found in three distant localities at different periods of time, and always presenting the same

appearance, now induces me to view it as a species; but I cannot omit to notice its similarity to a form from the Philippines, named by me *Nephrodium simplicifolium* (Jour. Bot. vol. iii. p. 411), which I now know to be the young state of a pinnate species.

Plate L. Figs. 1 and 2, portions of fertile frond; 3, indusium; 4, perfect sporangium, and 5, abortive sporangium: all magnified.

1115. Nephrodium *molle*, R. Br. Prod. Fl. Nov. Holl. p. 149.—Presl, l. c. p. 81.—J. Sm. Gen. Fil. l. c. Common in the woods of the Isthmus.

Universally diffused over the tropical and extra-tropical regions of both hemispheres.—v. v. in Hort. Kew.

1116. Lastrea *invisa*, Presl, l. c. p. 75.—J. Sm. Gen. Fil. l: c. p. 193.—*Aspidium invisum*, Sw., Willd. l. c. p. 224. Near Panama.

Jamaica (Heward, Wilson).

1117. Lastrea *macroura*, Presl, l. c. p. 75.—*Aspidium macrourum*, Kaulf., En. Fil. p. 239. River Nuqui, Darien.

Martinique (Sieber), Venezuela (Otto).

1118. Lastrea *Sprengelii*, Presl, l. c. p. 75.—*Aspidium Sprengelii*, Kaulf., l. c. p. 239. Chirambira, Darien.

Martinique (Sieber), St. Vincent (Caley).—v. v. Hort. Kew.

1119. Lastrea *arguta*, J. Sm.—*Aspidium arguta*, Kaulf., En. Fil. p. 242. Panama (Barclay).

California (Barclay, Hartweg), Sandwich Islands (Barclay).

In determining whether certain specimens represent distinct species, or are only forms of one, we are apt to be influenced by the idea that plants of a species are seldom found inhabiting regions widely separated and distant from each other. It is not till a number of examples of allied forms are brought before us, that we begin to see the error committed by many botanists when enumerating the plants of a particular region or country, in forming new species, without ascertaining whether they may not be already described from some other region. In the present case, although I have adopted Kaulfuss' name of *arguta*, still I see no way of distinguishing it from the eastern forms (*L. macrocarpa* and *elongata*), which, on collating with others, including the well-known *L. Filix-Mas*, exhibit a series difficult to recognize as distinct species; the latter, even in this country, presents aspects as well entitled to rank as species as its foreign allies.

1120. Polystichum *vestitum*, Presl, l. c. p. 83.—*Aspidium vestitum*, Sw., Willd. l. c. p. 261.—Blume, En. Fil. Jav. p. 163. Volcano of Chiriqui, Veraguas.

v. v. Hort. Kew.

The group to which this species belongs may be considered as truly cosmopolitan, inhabiting elevated regions within the tropics, and extending to high latitudes of the temperate regions of both hemispheres, and assuming, according to the nature of the climate, various aspects; the extreme forms may readily be described as distinct species, but the transition from one form and aspect to another is such as to render it difficult, if not impossible, to determine them otherwise than as geographical allies of the European forms known by the names of *Polystichum lobatum* and *P. aculeatum*.

1121. Cyclopeltis *semicordata*, J. Sm., Bot. Mag. vol. lxii. (Comp. p. 36).—*Lastrea semicor-*

data, Presl, l. c. p. 97.—*Aspidium semicordatum*, Sw., Willd. l. c. p. 222.—*Hemicardion Nephrolepis*, Fée, Gen. Fil. p. 282. Near the village of San Juan, on trees.

Trinidad (Aldridge, Purdie), St. Vincent (Caley), Jamaica (Wilson).—v. v. Hort. Kew.

Cyclopeltis was first described by me as a genus in the Botanical Magazine for 1846. In 1852, M. Fée characterized the above species under the name of *Hemicardion Nephrolepis*, and quoted *Cyclopeltis* as a synonym, thus changing both the generic and specific name, and this he does without assigning any reason, it being another of the many instances in M. Fée's 'Genera Filicum' of names being changed and transposed without just cause, a practice serving only to create confusion.

Tribe VI. Dicksonieæ.

(J. Sm. in Hook. Lond. Jour. Bot. i. 419.)

§ *LINDSÆÆ*.

(J. Sm. l. c. 420.)

1122. Lindsæa *Seemannii*, J. Sm.; frondibus elongato-linearibus pinnatis, pinnis breve petiolatis dimidiato-oblongis subfalcatis, inferioribus distantibus minoribus, basi sursum truncatis, margine superiore inciso bi-trilobatis, lobis truncatis soriferis. Southern Darien and Bay of Choco.

Frondes cæspitosæ, 1½ ped. altæ, ¾ unc. latæ.

Allied to *L. Lobbianum*, Hook., a native of Java.

1123. Lindsæa *stricta*, Dry., Hook. Sp. Fil. vol. i. p. 216. Village of San Juan, province of Panama.

Tropical America generally; Venezuela (Aldridge, Otto), British Guiana (Schomburgk), Brazil (Barclay, Sellow), Santamarta (Purdie), Pará (Wallace), Taboga, West Coast of America (Barclay), Trinidad (Purdie).—v v. Hort. Kew.

1124. Lindsæa *horizontalis*, Hook., l. c. vol. i. p. 214. Panama.

1125. Lindsæa *trapeziformis*, Dry., Hook. l. c. vol. i. p. 214. Southern Darien and Bay of Choco.

Jamaica (Wilson), Trinidad (Purdie), Brazil (Barclay), British Guiana (Schomburgk), East Indies (Wallich), Malacca (Cuming).

1126. Dictyoxiphium *Panamense*, Hook., Gen. Fil. t. 62.—J. Sm. l. c. p. 422. Panama.

New Granada (Purdie), Panama (Cuming).—v. v. Hort. Kew.

With the exception of this genus and *Isoloma*, *Lindsææ* forms a very natural and distinct group of Ferns; the marginal sorus being the only character which *Dictyoxiphium* has in common with *Lindsææ*: its habit and mode of growth indicate it to be more nearly related to *Pteropsis* in *Polypodieæ*. *Isoloma* naturally associates with *Nephrolepis* and *Leptopleura* (Presl): the generic distinctions of these three genera depend upon the margin of the pinnæ being entire, more or less crenated or lobed, also in the soriferous venules terminating within the margin, or extending into the lobes; the lobes in the latter case assume the character of an accessory indusium, as in *Dicksonia*, in which tribe Presl has placed *Leptopleura*, but, in my opinion, the latter can scarcely be distinguished from *Nephrolepis*.

1127. Dicksonia *Sellowiana*, Hook., l. c. vol. i. p. 67. t. 22. B. Panama.

It is with some doubt that I refer the present specimens to *D. Sellowiana*, a native of Brazil, which,

with *D. Berteroeana* from Juan Fernandez, seems scarcely distinct from *D. Antarctica* of Australia and New Zealand; whether they are distinct species can only be satisfactorily determined by an examination of their several caudices, or even the base of the petiole, which unfortunately seldom accompany Herbarium specimens.

§ *TRICHOMANEÆ.*

(J. Sm., l. c. p. 429.)

1128. Trichomanes *membranaceum*, L., Hook. l. c. vol. i. p. 115. Cape Corrientes, Darien.

Islands of Trinidad (Aldridge, Purdie), St. Vincent (Caley), and Gorgona (Barclay).

1129. Trichomanes *spicatum*, R. Hedw., Hook. l. c. vol. i. p. 114. Chirambira.

Islands of St. Vincent (Caley), Jamaica (Purdie), and Gorgona (Barclay).—v. v. Hort. Kew.

1130. Trichomanes *crispum*, Linn., Hook. l. c. vol. i. p. 130. Near Panama.

Jamaica (Wiles, Wilson, Purdie), Trinidad (Purdie), British Guiana (Schomburgk), Santamarta (Purdie), Cocos Island, west coast South America (Barclay).

1131. Trichomanes *Ankersii*, Park., Hook. l. c. vol. i. p. 121. Chirambira, Darien.

Islands of St. Vincent (Caley), and Gorgona (Barclay).

1132. Trichomanes *Gourlianum*, Grev. MSS.; frondibus lanceolatis pinnatifidis stellato-pilosis, laciniis incisis subpinnatifidis, lobis oblongis obtusis, soris solitariis lineari-lanceolatis, indusiis bilabiatis, labiis oblongis apice dentatis mucronulatis. Panama.

This is only known to me by a few imperfect fronds, said to have been picked from amongst other specimens of this collection, and which had come to the notice of Dr. Greville, who observes that "it differs from both *Trichomanes Krausii* and *T. quercifolium* in the lips of the involucre;" this difference consists in the lip being much longer than in the two allied species.

1133. Trichomanes *radicans*, Sw., Hook. l. c. p. 125. Panama, in woods and on trees.

The numerous synonyms and habitats given under this species by Sir W. J. Hooker, in his 'Species Filicum,' show it to be a species spread very generally throughout the islands and continent of tropical and extra-tropical America; it is also found in the Azores, Teneriffe, Madeira, and in Ireland, and Nepal in India.—v. v. Hort. Kew.

1134. Hymenostachys *diversifrons*, Bory, J. Sm. l. c. p. 431.—*Trichomanes elegans*, Rudge, Hook. l. c. vol. i. p. 114. Panama.

Islands of Gorgona (Barclay), Trinidad (Purdie).

1135. Hymenophyllum *ciliatum*, Sw., Hook. l. c. vol. i. p. 88. Southern Darien, on trees.

Jamaica (Purdie), Mexico (Deppe).

Tribe VII. Cyatheæ.

(J. Sm., l. c. p. 659.)

1136. Hemitelia *petiolata*, Hook., l. c. vol. i. p. 31. t. 16. Island of Taboga, and Bay of Ardita.

Island of Gorgona (Barclay).

1137. Cyathea *integra*, J. Sm. *β. petiolata*, Hook. l. c. vol. i. p. 26.—*Cyathea petiolata*, J. Sm., En. Fil. Philipp. Jour. Bot. vol. iii. p. 419. Hacienda de Boquete, Veraguas.

Luzon, Mindanao (Cuming), New Ireland (Labillardière), Jamaica (Wiles, Purdie).

1138. Alsophila (§ Hymenostegia, *J. Sm. l. c. p.* 666) *tenera*, J. Sm., Hook. l. c. vol. i. p. Southern Darien.

St. Vincent (Caley).

1139. Alsophila (§ Hymenostegia, *J. Sm. l. c. p.* 666) *infesta*, Kze., Hook. l. c. vol. i. p. 42. Panama.

In many cases it is most difficult to determine the species of this genus, and errors often occur: this agrees with a specimen of *A. infesta* in Sir W. J. Hooker's Herbarium.

1140. Alsophila (§ Trichostegia, *J. Sm. l. c. p.* 666) *elongata*, Hook. l. c. vol. i. p. 43.—*Alsophila Tumacensis*, J. Sm. l. c. p. 667. Southern Darien and Bay of Choco.

Island of Tumaco, New Granada (Barclay).

The present specimens are nearly destitute of fructification, and with the broad laciniæ present a different appearance from my original specimens of *A. elongata;* nevertheless I believe that I am right in referring them to this species.

1141. Alsophila (§ Trichostegia, *J. Sm. l. c. p.* 666) *aspera*, R. Br.? Hook. l. c. vol. i. p. 39. —*Alsophila nitens*, J. Sm. l. c. Southern Darien.

Jamaica (Wiles, Purdie), St. Vincent (Caley).—v. v. Hort. Kew.

1142. Alsophila (§ Trichostegia, *J. Sm. l. c. p.* 666) *armata*, Presl, Hook. l. c. vol. i. p. 40. Islands of Taboga and Cacagual.

Jamaica (Wiles, Wilson, Purdie), Brazil (Miers), Gorgona and Cocos Islands, Central America (Barclay).

1143. Alsophila (§ Trichostegia, *J. Sm. l. c. p.* 666) *ferox*, Presl, Hook. l. c. vol. i. p. 41. Southern Darien.

Trinidad (Purdie), British Guiana (Schomburgk), Brazil (Miers), Island of Morro, near Tumaco (Seemann).—v. v. Hort. Kew.

1144. Alsophila (§ Trichostegia, *J. Sm. l. c. p.* 666) *pruinata*, Presl, Hook. l. c. vol. i. p. 47. —*Lophosoria pruinata*, Kunze in Index Filicum, p. 54. Southern Darien and Bay of Choco.

Jamaica (Wiles, Purdie), Brazil (Miers), Mexico (Liebold), Chile (Cuming).

In a note respecting this species in my 'Genera of Ferns' I have made the following observation: "This species differs in habit from the rest of the genus, having more the appearance of a large *Polypodium*, but the sori being furnished with articulated hairs, and the receptacle slightly elevated, induce me to retain it here." Sir W. J. Hooker, in the 'Species Filicum,' remarks that "in habit and appearance this is extremely distinct from any other *Alsophila*, and the receptacles are very slightly elevated, so that it must be considered but a doubtful species of the genus." Presl notices it as differing from the rest of the genus in not being arborescent; but this can only be while in a young state, for in the 'Species Filicum' it is described as attaining the height of 8 feet, and, judging by the growth of living specimens in the Royal Gardens at Kew, I have no doubt that in time, and under favourable circumstances, it may attain that height; but while increasing in height it also produces numerous offsets from the side of the stem, which

are remarkable in having the axis of development elongating in a downward direction: by this mode of growth a plant in time may become cæspitose, and lose its arborescent character. It also differs from all other species of *Alsophila* in the axis of vernation being densely covered with soft articulated hairs, analogous to *Cibotium* and *Balantium*, and also in the stipes being plane; in true *Alsophila* the vernation is densely squamose, and the stipes either muricate or more or less aculeate, their permanent bases giving the aculeate character to the stem of most of the species; therefore, seeing that this species does not well associate with *Alsophila*, I am of opinion it should be removed from that genus. In a general arrangement, Kunze's name *Lophosoria* may be adopted, and viewed as forming a connection between *Alsophila* and a group of *Polypodieæ*, of which *Phegopteris lachnopodia* is the type.

1145. Amphidesmium *rostratum*, Schott, Gen. Fil. Obs.—*Metaxya rostrata*, Presl, l. c. p. 60.—*Aspidium rostratum*, Humb.—*Alsophila rostrata*, Mart.—*A. blechnoides*, Hook. l. c. vol. i. p. 35. Bay of Ardita, Darien.

Islands of Trinidad (Aldridge) and Gorgona (Barclay), British Guiana (Schomburgk).

Gleicheniaceæ.

(R. Br., J. Sm. l. c. vol. ii. p. 115.)

1146. Mertensia *dichotoma*, Willd., Hook. l. c. vol. i. p. 12. (excl. syn. *M. Hookeri*, J. Sm.) Outskirts of woods, common.

Tropics generally.

1147. Mertensia *glaucescens*, Willd., Hook. l. c. vol. i. p. 11.—*M. Hookeri*, J. Sm. l. c. p. 115. With the preceding species.

Trinidad (Aldridge), St. Vincent (Caley), British Guiana (Schomburgk), Brazil (Miers).

1148. Mertensia *furcata*, Willd., l. c. p. 71.—*M. pubescens*, *β glabra*, Hook. l. c. vol. i. p. 8. Southern Darien and Bay of Choco.

West Indies and Tropical America, very general.

Schizæaceæ.

(Mart., J. Sm. l. c. p. 119.)

1149. Lygodium *volubile*, Sw., Presl, l. c. p. 103. *β*. pinnæ trilobatæ.—*J. Sm.* Southern Darien.

Very general throughout the West Indies and Tropical America.

The present specimens differ from those we have hitherto observed, in the conjugate pinnæ being trilobed, not pinnate, and having the appearance of an ally of *L. flexuosum*, Sw.

1150. Lygodium *venustum*, Sw., Presl, l. c. p. 105. Common all over the Isthmus.

Tropical America generally, varying much in the pinnæ being more or less divided and villose.

1151. Schizæa *elegans*, Sw., Willd. l. c. p. 88.—Presl, l. c. p. 77. In palm woods between Cruces and Gorgona.

Trinidad (Purdie, Aldridge), Brazil and Panama (Barclay).

1152. Anemia *dissecta*, Presl, Rel. Hænk. p. 74. t. 11. f. 4. l. c. p. 88. Savanas about Panama, growing under bushes.

Brazil (Miers), Jamaica (Purdie).

1153. Anemia *Seemannii*, Hook. in Lond. Jour. Bot. vol. vii. p. 564. t. 16. Nomen vernacul. "Culantrilla de Pozo." On rocks and walls, island of Taboga, and Province of Panama generally.

"A decoction of this plant is used by the women of the Isthmus for procuring abortion."—*B. S.*

1154. Anemidictyon *Phyllitidis*, J. Sm. l. c.—Presl, l. c. p. 93. Volcano of Chiriqui, Veraguas.

Brazil (Miers, Gardner), Mexico (Deppe).—v. v. Hort. Kew.

Presl describes seven species as belonging to this genus; but, from all I have seen, I am led to believe that probably only half that number may be considered as distinct species.

In *Anemiaceæ* the vernation is adherent, and, with the exception of *Anemia adiantifolia*, the fronds are produced in a fascicle from the apex of an erect or decumbent axis, which in some becomes a cæspitose cormus. In *A. adiantifolia* the fronds are distant and produced in a single series from an elongating creeping axis, which assumes the form of a rhizome; therefore, in order to mark the distinct habit of this species, I propose to separate it from *Anemia*, under the name of *Anemirhiza*.

1155. Danæa *alata* ?, Sw., Willd. l. c. p. 68.—Presl, l. c. p. 35. Southern Darien.

Owing to the specimens being in a young state, and not in fructification, I cannot be certain that I am right in referring them to *D. alata*.

LYCOPODINEÆ.

(*Auctore J. Smith.*)

1156. Lycopodium *cernuum*, Linn., Spring. Mon. Lycop. sp. 15. Islands of Cacagual and Chirambira, growing terrestrially.

Tropics generally.

1157. Lycopodium *dichotomum*, Sw., Spring. l. c. sp. 25. Common in the Provinces of Panama and Veraguas, growing epiphytically.

Brazil (Miers), Jamaica (Purdie), Sandwich Islands.

1158. Selaginella *sulcata*, Desv., Spring. l. c. sp. 153. In the neighbourhood of Panama, growing terrestrially.

Brazil.

1159. Selaginella *flabellata*, Linn., Spring. l. c. sp. 115. Near the Hacienda de Juan Lanas, growing terrestrially.

St. Vincent (Caley), Jamaica (Purdie), East Indies (Wallich).

1160. Selaginella *ferruminata*, Spring. l. c. sp. 167. Southern Darien and Bay of Choco, growing terrestrially.

1161. Selaginella *Menziesii*, H. et G., Spring. l. c. sp. 125. Santiago de Veraguas, growing on rocks.

Sandwich Islands (Menzies), Peru (Barclay).

It is with some doubt that I refer the present specimen to this species, the leaves being more closely imbricate, and the stem not red, as in my original specimens of *S. Menziesii*; but these differences may be owing to local causes.

1162. Selaginella *cuspidata*, Link, Spring. l. c. sp. 9. Volcano of Chiriqui, Veraguas, growing terrestrially.

Mexico (Parkinson).

EQUISETACEÆ.

(*Auctore J. Smith.*)

1163. Equisetum *ramosissimum*, Humb. et Bonpl.—Willd. l. c. p. 9. Volcano of Chiriqui, Veraguas.

MARSILEACEÆ.

(*Auctore J. Smith.*)

1164. Marsilea *quadrifolia*, Linn., Willd. l. c. p. 538. In swamps, common about Natá.

Temperate and tropical regions generally.

MUSCI.

(*Auctore W. Wilson.*)

1165. Mnium *rhynchophorum*, Hook., Icon. Pl. t. 20. fig. 3. Volcano of Chiriqui, Veraguas.

Distinguished from *M. rostratum*, its ally, by the oblong shape and closer texture of the leaves.

1166. Octoblepharum *albidum*, Hedw., Stirp. Crypt. vol. iii. tab. vi.—Bridel, Bryol. Univ. vol. i. p. 137. Panama.

1167. Macromitrium *mucronifolium*, Schwægr., Suppl. t. 170.—Bridel. Br. Un. vol. i. p. 795. Panama.

1168. Macromitrium *patens* (Wils. MSS.); ramis erectis elongatis subsimplicibus, foliis 5-fariis patulis lanceolato-ligulatis acutis carinatis margine subplanis denticulatis, perichætialibus erectis longe acuminatis, capsula elliptica microstoma lævi.

Rami sesquiunciales. *Folia* patula, flexuosa, siccitate torta, nervo tenui percursa, areolis majusculis prominulis guttulata; perichætialia apice setacea. *Seta* semiuncialis. *Capsula* badia, lævis, majuscula, ore contracta. *Peristomium* ignotum.

Distinguished from *M. quinquefarium*, Endl. et Mart. Fl. Bras., by the ligulate leaves. Described from a solid specimen with old capsule.

1169. Neckera *julacea*, Schwægr., Suppl. t. 245. Panama.

N. longiseta, Hook. Musc. Exot. t. 43, is only a variety of this species.

1170. Neckera *turgescens*, C. Müller.—*Pilotrichum?*, Bridel. Panama.

Allied to *N. imbricata*, Schwægr. Suppl. t. 165: leaves larger, more lax and spreading, more tumid, more obscurely apiculate; areolæ narrower. Specimens barren.

1171. Neckera *nigrescens*, var. ?, Schwægr., Suppl. t. 244 *b*. — Brid. Br. Un. vol. ii. p. 192. Panama.

Perhaps a distinct but nearly allied species, having serrulate leaves, more loosely imbricated and less concave. Specimens barren.

1172. Neckera *disticha,* Hedw., Stirp. Crypt. vol. iii. t. 22. — Brid. Br. Un. vol. ii. p. 243. Panama.

1173. Hypnum *cirrifolium,* var.?, Schwægr., Suppl. t. 218 *a.*—*Pilotrichum cirrifolium,* Endl. et Mart. Fl. Bras. Panama.

A state of the Moss with leaves on the creeping stem much acuminated and serrated, found sparingly with *Neckera turgescens,* C. Müller.

1174. Hypnum *papillosum,* var.?, Endl. et Mart., Fl. Brasil. p. 82. tab. 4. f. 2. Panama.

Perhaps a distinct allied species (found sparingly intermixed with *Hookeria Merkelii*): leaves shorter, less acuminate; inflorescence rare, monoicous, ♂ fl. very rare.—(*H. curtum,* Wils. MSS.)

1175. Hypnum *planum,* Schwægr., Suppl. t. 280 *a.*—Brid. Br. Un. vol. ii. p. 394. Panama.

1176. Hypnum *subsimplex,* Hedw., Brid. Br. Un. vol. ii. p. 357. With *Hookeria Merkelii.*

1177. Hypnum *Loxense,* Schwægr., Suppl. t. 259 *b.* Island of Taboga, city of Panama, and Cape Corrientes.

Two forms of the species: one with lax, widely-spreading leaves, and longer setæ; the other with secund, narrower, and more crowded leaves.

1178. Hookeria *Merkelii,* Endl. et Mart., Fl. Brasil. p. 64. tab. 3. fig. 1. Panama.

A large form of the species.—*Hookeria Merkelii* appears to have been repeated in Fl. Brasiliensis under the name of *H. pallida.*

1179. Hookeria *diffusa,* Wils. MSS.; *dioica,* caule procumbente longiusculo vage laxeque pinnato, ramis subsimplicibus compressis, foliis oblongo-ovatis acutiusculis subplanis apice grosse serratis (caulinis subinde productis acutis undulatis) binerviis, nervis dorso prominentibus, perichætialibus ex ovato longe acuminatis, seta elongata lævi, capsula nutante. Panama.

Caulis biuncialis et ultra, subpinnatus. *Rami* semunciales. *Folia* pallide viridia, glaucescentia, basi albida, laxe imbricata, lateralia erecto-patentia, reliqua subappressa; caulina interdum apice producta, acuminata, undulata; omnia apice grosse serrata, nervis binis validis dorso prominentibus fere ad apicem productis instructa, areolis majusculis subellipticis; perichætialia anguste acuminata, serrata, subenervia. *Vaginula* prominula, pilosa. *Seta* sesquiuncialis, rubra, lævis. *Capsula* pyriformi-oblonga, badia, cernua. *Operculum* rostratum.

Differs from *H. Crugeriana,* C. Müller, in the wider leaves and the single line of marginal serratures; and from *H. undata* in the dioicous inflorescence, and more conspicuous nerves of the leaf. It occupies an intermediate position between *H. undata* and *H. Merkelii.*

HEPATICÆ.

(*Auctore W. Mitten.*)

1180. Plagiochila *hypnoides,* Ldbg., Species Hepat.—*Plagiochila,* t. 7, Gottsche, Ldbg. et Nees, Synops. Hepat. p. 45. On the branches of trees, village of Cruces, Province of Panama.

1181. Plagiochila *crispula,* Nees ab E., Ldbg. Species Hepat.—*Plagiochila,* t. 28, Gottsche, Ldbg. et Nees, Synops. Hepat. p. 60. Amongst *Frullania cucullata,* Ldbg. et Gottsche.

1182. Lophocolea *muricata,* Nees ab E., Gottsche, Ldbg. et Nees, Synops. Hepat. p. 169. Creeping upon *Dumortiera hirsuta* (Sw.), Nees ab E.

This minute species has a very extensive range in South America, for specimens have been picked out of species of *Hookeria* from Venezuela and Rio Janeiro.

1183. Chiloscyphus *combinatus,* Nees ab E., Gottsche, Ldbg. et Nees, Synops. Hepat. p. 182. Amongst *Dumortiera hirsuta* and *Symphogyna circinata,* M. et N.

1184. Lejeunia *bicolor,* Mont. in D'Orbigny Voy. dans l'Amér. mérid. Crypt. p. 66.—*Phragmicoma bicolor,* Nees ab E., Gottsche, Ldbg. et Nees, Synops. Hepat. p. 294. Amongst *Plagiochila hypnoides,* Ldbg.; near the village of Cruces.

1185. Lejeunia *versicolor* [L. et Ldbg.], Mitten. — *Phragmicoma versicolor,* L. et Ldbg., Gottsche, Ldbg. et Nees, Synops. Hepat. p. 297. Creeping over *Frullania cucullata**.

1186. Lejeunia *Oerstediana,* Ldbg. MSS. On *Frullania cucullata,* Ldbg. et Gottsche.

1187. Frullania *hians,* L. et Ldbg., Gottsche, Ldbg. et Nees, Synops. Hepat. p. 414. Amongst *F. cucullata,* Ldbg. et Gottsche.

1188. Frullania *semivillosa,* Ldbg. et Gottsche, iidem et Nees, Synops. Hepat. p. 774. With the preceding.

1189. Frullania *falciloba,* Hook. fil. et Tayl., Gottsche, Ldbg. et Nees, Synops. Hepat. p. 423. Near the village of Cruces, on trees.

These specimens correspond entirely with those gathered in New Zealand and Tasmania.

1190. Frullania *Thuilleri,* Nees ab E., Gottsche, Ldbg. et Nees, Synops. Hepat. p. 434. In the same situation as the last.

1191. Frullania *cucullata,* Ldbg. et Gottsche, iidem et Nees, Synops. Hepat. p. 782. Growing intermixed with the preceding.

1192. Frullania *Brasiliensis,* Raddi, Gottsche, Ldbg. et Nees, Synops. Hepat. p. 458. With the preceding species.

1193. Symphogyna *circinata,* M. et N., Gottsche, Ldbg. et Nees, Synops. Hepat. p. 486. Intermixed with *Dumortiera hirsuta* (Sw.), Nees ab E.

1194. Metzgeria *furcata,* Nees ab E., Gottsche, Ldbg. et Nees, Synops. Hepat. p. 502. Creeping upon *Frullania cucullata,* Ldbg. et Gottsche.

1195. Dumortiera *hirsuta* (Sw.), R. Bl. et Nees, Gottsche, Ldbg. et Nees, Synops. Hepat. p. 543. Panama.

LICHENES.

(*Auctore Churchill Babington.*)

1196. Usnea *barbata,* Fries, Sched. Crit. fasc. ix. p. 34. Volcano of Chiriqui, Veraguas, barren.

1197. Ramalina *usneoides,* Fries, Lich. Europ. p. 468 (name only).—*Alectoria usneoides,* Ach.!

* *Lejeunia transversalis* (Sw.), Nees ab E., Gottsche Ldbg. et Nees, Synops. Hepat. p. 310. Tumaco. —*Lejeunia squamata* (Willd.), Nees ab E., Gottsche, Ldbg. et Nees, Synops. Hepat. p. 322. Creeping amongst *L. transversalis,* Tumaco, New Granada.

Lichen. Univ. p. 594. Near the city of Panama, on the branches of trees and shrubs, hanging down like *Tillandsia usneoides*, and resembling a beard; hence its popular name, *Barba del judio*.

The specimens are fertile, several inches long, and vary much in the breadth of the segments; they undoubtedly belong to *Ramalina*, to which genus Fries, in his index to the Dillenian figures, has incidentally referred the Acharian *Alectoria usneoides*. It is next to impossible to limit the species of *Ramalina* in a satisfactory manner. The Rev. W. A. Leighton, who has pursued the microscopical analysis of the *Lichens* with singular diligence, informs me that the sporidia of all the European species are alike. I should be much disposed to suspect that the present plant is a very narrow and elongated form of the *R. fraxinea*, being in fact intermediate between that species and *R. farinacea*, and agreeing more with the former in the length, with the latter in the breadth of the thallus. To this species may possibly be added, as a remarkable variety, *R. retiformis*, Tuck. Enum. N. Amer. Lich. p. 12 (*R. Menziesii*, Tayl.! in Herb. Hook.), in which the thallus is branched (by reason of perforation?) so as to resemble a net.

1198. Parmelia *perforata*, Ach., Meth. Lich. p. 217. Volcano of Chiriqui, Veraguas.

This *Lichen* seems to be very generally dispersed over the hotter and temperate regions of both hemispheres. The apothecia are imperforate in the specimen which I have examined. Sometimes the full-grown apothecia are both perforate and imperforate in the same individual, as in specimens collected in the Himalaya mountains by Messrs. Strachey and Winterbottom.

1199. Parmelia *punicea*, Ach., Meth. Lich. p. 167. Volcano of Chiriqui, Veraguas.

This species is very like *P. subfusca*, Ach., but the apothecia are bright red. The hypothallus is not visible in Dr. Seemann's specimen. Dr. Montagne observes that the differently-shaped sporidia effectually distinguish the two Lichens. See Montagne's Crypt. Cub. p. 209.

1200. Sticta *damæcornis*, Auctt., var. *macrophylla*, Church. Bab. MSS.—*S. macrophylla*, Delise, Stict. p. 110. t. 10. fig. 4.—Eschweil. in Mart. Fl. Brasil. tom. i. p. 213.—Fée, Essai sur les Crypt. des Ec. offic. p. 129. t. 33. fig. 1.—Engl. Bot. t. 2697. Bouquete, Volcano of Chiriqui, Veraguas; sterile.

Eschweiler (*ut supra*) and Taylor (Fl. Hib. p. 151) suggest that this plant is probably not distinct from *S. damæcornis*, and I have accordingly ventured to unite them. Different as extreme forms may appear, there are numerous intermediate states connecting the two so-called species. *S. macrophylla* occurs in Ireland, the East Indies, the Mauritius, and various parts of South America.

1201. Sticta *damæcornis*, Auctt., var. *rufa*, Church. Bab. MSS.—*S. rufa*, Delise, Stict. p. 47. t. 2. f. 4. Isle of Chirambira, Darien; fertile.

Delise has ranged this Lichen next to *S. aurata*, Ach., with which it has no affinity. I can see little difference between the *S. rufa* and the broader form of *S. macrophylla*, except in the colour of the upper and under surface; the apothecia, likewise, and their margins, are more or less tinged with red. The rutilant hue appears to be due to the situation or some other accidental cause, for it is clear, from one of Dr. Seemann's specimens, that the colour is sometimes glaucous green. This precise form occurs in Jamaica, in various parts of South America, and in the East Indies. Eschweiler (in Mart. Fl. Brasil.) has suggested that *S. rufa*, as well as *S. macrophylla*, are forms of *S. damæcornis*. To the same Lichen should be united, I think, a considerable number of Delise's species.

1202. Sticta *flavescens* Delise, Stict. p. 117. t. 11. fig. 47. Bouquete, Volcano of Chiriqui, Veraguas.

The figure and description of Delise apply well enough to the Lichen from Bouquete, but I have no

authentic specimen. The present species is nearly allied to *S. damæcornis*, and may even prove to be a variety of it. The upper surface is of a rather bright ochroleucous hue, rugose and scrobiculated (but less so than in the allied species, *S. faveolata*, etc.); laciniæ several times forked, corniculated at the apices, rather broad towards the base, *i. e.* the centre of the thallus. The under side is naked or sparingly clothed with brown pubescence; cyphellæ urceolated, tumid, externally yellowish, scarcely paler within; apothecia principally marginal, rather small, rufous, their margin at length erect, somewhat waved and crenulated.

1203. Sticta *peltigera*, Delise, Stict. p. 150. t. 18. fig. 68.—*S. dissecta*, Ach., pr. p. Hacienda of Bouquete, Veraguas; fertile.

The present plant is also found in other parts of New Granada and in Peru. Whether it is distinct or not from *S. dissecta*, Ach., I am unable to say, being unacquainted with his var. *corrosa* (*S. dissecta*, Delise).

1204. Sticta *Seemannii*, Church. Bab. MSS.; fronde stipitata flabellata laciniata glauca passim rufescente, laciniis elongatis linearibus subcanaliculatis repetitim dichotomis superne tantum subcostatis, marginibus undulatis integerrimis, subtus omnino nuda fuscescente, cyphellis minutissimis profunde immersis bullatis albis, stipite brevi lignoso crassissimo, apotheciis marginalibus elevatis liberis, disco nigricante margine tenui subflexuoso pallido ferrugineo-fusco. Volcano of Chiriqui, Veraguas.

A handsome Lichen, which I am not able to refer safely to any described species, although it is just possible that it may be a form of *S. filicina*, Ach. The lobes of *S. filicina* are much less elongated (being sinuated and scarcely dichotomous), and are erose and crenate at the extremities; the under side is of a bright ferruginous colour, and the costæ extend to the extremities of the lobes; the apothecia in fine are red. *S. latifrons*, A. Rich.! (*S. Menziesii*, Hook. fil.! et Tayl.!) is likewise allied to *S. Seemannii*; it has, however, very broad and little divided fronds; the apothecia are scattered over the surface, and the cyphellæ are very large and not bullated; it is pubescent beneath. *S. marginifera*, Mont.!, is barren, and may possibly be the present species: the specimen in the Hookerian herbarium is small and unsatisfactory. Dr. Seemann's specimen spreads like a fan, from a thick stipes about an inch long; the circumscription of the frond is nearly semicircular, the radius being from four to five inches, with an irregularly wedge-shaped base. The ramification is not unlike that of *Sticta damæcornis* or *S. macrophylla*, but it is more repeatedly forked. The upper surface is concave, glaucous green, tinged with red towards the base; the under side is black near the stipes, passing off into a pale ferruginous brown, perfectly naked; the apothecia are all marginal, almost stipitate, and the disc black.

SUPPLEMENT.

(*Containing Additions and Corrections.*)

BIXINEÆ.

Hisingera *nitida*, Hellen., Wlprs. Rep. vol. v. p. 57. Volcano of Chiriqui, Veraguas.

Hisingera *intermedia*, Seem.; fruticosa, inermis (an semper?), ramulis verrucosis, foliis alternis breviter petiolatis elliptico-oblongis, basi angustatis, apice acuminatis, obtuse serratis, utrinque glabris nitidis, coriaceis, floribus hermaphroditis in racemos simplices 8–10-floros dispositis, pedunculis pedicellisque pubescentibus, stigmatibus 3, bacca 3-sperma. Near the village of San Lorenzo, Veraguas.

A shrub, about 10 feet high; leaves from 4 to 5 inches long, and from 1½ to 2 inches broad; racemes about 1½ long; calyx with four sepals; sepals oblong, obtuse.—This species seems to be intermediate between *H. nitida*, Hellen., and *H. racemosa*, Sieb. et Zucc., having the foliage of the former and the inflorescence of the latter; but its chief peculiarity consists in bearing hermaphrodite flowers, and having three stigmas.

VIOLACEÆ.

27. Tetrathylacium *macrophyllum*, Pœpp., Nov. Gen. et Sp. vol. iii. p. 34. t. 240.—*Edmonstonia Pacifica*, Seem., supra, p. 98. t. 18!

The plant to which I gave the name of *Edmonstonia* has already been described by Pœppig, who, judging from more perfect materials than those at my disposal, places it among *Violaceæ*, close to *Alsodeia*. It will be observed that the organs I considered as bracts and calyx, Pœppig looks upon as calyx and corolla. There are however several discrepancies between Pœppig's and my illustration; some of which may be easily reconciled, Pœppig's specimens having been old, mine very young ones; but there are others, such as the number of placentæ, etc., which, in the absence of better specimens than those I at present possess, it is impossible to reconcile. I can only state that both my figure and description are as faithful as from the material accessible they could be made.

TERNSTRŒMIACEÆ.

94. Saurauja *Veraguasensis*, Seem.—*S. montana*, Seem., supra, p. 87. t. 16!

This change of names became necessary, as the name *montana* had already been given to a Javc plant of the same genus.

RUBIACEÆ.

I have mentioned that *Pentagonia* is the only Rubiaceous genus with pinnatifid leaves; and I may add that there is an East Indian plant (*Carlemannia Griffithii*, Benth., in Hooker's Journ. of Bot. and Kew Misc., vol. v. p. 308) to which Mr. Bentham has drawn my attention, and which has serrated leaves, so that we can no longer say that *all Rubiaceæ* have entire leaves, since three plants (*Pentagonia Tinajita*, *P. pinnatifida*, and *Carlemannia Griffithii*) form exceptions.

COMPOSITÆ.

549. Pectis *filipes*, Harvey et Gray.

"After comparing an original specimen of Coulter's collection, for which I am indebted to my friend Professor Asa Gray, I am convinced that Dr. Seemann's plant, collected about Panama, is a different, though in habit nearly allied species. It differs from the true *Pectis filipes*, Harv. et Gray, in its leaves being more oblong than linear, more acute at the summit, and more scabrous at the margin; in the shorter and less capillary peduncles, which are furnished with one or two squamæform bracteolæ, and are said to be without bracts in *P. filipes* (though I observe in the middle of each peduncle, in Mr. Coulter's own specimen, indeed a very small inconspicuous bract-like scale); in the involucre consisting of 6–8 (not 5) scales; in somewhat shorter and less golden-coloured ligulæ, and particularly in the pappus being very short and coroniform, consisting of small unequal rather obtuse chaffs, seldom becoming, by a little longer bristle, subuniaristate. In *P. filipes* the awns of the pappus, mostly two in number, are of a much stronger shape and larger size. Dr. Seemann's plant however, having no ripe achænia, remains somewhat doubtful, unless it is a puberulous form of *Pectis Swartziana*, Lessing (in Linnæa vol. vi. 1831, p. 711. n. 6. DC. Prodr. vol. v. p. 99. n. 2), the detailed description of which well agrees with it. An original specimen of the West Indian plant, however, I have never seen."—*Joachim Steetz.*

CRESCENTIACEÆ.

779. Parmentiera *cereifera*, Seem. Seem. Revision of the Genera *Crescentia, Parmentiera,* and *Kigelia,* in Hook. Journ. Bot. and Kew Misc. vol. vi. p. 273.

The *P. aculeata*, Seem., mentioned at p. 183 of this Work, is identical with *P. edulis*, De Cand., a species to which must also be added as synonyms, *Crescentia aculeata*, H. B. K., *C. edulis*, Moz., *C. edulis*, Desv., and *C. musæcarpa*, Zaldivar.

780. Crescentia *Cujete*, Linn., Seem. l. c. p. 275.—*C. acuminata*, H. B. K.—*C. angustifolia*, Willd. mss. in Herb. Willd. sub n. 11,485 ! Nomina vernacul., in Cuba, sec. Ed. Otto, "Guido," in Mexico, sec. C. Heller, "Arbol de hicara" v. "Arbol de jicara."

Geographical distribution: Jamaica (P. Browne, in Herb. Linn. prop.! W. Wright!), Cuba (Humboldt and Bonpland!, Ed. Otto!), Santa Lucia (Herb. Mus. Brit.!), Guiana (Aublet!), Brazil (Blanchet!), Puerto Cabello (Karsten!), Cartago de Quindiu (Boussingault!), Peru (Dombey!).

781. Crescentia *cucurbitina*, Linn., Seem. l. c. p. 274.—*C. latifolia*, Lam.!—*C. lethifera*, Tussac ! —*C. toxicaria*, Tussac !—*C. ovata*, Burrm. !

Geographical distribution: Jamaica (W. Wright! Swartz in Herb. Willd. n. 11,486!), Cuba (Ed. Otto!), St. Thomas (Moritz!), San Juan (Moritz!).

782. Crescentia *alata*, H. B. K., Seem. l. c.—*C. trifolia*, M. Blanco !

Geographical distribution: Grows spontaneously in Western Mexico, from Acapulco to Mazatlan (Seemann! Humboldt and Bonpland! Gregg, n. 944! Ehrenberg! who found it at Itztoluca); cultivated in the Philippine (M. Blanco) and the Mariana Islands (Gaudichaud!).

GESNERIACEÆ.

788. Nautilocalyx *Panamensis*, Seem.—*Scheeria? Panamensis*, Seem., supra, p. 185 !

By separating the doubtful species *Panamensis* from *Scheeria*, the genus will be reduced to two spe-

cies, both of which have either purple or blue flowers; the term "albidis" in the natural description ought therefore be left out.

790. COLUMNEA *bilabiata*, Seem.

Dr. J. Hanstein considers this species as a true *Columnea*, and says, in a letter to me:—"Die Blume der *C. bilabiata* entspricht meiner Ansicht nach dem Typus der wahren Columneen, der besonders in der eigenthümlichen Physionomie liegt, welche durch Verwachsung der beiden seitlichen Lappen der Unterlippe mit der Oberlippe veranlasst wird. Der mittlere untere Lappe bleibt frei, und die verwachsene Oberlippe ist an der Spitze abgestutzt, und vornüber zusammengeneigt. Freilich sind alle diese Kronentheile weniger tief gespalten als bei *C. Schiedeana* und Verwandten, jedoch besitze ich eine ganze Reihe südamerikanischen Species, welche alle nicht tiefer gespalten sind, während andere eine vollständige Uebergangsreihe zu den tief-getheilten Formen darstellen, so dass man auf die mehr oder weniger tiefe Theilung des Kronensaumes keine Trennung der Gattung *Columnea* begründen kann. Da überdies nur eine Dorsaldrüse vorhanden [und nicht wie es durch einen Schreibfehler in meinem Texte heist: 'glands about 5.'—*B. Seem.*], und auch die Staubgefässe, so wie die ganze gradröhrige Gestalt der Krone gut passen, auch ein so zähnig-eingeschnittener Kelch bei den verwandten Arten vorkommt, so möchte ich dafür halten diese *Columnea bilabiata* als ächte *Columnea* gelten zu lassen."

CUPULIFERÆ.

890. QUERCUS *aristata*, Hook. et Arn.

The specimens I considered as belonging to this species, Professor F. Liebmann thinks belong to two different and distinct ones, which he has named and described as follows:—

QUERCUS *Seemannii*, Liebm. MSS.; ramulis angulatis sulcatis glabris; foliis coriaceis brevi-petiolatis lanceolatis acuminatis acutis integerrimis basi cuneatis interdum parum obliquis, margine cartilagineo, nervis utrinsecus 8–9 ante marginem arcuato-anastomosantibus subtus prominentibus, tenuissime reticulato-venulosis, supra nitidis glaberrimis, subtus (in siccis) fuscescentibus ad costam et axillas nervorum villo detergibili rufo e pilis stellatis formato dense obsitis demum glabrescentibus, petiolo leviter canaliculato glabro; fructibus geminis pedunculatis, glande subglobosa apiculata adpresse villosa demum glabrescente, cupula hemisphærica dimidiam partem glandis obtegente, squamis arcte imbricatis obtusis adpresse rufo-villosis glabrescentibus, pedunculo petiolum 2–3-plo superante. Coll. Seemanni, n. 1228 in Hb. Hookeri. Febr. Mart. 1849. Specimina florentia et fructificantia. —Volcano of Chiriqui, Veraguas.

Ramuli atropurpurei, lenticellati. *Gemmæ* parvæ, ovatæ, obtusæ, glabræ, nitidæ. *Folia adulta* 2–4″ longa, ½–1½″ lata, petioli 1–2‴ rarius 3–4‴ longi. *Folia juvenilia* utrinque, petioli, pedunculi amentorum villo griseo detergibili e pilis stellatis formato obducta. *Amenta* mascula gracilia, laxe spicata, 1–1½″, flores minuti, involucri squamæ 4–5 ovatæ obtusæ extus villosæ; *stipulæ* lineari-lanceolatæ, 3–4‴, scariosæ, extus villosæ, deciduæ. *Pedunculi* fructus excreti 6–8‴ crassiusculi glabri. *Glans* magnitudine Pruni spinosi drupæ.

Obs. Species valde affinis *Q. conspersæ*, Benth., speciei summopere polymorphæ, a qua tamen distinguitur foliis minoribus subtus fuscescentibus nec lutescentibus, nervis paucioribus et minus prominentibus, basi minus obliquis, petiolo breviori pedunculo longiori et crassiori, glande globosa, stigmatibus brevioribus latioribus minus recurvis, tubo stylino longiori.

QUERCUS *bumelioides*, Liebm.; ramis albicantibus verrucosis, ramulis gracilibus angulatis sulcatis; foliis approximatis coriaceis brevipetiolatis obovato-lanceolatis obtusis apice sæpe leviter emargi-

natis basi cuneatis integerrimis margine cartilagineo leviter revoluto, nervis utrinsecus 8–9 ante marginem arcuato-anastomosantibus subtus prominulis, venulis transversalibus anastomosantibus, utrinque glaberrimis solummodo subtus in axillis nervorum parce barbatis, petiolo glabro supra applanato, stipulis deciduis linearibus obtusis ciliatis extus pubescentibus, fructu . . . Volcano of Chiriqui, Veraguas.

Folia adulta 2¾–4″ longa, 1–1½″ lata, petioli 2–3‴, stipulæ 4‴. *Folia juvenilia* ciliata, cæterum glabra. *Gemmæ* ovatæ, squamis dense imbricatis obtusis glabris scariosis ciliatis concavis. *Amenta* masc. gracilia, 1–1½″; flores dense spicati, squamæ involucri ovatæ obtusæ concavæ scariosæ ciliatæ.

Obs. Species imperfecte nota, cum fructus latet. E foliorum forma ad *Q. ellipticum* nec accedit.

891. Quercus *glabrescens?* Benth.

The sterile specimens from Chiriqui, which I referred with a mark of doubt to *Q. glabrescens*, Benth., Prof. Liebmann describes as—

Quercus *Warszewiczii*, Liebm.; ramulis stellato-villosis rufis; foliis membranaceis brevipetiolatis magnis obovatis acuminatis ultra medium grosse dentatis, dentibus obtusis calloso-mucronulatis, basi cuneatis integris, nervis lateralibus utrinsecus 16–20 parallelis excurrentibus, supra glabris secus costam dense stellato-pilosis, subtus imprimis secus nervos venasque stellato-pilosis, petiolis brevibus crassis dense pilosis rufis, stipulis linearibus adpresse rufo-pilosis; glande solitaria magna pedunculata oblonga utrinque truncata glabra, apice umbilicato-impressa apiculata, basi umbone magno notata, cupula cyathiformi tertiam partem glandis obtegente, squamis arcte imbricatis lanceolatis acutis glabris, pedunculo longo.—Coll. *Warszewiczii* no. 50ª in Hb. reg. Berol. c. fr.! Guatemala, Costa Rica. Coll. Seemanni, n. 1230 et 1572 in Hb. Hookeri, Febr. 1849 (sterilis). Volcano of Chiriqui, Veraguas.

Ramuli obtuse angulati, sulcati, pilis simplicibus et stellatis rufis dense villosi. *Gemmæ* ovatæ, obtusæ, glabræ, nitidæ, squamis dense imbricatis ovatis obtusis concavis. *Folia* maxima, membranacea, 6–10″ longa, 3–4″ lata, brevipetiolata, obovata, acuminata, ultra medium grosse dentata, nervis utrinque 16–20 patulis subtus valde prominentibus venisque transversalibus anastomosantibus reticulatis, petiolo 2‴ longo; stipulæ 5‴; glans 12–14‴ alta, 10–11‴ in diametro; cupula 9‴ alta, 3½″ in peripheria; pedunculus 2″ longus, pennam anserinam crassus.

Obs. Specimen Seemanni, n. 1572 in Hb. Hookeri, sterile, folia multo minore (4–6″ longa, 1½–1¾″ lata) exacte foliis *Q. corrugatæ*, Hook., similia habet, sed indumento rufo stellato-piloso facile ad speciem nostram referendum. Species affinis ut *Q. corrugatæ*, Hook.

CYCADEÆ.

916. Zamia *Skinneri*, Warsz.

Mr. Yates has supplied the following additional notes:—"November, 1854. Having succeeded in growing *Zamia Skinneri*, I am able to add the following account of it. The stem has become perceptibly thicker as well as longer. Three leaves rose in 1852, four in 1853; the leaves of 1853 larger than those of 1852. In the following account of the larger set of leaves I omit the repetition of the circumstances in which this species agrees with others (*e. g. Z. Chigua*, already described), and I confine myself to those characters which are peculiar and distinctive.

"Length of the entire rachis 50 centimetres, of which the stalk is 30. Leaflets 8, slightly converging in the direction of the apex of the leaf; set obliquely on the channels of the rachis, the obliquity increasing towards the apex. Prickles on the stalk short and thick, not very abundant, not continued above the origin

of the leaflets. Leaflets ovato-lanceolate, remote from one another. Section of the base of the leaflet and of its articulation elliptical. About 26 nervures at the widest part of the leaflet, united into two bundles at the base, but bifurcating at different distances until they reach the middle, or widest part, of the leaflet; after which they all terminate in sharp, strong, marginal spines, which still maintain the same direction towards the apex. The central nervures converge towards the apex, the others being in general parallel. Largest leaflet 29 centimetres long, 8 c. wide. Interval between two nervures about 3 millimetres, the nervures being prominent on the under surface of the leaflet, with a corresponding depression on the upper surface, which causes the parenchyma between the nervures to assume the form of an arch. This gives *Z. Skinneri* an extraordinary appearance, by which, and by the small number and great size of its leaflets, it is distinguished in a very marked manner from every other species. Colour of the leaves bright green and glistening. *Vernation.*—The young leaf rises quite erect. The stalk increases rapidly, so that, when two months old, it is covered with a short, soft, whitish down, muricate, the nascent spines being white, soft, and blunt, irregularly dispersed. During this period the four pairs of leaflets grow much more slowly; they are orbicular, and folded over one another with an imbricate vernation; the nervures downy, doubly dichotomous, so thick as to occupy the whole under surface of the leaflet, though distinguished by depression between them. When the young leaf has attained to about half its ultimate length, by the rapid elongation of the stalk, the blade takes its turn. The leaflets proceed in their growth, increasing much more rapidly in length than in breadth: their increase in breadth is affected by the evolution of parenchyma with cuticle between the nervures, and their elongation by additions to the length of the nervures; thus the form of the leaflet is changed from orbicular to elliptical and lanceolate. The leaf is fully developed in about four months. This year (1854) my plant has put up no more leaves, but it has produced four cones, proving it to be a male. These, like the leaves, have risen in succession, not simultaneously; they are of different sizes; they resemble very much the cones of *Z. Chigua*, but are less exactly cylindrical, tapering towards the top and bottom. The cones are much smaller than those of *Z. Chigua*, already described; but the cause of this, in my opinion, is that my plant is, comparatively speaking, a young one; I have no doubt that a full-sized male plant of *Z. Skinneri* would have cones as large as those of *Z. Chigua*. These cones agree with those of *Z. Chigua* in the position of the anthers on the two sides of the scale. In concluding this account I would observe that my plant is admired by every one, not only on account of its rarity and its very marked distinctive characters, but for its handsome and striking appearance."

915. Zamia *pseudo-parasitica*, Yates, supra, p. 202.

"In May 1853, I received from Dr. Joseph D. Hooker a leaflet of a plant from the eastern side of the Andes of Peru, which appears to be a *Zamia*, intermediate between *Z. Chigua* and *Z. Skinneri*. I mention it here because it is the only Cycad, except *Z. Skinneri*, in which I have seen the peculiar appearance produced by the prominence of the nervures on the under surface of the leaflet. The form of the leaflet is lanceolate and falcate; length 52 c., breadth 3 c.; 18 strong nervures in the wide part of the leaflet, another nervure forming each margin. No appearance of teeth or spines in the margin."—*James Yates.*

It was first thought by Mr. Yates that the leaflets mentioned did not belong to *Z. pseudo-parasitica*, but I have since ascertained that they do. Warszewicz has given two stations for this plant, Chagres, and the eastern side of the Andes. I have never seen this species in the Isthmus, and as it is stated only that the specimens were sent from Chagres, whilst in the Hookerian Herbarium they are marked "eastern side of the Andes," *Z. pseudo-parasitica* must be regarded as a doubtful member of the Flora of the Isthmus of Panama, until additional evidence has been adduced.—*B. Seemann.*

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corrected page

Further Additions and Corrections, June 8, 1857.

81. Prockia *Crucis*, Linn., De Cand. Prodr. vol. i. p. 260 = *Kellettia odorata*, Seem., supra, p. 85 !

82. Sloanea *quadrivalvis*, Seem., supra, p. 85. t. 15 = *Dasycarpus quadrivalvis*, Örsted in Naturh. Foren. Videnk. Meddeleser!

Örsted has made a new genus of this species; he also found at Guanacaste, in Central America, a variety of it—*Dasycarpus quadrivalvis*, var. *obovata*.

106. *Read* Renggeria *instead of* Reggeria.

138. Tetrapteris *Panamensis*, Seem., supra, p. 92 = *Hiræa Kunthiana*, Adr. Juss. !

My specimens had no fruit, which was the chief reason of my mistaking the genus; but my friend Professor Grisebach, when he saw them in Herb. Hook., at once identified them with *H. Kunthiana*.

154. Moschoxylon *Veraguasense*, Seem., supra, p. 93 = *Mauria puberula*, Tulasne, in Ann. Sc. Nat. 1846. p. 363 !

440. Begonia *hernandiæfolia*, Hook. = *B. coriacea*, Hassk., *B. Hasskarlii*, Zoll., *Mitcherlichia coriacea*, Klotzsch, Begoniæ, p. 74 !, is a native of Java, to be excluded from the 'Flora of the Isthmus of Panama.'

The statement in the 'Botanical Magazine,' that I had sent seeds of this plant from the Isthmus, is traceable to an accidental misplacement of labels in the Royal Botanic Gardens at Kew. There are no specimens of it in my collection.

873. Urera *girardinioides*, Seem., supra, p. 194 = *U. laciniata*, Weddell, in Archiv. du Mus. tom. ix. p. 160. no. 15 !

My name has the priority, having been published in 1854; Weddell's was not made known until 1856.

907. Arthanthe *septuplinervia*, Miq., supra, p. 199. Chagres (Fendler, n. 270 !).

933. Phytelephas *macrocarpa*, Ruiz et Pav., supra, p. 205.

Dr. Karsten, who however only knew the abstract of my notes on *Phytelephas*, given in 'Bonplandia,' vol. iii. p. 270, has advocated in the 'Linnæa' the necessity of dividing *P. macrocarpa* in more than one species, in which I cannot follow him, because I do not see that the proofs adduced by him are conclusive. Some critical remarks on my notes have also been published in 1856 by Grisebach, in his excellent 'Bericht über die Leistungen in d. Geograph. und System. Bot. während d. Jahr. 1853,' p. 83.

Urospatha *grandis*, Schott, in Bonplandia, vol. v. p. 128. Chagres (Fendler !).

Cyperaceæ et Gramineæ, supra, p. 221, 223.

The German observations with which Dr. Nees von Esenbeck's synopsis of the above Orders were accompanied, have since been published in 'Bonplandia,' vol. iii. p. 83.

FLORA

OF

NORTH-WESTERN MEXICO.

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HISTORICAL NOTICE.

Numerous are the names of those who, since the days of Cortez, have made the vegetation of Mexico their study, and great the materials which, by their respective labours, have been accumulated. Still the exploration of the country, in a botanical point of view, is far from being accomplished, and an enumeration of all the members of its Flora, or even a synopsis of all that has hitherto been done in that direction, remains one of the desiderata of science. With the exception of Italy, Greece, and Portugal, all civilized countries have sent explorers hither. At first it was Spain exclusively which supplied them, the venerable Hernandez being one of the most popular representatives of that class; then it was Germany and France, a little later England, Denmark, and Russia, and finally the United States of America.

The first English expedition was that of H.M.S. Blossom, commanded by Captain F. W. Beechey, R.N., accompanied by Mr. Tradescant Lay, naturalist, and Mr. Collie, surgeon, both of whom made considerable collections of plants, which however did not arrive in England in a satisfactory condition, and they were moreover mixed up with those of Loo-Choo, a state of things which gave rise to some confusion; nevertheless they were turned to the best advantage by Sir William Jackson Hooker and Dr. G. A. Walker Arnott, who published them in their well-known work, 'The Botany of Captain Beechey's Voyage.'* The specimens were gathered from December, 1827, to the 8th of February, 1828, about San Blas,

* The Botany of Captain Beechey's Voyage, comprising an Account of the Plants collected by Messrs. Lay and Collie, and other Officers of the Expedition, during the Voyage to the Pacific and Behring's Strait, performed in H.M.S. Blossom, under the command of Captain F. W. Beechey, R.N., etc., in the years 1825, 26, 27, and 28, by Sir W. J. Hooker, etc., and G. A. Walker Arnott, Esq., etc. Illustrated by numerous plates. 4to. London, 1841.

on the coast, and in the vicinity of Tepic, fifty-four miles inland, where Lay remained a considerable time, and found most of the new species described by the Authors; a good number were also collected at Mazatlan in February, and at Acapulco in April, 1828.

The second English expedition consisted of H.M.S. Sulphur, commanded by Sir Edward Belcher, R.N.; George Barclay, botanical collector, Richard B. Hinds and Dr. Sinclair, surgeons, were attached to it, and by them the botanical collections were formed, chiefly between San Blas and Tepic, in December, 1837, and at Acapulco in January, 1838. Sinclair transmitted his collections to England whilst the publication of the 'Botany of Captain Beechey's Voyage' was still going on, and they found a place in the supplement of that work; but as they formed part and parcel of the expedition of H.M.S. Sulphur, they were very properly taken up again by Mr. George Bentham, in the 'Botany of H.M.S. Sulphur,'* a work for which Mr. Hinds's collections formed the chief basis. Those made by Mr. Barclay were principally sent to the British Museum, and have in part been published, which is the more to be regretted, as they are reported to have been extensive.

The third English expedition consisted of H.M.S. Herald, commanded by Captain Henry Kellett, R.N. It touched at the western coast of Mexico in three different years, viz. 1846, 1848, and 1849. In 1846, when Mazatlan, San Blas, Siguantenejo, and Acapulco were visited, no botanical collections were formed, the vacancy caused by the death of Mr. Edmondston, the naturalist, not having at that time been filled up; but in 1848 and 1849 the Author had joined the expedition, and was able to collect, principally during two journeys in the interior of the country, the material which forms part of the 'Flora of North-western Mexico.'

The first journey was very limited, as the 'Herald,' which anchored in the port of Mazatlan on the 26th of November, 1848, was only to remain a few days. I left the port without delay, as the vegetation of the coast did not present many novelties, and directed my way to San Sebastian, a small town, where, as I had been informed that it was situated considerably above the ocean, I expected to find a richer Flora than at Mazatlan. In that expectation however I was in a great measure disappointed, there being little change, as the elevation of the place above the sea did not amount to more than 1000 feet. Fortunately Don Alejandro Bueso, a gentleman to whom I had a letter of introduction, took some interest in botany, and made up for my disappointment by conducting me, on the following day, to the Hacienda de las Naranjas, a farm on the foot of the Cerro de Pinal, where we stayed two days, and found in the neighbourhood a fine mountain vegetation,—Pines and Oaks in the greatest profusion. I returned by the same way I had come, passing the villages of Santa Catarina and Nanches, and the town of San Sebastian and El Presidio de Mazatlan, and reached the ship in good time. The 'Herald' lifted anchor on the 4th of December, gained

* The Botany of H.M.S. Sulphur, under the command of Captain Sir Edward Belcher, R.N., etc., during the years 1836–42. Edited and superintended by Richard B. Hinds, Esq., Surgeon, R.N., attached to the Expedition. The botanical descriptions by George Bentham, Esq. 4to. London, 1844.

San Blas two days after, but only stopped a few hours to take in a supply of wood and water.

The second journey, being more extensive, was more productive in a botanical point of view: it was after the 'Herald's' second voyage to the Arctic regions. The vessel was to make a hydrographical survey of the Gulf of California; and as that operation did not hold out many advantages for the increase of our collections, I proposed visiting the towns of Durango and if possible Chihuahua, where I hoped to effect a meeting with Mr. Potts, the manager of the Mint of that place, and at the same time an ardent collector of plants. Captain Kellett having agreed to this plan, I started from Mazatlan on the 23rd of November, 1849, and on the same day reached San Sebastian. The road, after traversing for several miles tiresome Mangrove swamps, ascended slightly, but became hardly more interesting. It being the dry season, most plants were either leafless or burnt up, and only a very few in flower. Having visited San Sebastian in 1848, I remained but a day at that place, taking up my quarters with my friend Don Alejandro Bueso. The forenoon of the following day I passed through Maguei (Agave) plantations, remarkable for their stiff and uncouth appearance; in the afternoon the landscape became more varied. I came to the foot of the Andes, or Sierra Madre, as they are here termed. The oppressive atmosphere of the coast was less felt at every step; the air became cooler and more agreeable to a European constitution; the excessive dryness however continued. On the 26th I reached the village of Copala, and on the following day that of Santa Lucia, one of the most charming places, on account of its situation, I have seen in Mexico. Leaving Santa Lucia I passed Ocotes, a place deriving its name from the *Ocote*, a Fir from which pitch is made, and reached, on the 1st of December, the Rancho of Guadalupe, situated about 6000 feet above the sea.

In ascending towards the top of the Sierra the temperature had gradually decreased, but fortunately not fallen to the freezing-point. On proceeding however everything partook of a wintry aspect, and I became soon aware that my principal harvest was over. At about 8000 feet the Evergreen Oak disappeared, Firs being the only trees then met with. Of herbage nothing remained but brown leaves; and the little streams which, at a lower elevation, had given variety to the sylvan scene, were covered with ice one to two inches thick. The nights were bitterly cold, and in vain did I try to get a few hours' sleep: it was impossible, even near the fire. I continued my journey over large plains, passing Cayotes, Salto, Llano Grande, Navios, Los Miembres, and Rio Chico, all collections of a few miserable huts, at which the traveller obtains, at high charges, *tortillas de maiz* (corn-cakes) for himself, and Indian corn for his animals. To cross these elevated plains is rather dangerous at this season: sudden snow-storms and, throughout the year, attacks from highway robbers and wild Indians are common occurrences; indeed in every mile of the road you observe one or more heaps of stones, with a wooden cross on the top, indicating the spots where people have been slain by the hands of robbers.

In the city of Durango I was hospitably received by Mr. Washington Kerr, an Ameri-

can merchant, who, as well as several other residents of the place, did everything in their power to further my object. The vicinity of Durango did not offer at this time of the year many specimens; and hence I concluded that it would be useless to penetrate at this season further northwards to Chihuahua, where the destructive effect produced by the winter upon the vegetation of the highlands would be still more manifest. Another reason which induced me to alter my original plan was the great risk every one incurs who now ventures upon a journey to Chihuahua. The tide of civilization, pressing hard from north and east, has driven the Indian tribes into the corner formed by the States of Chihuahua, Sonora, and Durango, made them strong and united, and dangerous to the white inhabitants of the country. The savages spare none; every one who falls into their hands dies, often a cruel death. So great is the terror they inspire, and so daring their courage, that eighty Indians on one occasion ventured into Durango, a city of 22,000 inhabitants, robbing and killing in every direction. I now took a south-western direction, the little-frequented road from Durango to Tepic. Departing from Durango on the 2nd of January, 1850, I reached on the 5th of the same month San Franzisco de Mesquital, a considerable village, the inhabitants of which, as the latter part of the name indicates, occupy themselves with the manufacture of *mesquital* from divers species of Agave. As far as Mesquital there are several large estates, but having passed that place one enters a desolate district; there are no houses, no people; the road becomes mountainous and very badly marked, as it is only trodden by a few Indians, the principal communication between Durango and Tepic being carried on by way of Guadalajara. I collected however a good many specimens, the vegetation not having suffered so much from drought and frost as in that part of the Sierra Madre which I crossed when coming from Mazatlan. On the 12th of January I reached the village of Santa Teresa, about two days' distance from Tepic, and inhabited by the Coras, a tribe of Indians whom the Jesuits converted to Christianity. There were three persons who understood Spanish; all the others could only converse in their own peculiar language. They seemed to be an honest and hospitable people. I remained five days with them, proceeded to within a day's distance of Tepic, and then returned to Durango, taking a different route, which conducted me to a place termed Guajolote, also inhabited by Indians. I left Durango on the 13th of February for Mazatlan, after despatching from thence, by way of Tampico, two cases with *Orchideæ*, *Cacteæ*, *Bromeliaceæ*, and other living plants, which however never reached their destination. The road was in a terrible state, for the wild Comanche Indians, having come near and killed several of the *rancheros*, most of the places were deserted, the people having fled. We, thank God, arrived safe in Mazatlan on the 22nd of February, 1850, where I was hospitably received by the house of Lomer, Melcher, and Co. H.M.S. Herald had, contrary to my expectation, not yet returned, and did not make her appearance until the 22nd of March; she had been surveying, in the Gulf of California, the coasts of Sinaloa and Sonora, a sterile and barren country. The vessel finally left Mazatlan on the 4th of April.

The following pages will contain the results of H.M.S. Herald's expedition to Mexico, as well as those obtained by H.M.SS. Blossom and Sulphur, added to which are descriptions, with remarks, of part of the collection formed by Mr. Potts in Chihuahua, particularly in the vicinity of the capital of that State. It is to be regretted that the expeditions of the 'Blossom' and 'Sulphur' were so unproductive in general remarks respecting the nature of the country and its vegetation, and that my own journeys were so limited, and took place in such an unfavourable season of the year; because the materials thus brought together are not sufficient to give such general descriptions of the Flora of North-western Mexico as have been furnished in the "Introduction" to my Flora of Western Eskimaux-land and of the Isthmus of Panama.

INTRODUCTION.

The district occupied by the Flora to which the following pages are some contributions, is not defined by any political or natural limits, but by an imaginary line extending from Acapulco north-eastwards to Durango, thence to Chihuahua, from that city to the mouth of the river Colorado, in the Gulf of California, and along the western coast of Mexico to Acapulco. Generally speaking, it may be said that a narrow strip of flat land runs along the whole coast, immediately followed by a chain of mountains, which on their eastern side join the table-land of Mexico, the plains of Anahuac. Such a district, situated partly within the boundary of the tropics, partly without it,—and, possessing lowlands, high mountains, and elevated plains, has a great diversity of climate,—is subject to great extremes of temperature. On the coast from Acapulco to Mazatlan there are the usual tropical seasons, the wet and the dry; the former commencing about the end of May, and ending towards the end of August, or sometimes a little later: from Mazatlan northwards to the river Colorado, a country situated immediately without the tropics, the equinoctial seasons are less distinctly marked, the climate partaking more of the character of that of the temperate zone, and being besides very dry. In the mountains every altitude has its own range of temperature and moisture; the western declivity however possessing generally a higher temperature and a greater degree of moisture than the eastern. On the higher summits the rivulets are frozen during the cold season, and snow often falls.*

The climate of the table-land of Durango and Chihuahua is, like that of the greatest portion of the elevated plains of Mexico, dry, differing in that respect essentially from that of the higher regions of the New Granadian, Ecuadorian, and Peruvian Andes, where moisture is abundant, and brooks, rivers, lagoons, and lakes promote a more luxuriant vegetation than is to be met with in Mexico at similar elevations. The extremes of heat and cold are unknown. Towards the end of February the night-frosts cease; spring commences, poplars and willows begin to get green, peaches and apricots put forth their blossoms, but the temperature alone, though fast increasing during April and May, is not sufficient to awaken

* The Author did not observe any perpetual snow in the tracts he traversed.

nature altogether. The fields remain dry until, towards the latter end of May or in the beginning of June, the vivifying rains set in; in a few days every herb, every shrub and tree has started into life, and the vegetation developes itself with great rapidity: the season answering to the North European spring has commenced. Early in September the rains cease; in October the night-frosts (which last until February) recommence, except which there are few indications of winter; snow seldom falls, and never remains long on the ground. The great aridity of the climate is best illustrated by the fact that, though the rainy season only terminates early in September, there is very little water to be met with in any part of the plains during the winter months (October until February). The periodical streams seem to disappear at the moment the rains themselves cease, and the perpetual springs, streams, and small rivers are so few in number that the traveller has very often to search for hours ere he is able to meet with water; fortunately the Mexican Flora mostly has furnished a guide to places where there is always a good supply, by planting on the banks of the running streams Sabino-trees (*Taxodium distichum*, Rich.) to inform the weary traveller, when he descries their high waving tops, that the object of his search is close at hand.

The immediate neighbourhood of the coast is generally lined with a dull maritime vegetation, the Mangrove-tree being very frequent, and appearing from Acapulco to a little to the north of Mazatlan (lat. 24° 38′ N.), where, together with the Cocoa-nut Palm, and many other forms common all along the western shores of America, from Guayaquil northwards, it reaches its extreme northern limit. Advancing a short distance inland, the aspect of the vegetation improves; trees of *Crescentia alata*, *Hæmatoxylon Campechianum*, *Cordia Gerascanthus*, *Ipomœa arborescens*, *Cratæva Tapia*, evergreen Figs, and feathery *Mimosæ*, shrubs of *Bixa Orellana*, *Malvaviscus arboreus*, different species of *Hibiscus*, *Triumfetta*, and *Poinsettia pulcherrima*, a great variety of creeping and winding plants, such as *Clematis dioica*, numerous *Convolvulaceæ*, and the splendid *Antigonon leptopus*, which, between Mazatlan and San Sebastian, covers almost every bush with its pink blossoms, are to be met with.

On ascending the mountains we meet, about 1500 feet above the sea-level, the first Evergreen Oaks, which soon increase in number of species as well as in that of individuals, and are, at the height of about 3000 feet, joined by various *Coniferæ* and a rich mountain vegetation. It is about at this height that the traveller realizes all the ideal notions he may have conceived of fine localities and beautiful vegetation. Santa Lucia, situated on the road from Mazatlan to Durango, may serve as an appropriate illustration. Situated about 4000 feet above the sea, enjoying throughout the year a temperate climate, it lies in a romantic valley, encircled by wooded mountains, which admit a view of the Pacific Ocean. The houses of the Indians, scattered over an undulated surface, are surrounded by a vegetation in which the graceful forms of the tropics are harmoniously blended with those of the temperate zone. *Mimosæ* stand in company with Oaks and Firs, hardy *Umbelliferæ* and *Compositæ* with *Cupheas*, *Lobelias*, and *Lophospermums*; nearly every hedge is overgrown by

a splendid *Ipomœa*, the azure blossoms of which are from four to five inches across, and set so close together that hardly a leaf is to be seen, and the whole plant resembles a blue sheet, whence it derives its vernacular name, "Manto de la Virgin" (Cloak of the Holy Virgin).

At a greater elevation the tropical forms disappear more and more before those usually termed European—*Amentaceæ*, *Coniferæ*, *Ericaceæ*, *Gentianeæ*, *Rosaceæ*, etc. Ferns, among them two familiar acquaintances from Europe, *Pteris aquilina* and *Osmunda regalis*, become more abundant, if not in species, at least in individuals, especially in the ravines (*barancas*), localities which, in these as in other parts of Mexico, are amongst the richest the botanist can explore. Near the Rancho of Guadalupe the Author found in one of them, among many other rare plants, a *Lonicera*, a *Hydrangea*, and *Chamæcyparis thurifera*, a noble tree, attaining the height of 100 to 150 feet, and always growing, like the *Taxodium distichum*, by running streams.

The table-land is in most parts very thinly wooded. For miles and miles you behold nothing save shrubby *Opuntias*, intermingled with *Visachas* (*Acacia Farnesiana*, Willd.), or groups of *Tascate* (*Juniperus tetragona*, Schlecht.); indeed the vicinity of Durango can only boast of about seven species of indigenous trees, namely, a Willow, the *Acacia* just named, a *Prosopis*, *Cratægus Mexicana*, *Taxodium distichum*, *Casimiroa edulis*, and a *Yucca*. These, together with a few shrubby *Acanthaceæ*, *Compositæ*, *Scrophularineæ*, and *Cacteæ*, and the everywhere prevailing *Agaves*, are the chief representatives of the Flora one meets with during the winter. Of *Cacteæ* the immediate neighbourhood offers three *Opuntias*, two *Echinocacti*, and a *Mamillaria*.

Several indigenous plants deserve special mention on account of their usefulness to the inhabitants. The round *Cacteæ*, vernacularly termed "Visnagas," are made into sweetmeats, sold in the city of Durango by the name of "Dulce de Visnagas." The flowers of several *Agaves* and of a species of *Yucca* are boiled, and in that state eaten. The *Verdolaga* (*Portulaca*), which grows in great quantity at this coast, is served up as a potherb at Mazatlan, where also the young branches of some *Opuntias* are eaten as salad. The *Fresa de la Sierra* (*Fragaria vesca*, Linn.), our Wood Strawberry, the *Zapote blanco* (*Casimiroa edulis*, Ll. et Lex.), the *Tejocote* (*Cratægus Mexicana*, De Cand.), yield edible fruit, and the *Pino Piñon* (*Pinus cembroides*, Zucc.) edible seeds. In the shops of Durango various other indigenous fruits are exposed for sale;—for instance, edible Acorns and Hickories, both of which have not yet been traced to their botanical sources. In the neighbourhood of San Sebastian Brazil-wood is cut for exportation, employing a great number of people; large quantities of it, especially that of the stem, which obtains about double the price the branches do, are daily carried for sale to Mazatlan.

The coast is but ill supplied with fruit and vegetable, though the climate offers every advantage, and the numerous vessels touching there every encouragement for their extensive cultivation. Oranges, Bananas, Tomatoes, Sweet Potatoes, Cabbage, Beans, Indian Corn,

Cucumbers, Melons, Chilis, etc., are the principal sorts to be procured, and that chiefly at Acapulco and San Blas; Mazatlan is, if possible, supplied still worse. In the settlements of the Sierra Madre, situated on the roads from Mazatlan to Durango, and from that of the latter place to Tepic, the vegetable food to be obtained consists chiefly of Indian Corn, Beans, and Chili, which however cannot be pointed out as a peculiarity of those districts, as the three last-named articles must be considered as the national food of Mexico generally. The Indian corn, reduced to a mash by boiling it in water and beating it between stones, is made into thin cakes, baked in earthen pans, and then termed *tortillas de maiz* or *gordas de maiz:* they are eaten with chili at every meal. The same remark applies to the beans, which, in the house of the rich as well as of the poor, are never wanting, whether at breakfast, dinner, or supper. These beans, termed by the Aztecs "Yetl," by the modern Mexicans "Frijoles," and by botanists *Phaseolus Hernandezii*, are brown, and of a peculiarly agreeable flavour, recommending them to the notice of the European cultivator.

The highlands of the State of Durango yield Wheat, Potatoes, Maize, and Cotton to some extent; indeed some years before the Author's visit a cotton-mill had been established near the city of Durango, solely supplied with native produce, as is the case in various other parts of Mexico; besides these a considerable number of so-called European vegetables and fruits are grown—it cannot be said cultivated,—for all the attention devoted to them consists almost solely in planting and irrigating them. Under such circumstances many refuse to yield any satisfactory returns, and hence their cultivation is discontinued, whilst again others produce surprising harvests. At the city of Durango the White and Red Cabbage, the Scotch Kale, Savoy, and most other sorts of cabbage, succeed extremely well, but none of them equal in excellence the Cauliflower, which often attains such a size that a single head, measuring one and a half to two feet in diameter, makes a donkey load. This gigantic Cauliflower is not distinct from the sort grown in Europe, but solely produced by a peculiar method of cultivation,—a method, it must be added, dictated by necessity. Being one of those northern vegetables that degenerate, or bear no seed, if not annually reintroduced from Europe, it is propagated in a different way to what it is in our gardens. After the heads have been gathered, the old stubs are allowed to throw out lateral shoots; these are employed for cuttings, and they have to grow two years, producing in the second year the enormously large heads. Turnips, Lettuces, Kohlrabi, Steckrüben, Cucumbers, and Melons, succeed well. Green Peas may be had throughout the year. Of Asparagus only the young branches and leaves are eaten; the stem, when just emerging from the soil, is rejected by the Mexicans, and only consumed by the German and other foreign residents; hence it has received, when in that state, the name of "Asparago de los Alamanes," or "Asparago de los Estranjeros." Apples, though yielding abundant harvests, are without the agreeable flavour they possess in northern countries. Pears are rather superior in the latter respect, and the same may be said of the Quince, a fruit very extensively used for the preparation of sweetmeats. Peaches succeed extremely well. Plums yield very good returns: the same

remark applies to Strawberries. Cherries and Chestnuts have not yet been introduced, though the climate would probably suit the latter. Raspberries had only found their way thither a few years previous to the Author's visit, and nothing decisive about their success had been ascertained at that time.

It cannot be expected that a people paying so little attention to the cultivation of the most useful plants, should devote a great deal of care upon purely ornamental ones. Though it cannot be denied that they have a certain taste for flowers, yet it is very much inferior to that displayed, for instance, by some of the Indians in the more southern parts of Mexico. The courtyards of the houses (built in the Moorish style) are planted with trees of Oranges, Chirimoyas, Cypress, and Pomegranates; the corridors are filled with Roses, Stocks, Geraniums, Agapathes, Chinese Chrysanthemums, and Balsams. Further the Mexicans of this part of the Republic have not yet advanced. Several foreigners, especially English and Germans, have gardens chiefly devoted to the cultivation of flowers, but also to European fruit and vegetables, and deserving of notice, as they have become the means by which many of the exotic flowers, shrubs, and trees, and foreign fruits and vegetables now to be met with, have been introduced,—the means also by which, at a future period, the aspect of the country will lose its exclusively native character.*

* Dr. L. Kegel, a German physician, at the time of my visit residing at Durango, deserves particular mention as having been instrumental in introducing both useful and ornamental plants into the State of Durango, thereby conferring the greatest benefit upon the land of his adoption.

SYNOPSIS.

RANUNCULACEÆ.

1. Clematis *dioica*, Linn. Amœn. vol. v. p. 398; Spec. Plant. 765.—*C. Acapulcensis*, Hook. et Arn. Bot. Beech. p. 411!—*C. Caripensis*, H.B.K., Nov. Gen. vol. v. p. 36!—*C. sericea*, H.B.K. l. c.! Acapulco (Lay and Collie! Sinclair!); between Mazatlan and San Sebastian.

2. Clematis *Drummondii*, Torr. et Gray, Flor. N. Amer. vol. i. p. 9.—*C. nervata*, Benth. Pl. Hartweg. 5! Chihuahua (Potts!).

I have taken considerable pains to discover some specific distinction between the American species of *Clematis*, with climbing fruticose stems, paniculate, generally dicœcious flowers, four sepals, and plumose carpels, but I have failed in doing so. The plants vary from an extreme glabrous to a very villous state; the leaves from simple to highly pinnatisect in one and the same individual. No characters are to be found in the stamens, nor in the fruit. It is in hopes of being yet able to hit upon some character which will not break down in being traced through a great number of specimens that I still hesitate to unite *C. dioica* with its present allies. The characters insisted upon by authors as good marks of specific distinctions between the various species alluded to are quite useless, and if I were to be guided by the same principles in making new species of *Clematis*, as many previous authors have done, I should have no difficulty in selecting a considerable number of so-called new ones from the Hookerian Herbarium.

3. Clematis *reticulata*, Walt. Car. p. 156.—*C. Pitcheri*, Torr. et Gray, Fl. N. Amer. vol. i. p. 10!—*C. filifera*, Benth. Pl. Hartweg. no. 1590!

Leaves always reticulated; flowers solitary, without bracts, nodding (like *C. Douglasii*, Hook.); sepals 4, on the outside either glabrous or more or less velvety; carpels inflated, either with adpressed hair or plumose.

Geographical distribution: Zinepan (Coulter, no. 642!), Leon (Hartweg, no. 1590!), Texas (Gregg, nos. 384 and 338! Drummond! Lindheimer! fasc. i. no. 5!).

I may remark here that I have identified *C. lasiantha*, Nutt., with *C. Peruviana*, De Cand. (*C. sericea?* var. *β*, Hook. et Arn. Bot. Misc.!), and a plant collected by Mathews in Peru, with *C. hexasepala*, De Cand. I am inclined to think that *C. pauciflora*, Nutt., is merely a synonym of the latter; at least there is nothing either in the description or specimens of Nuttall that disagrees with some specimens of *C. hexasepala*, De Cand.; but the flowers of Nuttall's *C. pauciflora* are unknown, and until that desideratum is supplied nothing positive can be decided.

DILLENIACEÆ.

4. Curatella *Americana*, Linn., De Cand. Prodr. vol. i. p. 70.—*C. Cambaiba*, St. Hil.? Acapulco (Lay and Collie!).

5. Tetracera *volubilis*, Linn., De Cand. Prodr. vol. i. p. 67. Acapulco (Lay and Collie!).

MENISPERMEÆ.

6. Cocculus *oblongifolius*, De Cand. Prodr. vol. i. p. 99. Acapulco (Sinclair!).

Geographical distribution: Tehuan, State of Puebla (Galeotti, no. 1536!), Sonora alta (Coulter, nos. 556 and 656!).

7. Cissampelos *Pareira*, Linn., De Cand. Prodr. vol. i. p. 100. Tepic (Barclay!).

Geographical distribution: Zinapan (Coulter, no. 659!), Jalapa (Galeotti, no. 4623!), Veracruz (Linden, no. 986!).

PAPAVERACEÆ.

8. Argemone *Mexicana*, Linn., De Cand. Prodr. vol. i. p. 120.—Nomen vernacul. "Chicalote." Common in the lower coast region.

CRUCIFERÆ.

9. Senebiera *Mexicana*, Hook. et Arn. Bot. Beech. p. 276.—*Lepidium Virginianum*, Linn., De Cand. Prodr. vol. i. p. 205. Tepic (Lay!).

CAPPARIDEÆ.

10. Cratæva *Tapia*, Linn. Herb. (non Sp. Pl.)—Vellz. Fl. Flum. vol. v. t. 3.—*C. acuminata*, De Cand. Prodr. vol. i. p. 243.—*Cleome arborea*, Schrad., De Cand. l. c. p. 242.—Hook. et Arn. Bot. Beech. p. 276! Acapulco (Lay and Collie!); Mazatlan.

CISTINEÆ.

11. Helianthemum *glomeratum*, Lag., Dun. in De Cand. Prodr. vol. i. p. 269.—*H. polifolium*, Hook. et Arn. Bot. Beech. p. 410, non Torr. et Gray. Sierra Madre, on the road from Durango to Santa Teresa; Tepic (Sinclair!).

12. Cochlospermum *hibiscoides*, H.B.K., Nov. Gen. et Sp. vol. vii. p. 223.—*C. serratifolium*, De Cand. Prodr. vol. i. p. 527, fide Benth. Tepic (Lay!).

FLACOURTIANEÆ, *Griseb.*

(*Bixineæ, Samydeæ, Lacistemeæ, Pangiaceæ.*)

13. Bixa *Orellana*, Linn., De Cand. Prodr. vol. i. p. 259.—Nomen vernacul. "Achiote." Common in the coast region, from Mazatlan southwards.

14. Prockia *obovata*, Presl, Wlprs. Rep. vol. i. p. 204.—*Flacourtia celastrina*, Hook. et Arn. Bot. Beech. p. 277! non H.B.K. Tepic and Talisco (Lay and Collie!).

15. Casearia *corymbosa,* H.B.K., De Cand. Prodr. vol. ii. p. 49. Acapulco (Lay and Collie!).

16. Samyda *serrulata,* Linn., De Cand. Prodr. vol. ii. p. 47. Acapulco (Barclay!)

VIOLACEÆ.

17. Viola *Hookeriana,* H.B.K., De Cand. Prodr. vol. i. p. 296. Sierra Madre.

POLYGALEÆ.

18. Polygala (§ Timutua) *incarnata,* Linn., De Cand. Prodr. vol. i. p. 327. In savanas.

Geographical distribution: Oaxaca (Linden, no. 74!), Jalapa (Galeotti, no. 7096!), New Orleans (T. Drummond, no. 30!), West Florida (N. A. Ware!), North Carolina (W. D.!), Texas (Lindheimer!), and N. Cæsaria (Nuttall!).

19. Polygala (§ Timutua) *bicolor,* H.B.K., De Cand. Prodr. vol. i. p. 327.—*P. alba,* Nutt. Gen. vol. ii. p. 87!—*P. aparinoides,* Hook. et Arn. Bot. Beech. p. 277!—*P. asperuloides,* H.B.K., Nov. Gen. vol. v. p. 403!—*P. Beirichii,* Torr. et Gray, Fl. N. Amer. vol. i. p. 130!—*P. Boykinii,* Nutt. in Journ. Acad. Phil. vol. vii. p. 86!—*P. distans,* St. Hil. Fl. Bras. vol. ii. p. 24. t. 84!—*P. molluginifolia,* St. Hil. l. c. p. 25! Sierra Madre (Seemann, no. 2153!); Talisco (Lay and Collie!).

This species is closely allied to *P. verticillata,* Linn. (*P. galioides,* Poir.! *P. ambigua,* Nutt.! *P. leptocaulis,* Torr. et Gray!), an annual plant, from which it chiefly differs in its perennial root. The leaves are either alternate, opposite, or verticillate; when, as is often the case, they are present on individual plants in all three positions; the lower are opposite, the middle ones verticillate, and the upper ones alternate. The colour of the flowers varies, being greenish-white, white, rose-colour, and dark purple. "The specific name *alba* is not appropriate, as the plant varies to deep purple and purplish leaves."—C. A. Geyer, Memorand. in Herb. Hook.

Geographical distribution: Michocan (Galeotti, no. 876!), Zacatecas (Hartweg, no. 30! Coulter, no. 725!), Talisco (Lay and Collie!), some other part of Mexico, not specified(Gregg, no. 371!), Rio Colorado (Gordon!), Texas (Lindheimer! Drummond, no. 26! Berlandier, no. 2437!), Upper Platte, with *Mamillaria simplex* and *Evolvulus argenteus* (C. A. Geyer, no. 276!), valleys in the mountains beyond the Limpia (C. Wright, no. 99!), Florida and Alabama (Rugel!), New Orleans (Drummond!), Darien (Seemann, no. 1049!), Rio Grande (Tweede!), Rio Grande do Sal, Brazil (Isabelle!), Columbia (Hartweg, no. 900!).

20. Polygala (§ Timutua) *paniculata,* Linn., De Cand. Prodr. vol. i. p. 329. Cerro de Pinal.

I found both the white and the purple-flowering variety.

Geographical distribution: In Mexico, Jalapa (Coulter, no. 724!), Mirador (Linden, no. 172!), Real del Monte to Zacatecas (Coulter, no. 727!); out of Mexico: Guatemala (Skinner!), Texas (Berlandier, no. 2138!), Columbia (Hartweg, no. 898!), Loja, Ecuador (Seemann, no. 838!).

21. Polygala (§ Timutua) *scoparia,* H.B.K., De Cand. Prodr. vol. i. p. 329.—*P. spinescens,* Gillies in Hook. Bot. Misc. vol. iii. p. 146! New Mexico (H. B.).

Geographical distribution: Near El Parso, New Mexico (C. Wright, no. 100!), Chile (Gillies!).

22. Polygala (§ Senega) *floribunda,* Benth. Plant. Hartw. p. 58.—*P. ligustroides,* Aug. St. Hil. Fl. Bras. Mer. vol. ii. p. 49!—*P. oleæfolia,* A. St. Hil. l. c.! Zonaguia (Hartweg!).

On comparing the specimens of Hartweg, no. 447, and described by Bentham as *P. floribunda,* it will

be seen that they form, especially as regards their leaves, a transition between those found in Herbaria under the names of *P. ligustroides*, St. Hil., and *P. oleæfolia*, St. Hil., all three being slight varieties of one well-defined species, remarkable for its thick, almost coriaceous, and reticulated foliage.

Geographical distribution: Zonaguia, Mex. (Hartweg, no. 447!), Sierra de San Pedro Nolasco, Talea, etc., Mex. (Jurgensen, nos. 412, 541, and 453!), Pueblo Nuevo, Chiapas (Linden, no. 172!), Guatemala (Hartweg, no. 572! Skinner!), Minas Geraes (Claussen! Gardner, no. 4425!), Villa do Principe (Gardner, no. 4424!), some other part of Brazil, not specified in Herb. Hook. (Langsdorf!).

23. Polygala (§ Senega) *Americana*, Mill. Dict. n. 7.—*P. riviniæfolia*, H.B.K., Nov. Gen. vol. v. p. 408!—*P. Caracasana*, H.B.K. l. c. p. 407!—*P. ovalifolia*, De Cand. Prodr. vol. i. p. 331!—*P. obscura*, Benth. Pl. Hartw. p. 58!—*P. platycarpa*, Benth. l. c. p. 113!—*P. hebantha*, Benth. Bot. Sulph. p. 67!—*P. ovatifolia*, A. Gray, Pl. Wright. p. 39!—*P. puberula*, A. Gray, l. c. p. 40!—*P. grandiflora*, Walt. Car. p. 179!—*P. pubescens*, Mühl. Cat. p. 66!—*P. Senega*, var. *rosea*, Michx. Fl. vol. ii. p. 53!—*P. Senega*, A. St. Hil. et Moq. Tand. in Mem. Mus. vol. xvii. t. 27 et 28. f. 10! non Linn. Chihuahua (Potts!), Acapulco (Sinclair!).

A plant extremely variable in the size and form of its foliage; in the humid, hot coast-region the leaves are broad ovate or elliptical, but in the dry, cool districts of the Mexican table-land, etc. (Oaxaca, Chihuahua, for instance), very narrow, often linear. *P. Americana* is a half-shrubby plant, always more or less clothed with down, alternate, mucronate leaves, racemose bluish flowers, and emarginate capsules.

Geographical distribution: Mexico (Galeotti, no. 883! Hartweg, no. 446! Coulter, no. 732! Bates! Linden, no. 174! W. Harris!), Guatemala (Skinner! Hartweg, no. 632!), Gulf of Fonseca (Sinclair!), Volcano of Chiriqui, Veraguas (Seemann, no. 1645!), Cerrito de Guayaquil, Ecuador (Jameson!), Island of Trinidad (Lockhart!), New Mexico (C. Wright, no. 103!).

24. Monnina (§ Hebeandra) *Xalapensis*, Kunth, De Cand. l. c. p. 339. Sierra Madre.

CARYOPHYLLEÆ.

25. Mollugo *arenaria*, H.B.K., De Cand. Prodr. vol. i. p. 392. Tepic (Lay!).

26. Drymaria *cordata*, Willd., De Cand. Prodr. vol. i. p. 395. Talisco (Lay and Collie!).

27. Stellaria *nemorum*, Linn., De Cand. Prodr. vol. i. p. 396. Sierra Madre.

I cannot find any difference whatsoever between the specimens collected by me in the temperate parts of the Sierra Madre and the common European type of *S. nemorum*, Linn. That the seed of it may have been imported is a thought which would strike every one on first hearing of this plant as growing in Mexico, but the place where I found it does not at all favour such an hypothesis, and I am therefore inclined to look upon it as indigenous. I may also remark that Bridges found it at Valparaiso, Chile; it is his no. 121.

PORTULACEÆ.

28. Portulaca *pilosa*, Smith? Hook. et Arn. Bot. Beech. p. 293. Tepic (Lay!)

29. Portulaca sp. (*oleracea*, Linn.?)—Nomen vernacul. "Verdolaga." Common about Mazatlan, where it is used as a potherb.

MALVACEÆ.

30. Malva *spicata*, Linn., De Cand. Prodr. vol. i. p. 430. Tepic (Lay!)

31. Pavonia *Mexicana*, Humb. et Kunth, Nov. Gen. vol. v. p. 284. Acapulco (Sinclair !).

32. Pavonia *racemifera*, Hook. et Arn. Bot. Beech. p. 277. Tepic (Lay !).

33. Hibiscus *Tampicensis*, Moric., Wlprs. Rep. vol. i. p. 305. Tepic (Lay !).

34. Malvaviscus *arboreus*, Cav., De Cand. Prodr. vol. i. p. 445.—*M. Acapulcensis*, Hook. et Arn. (et Humb. et Kunth ?). Mazatlan, common.

35. Paritium *Azanza*, G. Don, Gen. Syst. Gard. vol. i. p. 485.—*Hibiscus Azanzæ*, De Cand. Prodr. vol. i. p. 454. Tepic (Lay !).

36. Gossypium *Barbadense*, Linn. ? Tepic, cultivated (Lay !).

37. Anoda *cristata*, Schlecht., Linnæa, vol. xi. p. 210.—*A. triloba*, Cav. !—*A. Dilleniana*, Cav. ! Talisco (Lay and Collie !).

38. Anoda *hastata*, Cav., De Cand. Prodr. vol. i. p. 458. Tepic, San Blas, and Acapulco (Sinclair ! Hinds ! Barclay !).

39. Anoda *lanceolata*, Hook. et Arn. Bot. Beech. p. 411. Tepic (Lay !).

40. Sida *carpinifolia*, Linn. fil., De Cand. Prodr. vol. i. p. 461. Common along the coast.

41. Sida *rhombifolia*, Linn., De Cand. Prodr. vol. i. p. 462.—*S. rhomboidea*, Roxb. Common along the coast.

42. Sida *filiformis*, Moric., Wlprs. Rep. vol. i. p. 321.—*S. filicaulis*, Torr. et Gray, Fl. N. Amer. vol. i. p. 232 ! Chihuahua (Potts !), Texas (Velasco ! Lindheimer, no. 255 !), New Mexico (C. Wright, no. 892 !).

43. Sida *dumosa*, Swartz, De Cand. Prodr. vol. i. p. 465.—*S. pyramidata*, Cav., De Cand. l. c. ! —*S. glandulifera*, Benth. Bot. Sulph. p. 69 ! Sierra Madre, in the vicinity of the village of Santa Lucia ; Realejo (Sinclair !).

44. Sida *paniculata*, Linn., De Cand. Prodr. vol. i. p. 465. Tepic (Lay !).

45. Malachra *bracteata*, Cav., De Cand. Prodr. vol. i. p. 441. Tepic (Lay !).

46. Abutilon *albidum*, Hook. et Arn. Bot. Beech. p. 278. Tepic (Lay !).

47. Bastardia *crispa*, St. Hil., Hook. et Arn. Bot. Beech. p. 412. Acapulco (Sinclair !).

48. Bastardia *viscosa*, Humb. et Kunth, Nov. Gen. et Sp. vol. v. p. 256. Acapulco (Sinclair !).

STERCULIACEÆ.

49. Helicteris *altheæfolia*, Lam. Dict. vol. iii. p. 88. Acapulco (Sinclair !), Tepic (Lay !).

50. Eriodendron *anfractuosum*, var. *Caribæum*, De Cand. Prodr. vol. i. p. 479 ? Acapulco (Hinds !).

51. Bombax *ellipticum*, H.B.K., De Cand. Prodr. vol. i. p. 479. Tepic (Lay !).

BUETTNERIACEÆ.

52. Guazuma *ulmifolia,* Lam. Dict. vol. iii. p. 52.—De Cand. Prodr. vol. i. p. 485. Tepic (Lay !).

53. Guazuma *polybotrya,* Cav., De Cand. Prodr. vol. i. p. 485. Acapulco and Tepic (Lay and Collie !).

54. Buettneria *lanceolata,* De Cand. Prodr. vol. i. p. 487. Tepic (Lay !).

55. Melochia *tomentosa,* Linn., De Cand. Prodr. vol. i. p. 490. Acapulco (Hinds ! Barclay !).

56. Melochia *parvifolia,* H.B.K., De Cand. Prodr. vol. i. p. 490. Tepic (Lay !).

57. Riedleia *nodiflora,* Sw., De Cand. vol. i. p. 491. Acapulco (Lay and Collie !).

58. Riedleia *serrata,* Vent., De Cand. Prodr. vol. i. p. 492. Tepic (Lay !), Acapulco (Sinclair !).

TILIACEÆ.

59. Corchorus (§ Coreta) *siliquosus,* Linn., De Cand. Prodr. vol. i. p. 504. Talisco (Lay and Collie !).

60. Triumfetta *grandiflora,* Vahl, De Cand. Prodr. vol. i. p. 508.—*T. polyandra,* Flor. Mex. ic. ined. ! Sierra Madre, near the village of Santa Lucia.

Geographical distribution: Dominica (Imray !), Peru (Mathews, no. 2080 !), Mexico (Hartweg, no. 448 ! Jurgensen, nos. 960 and 282 ! or 882 ?). The leaves of Hartweg's specimens are covered with short tomentum; those of Imray and Jurgensen but sparingly furnished with hair, and those of mine almost glabrous. The fruit also is either glabrous or hairy in various degrees.

61. Triumfetta *paniculata,* Hook. et Arn. Bot. Beech. p. 279. Talisco (Lay and Collie !).

62. Triumfetta *dumetorum,* Hook. et Arn. l. c., non Schlecht. Talisco (Lay and Collie !).

The specimens upon which the latter two species were founded are very imperfect; those of *T. paniculata* being in fruit, and almost without leaves, those of *T. dumetorum* in flower only. To me they look as if they belonged to one and the same species.

TERNSTRŒMIACEÆ.

63. Ternstrœmia *Topegapote,* Cham. et Schlecht., Wlprs. Rep. vol. i. p. 369. Sierra Madre, on the road leading from Mazatlan to Durango.

64. Gordonia *Lasianthus,* Linn., var.? foliis integerrimis, Hook. et Arn. Bot. Beech., p. 280. Tepic (Lay !).

AURANTIACEÆ.

Casimiroa, La Llav. et Lexarz.—*Charact. Gen. emend.* *Flores* hermaphroditi vel rarissime unisexuales. *Calyx* 5-fidus. *Corollæ* petala 5, hypogyna, libera. *Stamina* 5; filamenta libera, subulata, basi latiore complanata; antheræ cordato-oblongæ, biloculares, longitudinaliter dehiscentes. *Ovarium* toro brevissime impositum, ovatum, glabrum, 5-loculare. *Ovula* in loculis solitaria, angulo centrali inserta. *Stigma* sessile, 5-lobum. *Bacca* subglobosa, 5-loculare, pulpa sapidissima referta.

Semina in loculis solitaria. *Embryonis* exalbuminosi cotyledones amygdalinæ.—Arbor *Mexicana, mediocris, ramosa, inermis;* foliis *alternis, 5–7-foliolatis;* foliolis *ovatis v. obovato-oblongis integerrimis vel leviter dentatis, subtus* petiolis petiolulisque *exalatis puberulis;* floribus *axillaribus vel terminalibus, breviter racemosis;* corollis *viridibus;* baccis *mali majoris molle.*—*Casimiroa*, La Llav. et Lex. Nov. Veg. Descr. vol. ii. p. 2.—Endl. Gen. Pl. no. 6879.

Casimiroa is one of the genera that have hitherto been without a fixed station in the Natural System, and Endlicher placed it at the end of his great work among his "Genera dubiæ sedis." There can be no doubt however that it belongs to *Aurantiaceæ*, the fruit, the leaves, and many other parts of the plant having that abundance of oily receptacles so characteristic of that Order. There is however one feature which does not occur among any of the members of this Order hitherto collected there, viz. the number of the stamens being restricted to five, equal to that of the petals (and alternating with them), while in all other Genera it is at least double, but I do not think that on this account *Casimiroa* ought to be excluded from *Aurantiaceæ;* on the contrary, its flowers ought to be looked upon as the normal type of the Order, the quinary arrangement of the Exogens being represented in its greatest purity. *Casimiroa* is also interesting in a geographical point of view, as the only *Aurantiacea* indigenous to America; the Oranges found apparently wild in parts of Brazil have, it would seem, been introduced. There is as yet only one species of the Genus, viz.:—

65. Casimiroa *edulis*, La Llav. et Lexarz. l. c.—Nomen vernacul. "Zapote blanco." Frequent in the States of Sinaloa and Durango, both wild and cultivated.

This tree has a remarkable tendency to accommodate itself to different climates. It grows from the lowest coast-region to an elevation of 7000 feet, producing everywhere an abundant harvest. It was well known to the ancient Aztecs, who termed it "Iztactzapotl," and also "Cochitzapotl," the former name being composed of the words *iztac* (white) and *tzapotl* (sapota). "Tzapotl," whence the Spanish corruption "Zapote" and the English "Sapota," signifies a succulent fruit containing large hard seeds, as for instance that of *Lucuma*, *Anona*, *Achras*, etc., a vague term for which scientific language has no equivalent expression. The second name, "Cochitzapotl," is derived from *cochi* (to make sleepy) and *tzapotl* (sapota), as the fruit, when eaten, is said to produce a somniferous effect. Hernandez, in his 'Historia Plantarum,' etc., lib. ii. cap. 142 (edition of Madrid, 1790), gives the following account of the tree and its properties. He says, "Arbor magna est atque incondita, foliis Mali medicæ, raris ac ternis, stipitibus albis nævis distinctis, floribus pallentibus et modicis, fructu vero Cotonei forma et magnitudine, vocato a nosotris Hispanis 'Zapote blanco,' eduli, saporis grati, sed non admodum salubris nutrimenti, et ossis nucleo læthali ac deleterio. Cortex arboris siccus est, ac paululum dulcis non sine quadam amaritudine; folia tusa et opposita, nutricum papillis infantulorum medentur diarrhœis; ossa usta et in farinam redacta opitulantur ulceribus putridis vitiata carne prorsus exesa atque absumta, purgato ulcere, carne generata, ac cicatrice mera quadam celeritate inducta; poma ingesta somnum conciliant, a quo invenere nomen. Nascitur in calidis frigidisque regionibus."

Plate LI. Branch of *Casimiroa edulis*, natural size.

Plate LII. Fig. 1, a flower-bud; 2, a flower, *expanded;* 3, a stamen; 4, ovary and calyx; 5 and 6, sections of ovary; 7, ovule; 8, an entire fruit; 9 and 10, sections of fruit; 11 and 12, entire seeds; 13 and 14, sections of seed; 15 and 16, cotyledons:—*all*, with the exception of 8, 9, and 10, *magnified*.

MALPIGHIACEÆ.

66. Byrsonima *cotinifolia*, H.B.K., Wlprs. Rep. vol. i. p. 169.—Nomen vernacul. "Nanchi." Cerro de Pinal; Tepic and Acapulco (Lay and Collie!).

67. Galphimia *glauca*, Cav., Wlprs. Rep. vol. v. p. 184.—*G. glauca* et *G. glandulosa*, Hook. et Arn. Bot. Beech. p. 280! Village of Santa Lucia; Tepic (Lay and Collie!).

68. Echinopteris *Lappula*, Adr. Juss., Wlprs. Rep. vol. v. p. 194. Sierra Madre.

69. Heteropteris *Beecheyana*, Adr. Juss., Wlprs. Rep. vol. v. p. 279.—*H. tomentosa*, Hook. et Arn. Bot. Beech. p. 281, excl. syn. Acapulco (Lay and Collie!).

70. Tetrapteris *Mexicana*, Hook. et Arn. Bot. Beech. p. 281. Talisco (Lay and Collie!).

71. Tetrapteris *Acapulcensis*, H.B.K., Wlprs. Rep. vol. v. p. 302. Acapulco (Lay and Collie!).

72. Gaudichaudia *Schiedeana*, Adr. Juss., Wlprs. Rep. vol. v. p. 346.—*Triopteris sericea*, Schlecht., Linn. vol. x. p. 243. Road from Durango to Tepic; Tepic (Lay!); Acapulco (Hinds! Barclay!).

73. Gaudichaudia *Arnottiana*, Adr. Juss., Wlprs. Rep. vol. v. p. 346.—*Hiræa cycloptera*, Hook. et Arn. Bot. Beech. p. 280. t. 58! Talisco and Tepic (Lay and Collie!).

74. Gaudichaudia *Filipendula*, Adr. Juss., Wlprs. Rep. vol. v. p. 347. San Blas to Tepic (Coulter, no. 859, or perhaps [the number is written almost illegibly] 854).

HIPPOCRATEACEÆ.

75. Hippocratea *Acapulcensis*, H.B.K., De Cand. Prodr. vol. i. p. 568. Acapulco (Lay and Collie!).

SAPINDACEÆ.

76. Cardiospermum *hispidum*, H.B.K., De Cand.? Prodr. vol. i. p. 602. Acapulco (Lay and Collie!).

77. Serjania *Mexicana*, Hook. et Arn. Bot. Beech. p. 281! et Willd.? Tepic and Acapulco (Lay and Collie!).

78. Serjania *paniculata*, H.B.K., De Cand. l. c.—Benth. Bot. Sulph. p. 76. Acapulco (Lay and Collie!).

79. Paullinia *Curassavica*, Linn., De Cand. Prodr. vol. i. p. 605. Tepic (Sinclair!).

80. Paullinia *fuscescens*, H.B.K.—Nov. Gen. vol. v. p. 120.—Hook. et Arn. Bot. Beech. p. 282. Acapulco (Lay and Collie!).

81. Sapindus *glabrescens*, Hook. et Arn. Bot. Beech. p. 281. Tepic (Lay!).

82. Dodonæa *viscosa*, Linn., De Cand. Prodr. vol. i. p. 616. Sierra Madre, common.

GERANIACEÆ.

83. Geranium *Caroliniarum*, Linn., De Cand. Prodr. vol. i. p. 643. Colder parts of the Sierra Madre.

Closely allied to *Geranium Hernandezii*, De Cand., which is *stated to be* a perennial, but *seems to be* an annual, like *G. Carolinianum*.

LINEÆ.

84. Linum *cruciatum*, Planch., Wlprs. Ann. vol. ii. p. 130.—*L. Schiedeanum*, Hook. et Arn. Bot. Beech. p. 411, non Cham. et Schlecht. In woods near Santa Lucia; Tepic (Sinclair !).

A perennial herb; petals yellow.

OXALIDEÆ.

85. Oxalis *Neæi*, De Cand. Prodr. vol. i. p. 689. Acapulco (Lay and Collie !).

ZYGOPHYLLEÆ.

86. Kallstrœmia *maxima*, Hook. et Arn. Bot. Beech. p. 282.—*Tribulus maximus*, Linn., De Cand. Prodr. vol. i. p. 704. Acapulco (Lay and Collie !), Chihuahua (Potts !).

CONNARACEÆ.

87. Rourea *glabra*, H.B.K. Nov. Gen. vol. vii. p. 41 ? Acapulco (Lay and Collie !).

88. Rourea ? *oblongifolia*, Hook. et Arn. Bot. Beech. p. 283. Tepic (Lay !).

ZANTHOXYLEÆ.

89. Zanthoxylum *Pterota*, H.B.K. ? Hook. et Arn. Bot. Beech. p. 282. Tepic (Lay !).

90. Brunella ? *quadrilocularis*, Hook. et Arn. Bot. Beech. p. 282. Tepic (Lay !).

CELASTRINEÆ.

91. Myginda *Scoparia*, Schlecht., Hook. et Arn. Bot. Beech. p. 283. Acapulco (Lay and Collie !).

92. Dulongia *acuminata*, H.B.K., Nov. Gen. et Sp. vol. vii. p. 76. t. 623. Sierra Madre.

Schlim's nos. 716 and 1155, from Soto and Ocaña, which agree with specimens collected by Mr. Jervise in Antioquia, differ from the Mexican *D. acuminata* in having larger and less serrated, sometimes almost entire leaves; they seem to represent a different species. *D. acuminata* was found in Mexico by Jurgensen (327 !) and Galeotti (Oaxaca, 7197 !).

RHAMNEÆ.

93. Zizyphus *acuminata*, Benth. Bot. Sulph. p. 78. Acapulco (Barclay !).

94. Rhamnus *tomentellus*, Benth. Pl. Hartw. p. 303.—*Frangula Californica*, A. Gray, var. *tomentella*, Gray, Pl. Wright. part ii. p. 28. Sierra Madre.

My specimens are very tomentose.

95. Karwinskia *Humboldtiana*, Gasc. Nov. Stirp. Fasc. vol. i. p. 351.—*Rhamnus Humboldtianus*, Röm. et Schult., H.B.K., Nov. Gen. et Sp. Pl. vol. vii. p. 400. t. 618.—*R. biniflorus*, var. ? Hook. et Arn. Bot. Beech. p. 283 ! Talisco (Lay and Collie !).

96. Ceanothus *azureus*, Desf., De Cand. Prodr. vol. ii. p. 31. Sierra Madre.

A common shrub in the mountainous districts of Mexico, varying considerably in the size of its leaves, and the density and colour of their tomentum. It has been found at Tolucan (Andrieux, no. 471!), where it is vernacularly termed "Palocolorado," Real del Monte (Coulter, no. 14!), Zinapan (Coulter, no. 15!), Tepic (Lay!), Oaxaca (Galeotti, nos. 1030 and 1031!), city of Mexico (Parkinson!), between Oaxaca and La Sierra (Hartweg, no. 451!), Southern Mexico (Linden, no. 204!).

97. Ceanothus *buxifolius*, Willd., De Cand. Prod. vol. ii. p. 32. Sierra Madre, in forests; Veracruz (Herb. Hook.).

EUPHORBIACEÆ.

(*Auctore F. Klotzsch.*)

Tribus I. Euphorbieæ, *Bartling*.

Euphorbia, *Linn., Gen. Plant. n.* 69.

Sectio 1. (*vide supra*, p. 99.)

98. Euphorbia *dioica*, Humb. Bonpl. et Kth. Nov. Gen. vol. ii. p. 43. Chihuahua (Potts!).

99. Euphorbia *parviflora*, Linn. Sp. 3514. Chihuahua (Potts!).

100. Euphorbia *hypericifolia*, Linn., var. *maculata*, Klotzsch; foliis macula atro-purpurea instructis. Chihuahua (Potts!).

101. Euphorbia *glaberrima*, Klotzsch (sp. nov.); fruticulosa, decumbens, ramosissima, glabra; ramulis teretibus articulatis dense foliosis; foliis oppositis minutis carnosis oblique ellipticis integerrimis, utrinque leviter emarginatis v. obtusis v. brevissime acutis, læte viridibus aut sanguinolentis; stipulis intrapetiolaribus ovatis subpersistentibus carnosis minimis, apice paucidentatis rubicundis; involucris in apice ramulorum axillaribus terminalibusque brevipedicellatis campanulatis quadriglandulosis; glandulis processibus membranaceis orbiculatis purpureis roseis aut candidis suffultis; stigmatibus tribus bipartitis recurvis; capsulis depresso-triangularibus, glabris. Sierra Madre.

A decumbent shrub, six inches to one foot long. Leaves distinctly petiolated, varying greatly in size, form, and colour; they are from 2–4 lines long, and from 1–2 lines broad.

Sectio VI. Exstipulatæ, *Rœper, Enumeratio Euphorbiac.*, p. 59.

102. Euphorbia *Seemanni*, Klotzsch (sp. nov.); suffruticosa, glabra; caule tereti erecto versus apicem ramoso; foliis glaucescentibus integerrimis acutis, caulinis alternis oblongo-linearibus; verticillo quinqueradiatio, foliolis lanceolatis sessilibus brevioribus; foliis floralibus oppositis, ternis aut quaternis, brevissimis ellipticis acutissimis; involucris turbinatis glabris quadriglandulosis, glandulis inæqualibus 2–3-dentatis, majore 5-dentata; stigmatibus erectis leviter bifidis; germine glabro; capsulis . . . . . Sierra Madre.

Allied in habit to *Euphorbia campestris*, Cham. et Schlecht., but easily distinguished from that species by its larger leaves, the form of the glands, and the erect, slightly divided stigmas. *E. Seemanni* is an erect, suffruticose plant, with leaves from 2–2½ inches long, and 2–5 lines broad.

Sectio VII. Frutices scoparii ramosi erecti articulati; foliis deciduis exstipulatis oppositis ternis aut quaternis; floribus axillaribus cymosis, involucris margine 5-fidis, lobis membranaceis coloratis, basi calloso-patellatis.

103. Euphorbia *recta*, Klotzsch (sp. nov.); fruticosa, scoparia, ramosa; ramis strictis sulcato-striatis glabris articulatis; internodiis sesqui- ad tripollicaribus; foliis caulinis ternatim verticillatis caducis adscendentibus, cicatricibus latis angustatis scutellato-subsemilunatis, margine tumescenti-callosis integerrimis; cymis axillaribus abbreviatis multifloris bracteatis; bracteis ternatim verticillatis deciduis lineari-subulatis; involucris campanulatis puberulis 5-fidis, lobis orbiculato-ovatis candidis, basi lutescenti-callosis, æstivatione imbricatis; floribus masculis numerosis, antheris didymis globosis; germinibus triangularibus glabris, stylis usque ad basim partitis, stigmatibus bifidis, lobis teretibus obtusis. Sierra Madre, on the road from Durango to Tepic.

A shrub from 5 to 7 feet high, of which I have only a flowering branch, which is about 15 inches long, simple, straight, and about as thick as a goose-quill. The upper internodia are 1½ to 2, the lower about 3 inches long. There are no leaves on the specimen, nor on the sheet of paper in which it is contained; they must have dropped off when it was collected, perhaps even earlier. [There were no leaves on this shrub when I gathered the specimens; their flowers seem to come out after the leaves have dropped off.—*Berthold Seemann.*]

Sectio VIII. Frutices scoparii ramosi exarticulati inermes sparsim-foliosi; floribus glomerato-aggregatis axillaribus, involucris margine 5-fidis, lobis membranaceis coloratis, basi calloso-patellatis.

104. Euphorbia *occulta*, Klotzsch (sp. nov.); fruticosa, ramosa; ramis teretibus strictis albicantibus glabris lævibus inarticulatis; foliis alternis deciduis linearibus acutis recurvis rigidis, supra sulcatis, subtus nervo prominente instructis; glomerulis axillaribus, involucro campanulato fuscescente-viridi puberulo, margine 5-lobo, lobis cordato-rotundatis albicantibus membranaceis recurvis, basi concoloribus calloso-patellatis, æstivatione imbricatis; floribus masculis numerosis, antheris didymis globosis; germinibus solitariis glabris stipitatis nutantibus triangularibus; stylis tribus patentibus usque ad basim partitis; stigmatibus integris incrassatis. Sierra Madre.

A shrub from 1 to 3 feet high; leaves eight lines long, and half a line broad.

Poinsettia, Graham in Edinb. New Phil. Journ. March, 1836.—Bot. Mag. t. 3493.

105. Poinsettia *pulcherrima*, Grah. l. c.—*Euphorbia pulcherrima*, Willd. Herb. n. 9259. Nomen vernacul. "Catalina" et "Noche buena." Common in damp shady localities on the western declivity of the Sierra Madre to an elevation of about 4000 feet; cultivated extensively for ornamental purposes in the gardens of Durango.

"An extract from its bracts, mixed with lime-juice, gives an excellent scarlet dye. In the city of Durango the plant is cultivated in almost every garden, under the name of 'Noche buena,' because it flowers about Christmas ('Noche buena' of the Spaniards). I have been told there existed in some part of Mexico a variety of this species with white instead of scarlet bracts, but I have never seen it."—*Berthold Seemann.*

106. Poinsettia *pedunculata*, Klotzsch (sp. nov.); fruticosa, ramosa, pubescenti-hispida; ramulis teretibus erectis pedunculisque hirsutis; foliis difformibus alternis margine cartilagineis, subtus pallide-viridibus hirtis, supra e viridi-purpurascentibus margineque hispidis, aliis panduræformibus, aliis lanceolatis, apice alternantibus; inflorescentia terminali longi-pedunculata in capitulum congesta quadribracteata, bracteis sanguineo-puniceis ovatis, margine remote-serratis, subtus sparsim hirtis albicanti-

bus; involucris turbinatis glabris uniappendiculatis, margine inciso-laciniatis. In a baranca near the village of Santa Teresa, on the road from Durango to Tepic.

A shrub 2 to 3 feet high, forkedly branched. Leaves either panduræform, 2 inches long and 1 inch broad, or lancet, and $2\frac{1}{2}$ inches long and half an inch broad; bracts 8 lines long, and 3 to $3\frac{1}{2}$ lines broad. The involucra, their edge and form, as well as their male and female flowers, are like those of *P. pulcherrima*.

Tribus III. Acalypheæ, *Bartling*.

107. Acalypha *microphylla*, Klotzsch (sp. nov.); suffruticosa, tenuis, erecta, ramosa, pubescens; caule ramisque gracilibus evanescente pubescentibus; foliis parvis ovato-subrhombeis obtusis, antice serrato-dentatis longipetiolatis; spicis pedunculatis interruptis solitariis, masculis axillaribus filiformibus, fœmineis abbreviatis terminalibus. About Mazatlan, in waste places.

A suffruticose plant, about a foot high. Blade of the leaves 4 to 6 inches long, and 3 to 4 lines broad, with transparent dots.

Tribus IV. Crotoneæ, *Blume*.

Lasiogyne, Klotzsch, Plant. Meyen. in Nov. Act. Acad. Cæs. Leop.-Carol. Nat. Cur. vol. xvi. Suppl. ii. p. 418.

108. Lasiogyne *Pottsii*, Klotzsch (sp. nov.); fruticosa, humilis, erecta, gracilis, vix ramosa, adpresse stellato-tomentosa; caule ramisque tereti-subcompressiusculis, deinde versus basim nudiusculis, petiolis erectis semipollicaribus, foliis minoribus oblongis brevissime apiculatis, basi obtusis, supra pallide viridibus, subtus incanis; floribus monoicis in apice ramorum brevi-racemosis, bracteis subulatis deciduis, extus hirtis; calycis laciniis ovatis brevi-acutis incano-tomentosis; petalis florum masculorum anguste oblongis unguiculatis margine villosis; staminibus exsertis; capsulis evanescenti-hirsutis. Chihuahua (Potts!).

Blade of the leaves 1 inch long, and generally 3 to 5, seldom 6, lines broad. The species was named in honour of its discoverer, J. Potts, Esq.

LEGUMINOSÆ.

Subordo I. Papilionaceæ.

109. Lupinus (§ Sericei) *Madrensis*, Seem. (Tab. LIII.), sp. nov.; perennis, sericeus; caule herbaceo; foliolis 7–10 lineari-oblongis vel subobovato-oblongis, supra pubescentibus viridibus, subtus sericeis, petiolo 3–4-plo brevioribus, stipulis subulatis; floribus in racemo conico irregulariter verticillatis; bracteis ovatis longe acuminato-subulatis corolla duplo longioribus caducis, cum calyce bracteolato argenteis, labio calycis superiori saccato; corolla glabra (cærulea); ovario legumineque hirsutis. Sierra Madre (no. 2185), in woods.

Stem from $1\frac{1}{2}$ to 2 feet high. Petioles often 6 inches long; leaflets from 1 to $1\frac{1}{2}$ inch long. Legumen about an inch long, 5–6-seeded.—This species is allied to *L. argenteus*, Agdh., and *L. ornatus*, from which it chiefly differs by its remarkably broad bracts and the saccate upper lip of the calyx, two characters not well represented in our Plate.

Plate LIII. Fig. 1, an entire leaf of a young plant; 2, an entire flower; 3, vexillum; 4, carina; 5, one of the alæ; and 6, ovary:—*all*, with the exception of Fig. 1, *magnified*.

110. Crotalaria *Hookeriana*, Alph. De Cand. 8. Not. Plant. Rar. Gen. p. 23.—Benth. Bot. Sulph. p. 79.—*C. ovalis*, Hook. et Arn. non Pursh! Tepic (Barclay! Lay and Collie!).

111. Crotalaria *Purshii*, De Cand. Prodr. vol. ii. p. 124. Sierra Madre.

112. Crotalaria *sagittalis*, Linn., De Cand. Prodr. vol. ii. p. 124. Tepic (Lay).

113. Crotalaria *bupleurifolia*, Cham. et Schlecht., Wlprs. Rep. vol. i. p. 592, et vol. v. p. 438. Cerro de Pinal.

Also found at Jalapa (Galeotti!), and Cuesta Grande de Chiconguiaco (Schiede!).

114. Crotalaria *lupulina*, H.B. et Kunth.—*C. dichotoma*, Grah., Wlprs. Rep. vol. v. p. 447. Talisco (Lay and Collie!).

115. Crotalaria *Tepecana*, Hook. et Arn. Bot. Beech. p. 414.—Wlprs. Rep. vol. v. p. 447. Tepic (Barclay!).

116. Crotalaria *longirostrata*, Hook. et Arn. Bot. Beech. p. 285 et 414. Acapulco (Barclay!).

117. Crotalaria *Maypurensis*, H.B.K., De Cand. Prodr. vol. ii. p. 132.—*C. Acapulcensis*, Hook. et Arn. Bot. Beech. p. 414. Acapulco (Lay and Collie! Barclay!).

118. Crotalaria *incana*, Linn., De Cand. Prodr. vol. ii. p. 132. Acapulco (Barclay!).

119. Crotalaria *eriocarpa*, Benth. Bot. Sulph. p. 80 in adnot. Tepic (Lay and Collie!).

120. Hosackia *puberula*, Benth., Wlprs. Ann. vol. ii. p. 358. Chihuahua (Potts!).

121. Hosackia *angustifolia*, Don, Wlprs. Rep. vol. ii. p. 855; var. foliis latioribus, floribus pallidioribus. An sp. distincta? Sierre Madre.

122. Indigofera *lepedezioides*, H.B.K., De Cand. Prodr. vol. ii. p. 226. Chihuahua (Potts!).

123. Indigofera *Mexicana*, Benth., Wlprs. Ann. vol. ii. p. 363. Chihuahua (Potts!).

124. Indigofera *Anil*, Linn., De Cand. Prodr. vol. ii. p. 225. Tepic (Lay and Collie!).

125. Indigofera *torulosa*, Hook. et Arn. Bot. Beech. p. 286. Tepic (Lay and Collie!).

126. Eysenhardtia *amorphoides*, H.B.K., De Cand. Prodr. vol. ii. p. 257. Cerro de Pinal.

127. Dalea *lachnostachys*, A. Gray, Pl. Wright. part i. p. 46, et part ii. p. 37. Sierra Madre; Chihuahua (Potts!).

128. Dalea *pogonathera*, A. Gray, Pl. Fendl. p. 31. Chihuahua (Potts!).

129. Dalea *pectinata*, Kunth, De Cand. Prodr. vol. ii. p. 245? Sierra Madre.

130. Dalea *psoralioides*, Moric., Wlprs. Rep. vol. i. p. 652. Sierra Madre.

131. Dalea *Wislizeni*, A. Gray, Pl. Fendl. p. 32; Pl. Wright. part ii. p. 38. Neighbourhood of Durango.

132. Dalea *alopecuroides*, Nutt., De Cand. Prodr. vol. ii. p. 244. Chihuahua (Potts!).

133. Dalea *diffusa*, Moric., Pl. Amer. p. 8. t. 6.—*D. gracilis*, Hook. et Arn. Bot. Beech. p. 287 et 416. Acapulco (Barclay!); Cerro de Pinal; Tepic (Lay and Collie!).

corrected page

134. Dalea *elegans,* Hook. et Arn. Bot. Beech. p. 417.—*D. nigra,* Martens et Gall., Wlprs. Rep. vol. ii. p. 855! Cerro de Pinal; Tepic (Barclay! Lay and Collie!).

135. Dalea *flava,* Mart. et Gall., Wlprs. Rep. vol. ii. p. 855. Cerro de Pinal.

136. Dalea *elata,* Hook. et Arn. Bot. Beech. p. 416. Acapulco (Barclay!).

137. Dalea *verbenacea,* Schlecht., Linn. vol. v. p. 579. Talisco (Lay and Collie!).

138. Dalea *argyrostachys,* Hook. et Arn. Bot. Beech. p. 285. Tepic (Lay and Collie!).

139. Dalea *crenulata,* Hook. et Arn. Bot. Beech. p. 285. Talisco (Lay and Collie!).

140. Sesbania *tomentosa,* Hook. et Arn. Bot. Beech. p. 286. Acapulco (Lay and Collie!).

141. Phaca *mollis,* H.B. et K., De Cand. Prodr. vol. ii. p. 274. Chihuahua (Potts!).

142. Stylosanthes *viscosa,* Swartz, De Cand. Prodr. vol. ii. p. 317. Talisco (Lay and Collie!).

143. Zornia *reticulata,* Smith, De Cand. Prodr. vol. ii. p. 316. Cerro de Pinal.

144. Æschynomene *glandulosa,* Poir., De Cand. Prodr. vol. ii. p. 321.—*Æ. hirsuta,* Cham. et Schlecht., Linn. vol. v. p. 583.—Hook. et Arn. Bot. Beech. p. 418, et De Cand.? teste Benth. Talisco (Lay and Collie!).

145. Desmodium *Canadense,* De Cand. Prodr. vol. ii. p. 328. Sierra Madre.

146. Desmodium *cinereum,* De Cand. Prodr. vol. ii. p. 330. Talisco (Lay and Collie!).

147. Desmodium *podocarpum,* Hook. et Arn. Bot. Beech. p. 417. t. 96. Acapulco (Lay and Collie!).

148. Desmodium *triflorum,* De Cand. Prodr. vol. ii. p. 334. Acapulco (Barclay!).

149. Neurocarpum *multiflorum,* Hook. et Arn. Bot. Beech. p. 286. Tepic (Lay and Collie!).

150. Tephrosia *toxicaria,* Benth. supra, p. 107. Acapulco (Barclay!).

151. Tephrosia *Virginiana,* Pers., De Cand. Prodr. vol. ii. p. 250. Sierra Madre, in woods.

152. Tephrosia *leucantha,* H.B. et K., De Cand. Prodr. vol. ii. p. 252. Cerro de Pinal.

153. Tephrosia *sericea,* Benth. supra, p. 107. Sierra Madre.

The hair is less glossy than in the specimens collected by me in the Isthmus of Panama, and the lower leaves are larger; in other respects I do not observe any difference.

154. Tephrosia *crassifolia,* Benth., Wlprs. Rep. vol. v. p. 515. Sierra Madre; Acapulco (Barclay!).

155. Tephrosia *Madrensis,* Seem. (Tab. LXI.); suffruticosa, ramis angulatis glabris prostratis, foliis unifoliolatis ovato-oblongis acutis mucronatis coriaceis glaberrimis reticulato-venosis, stipulis ovato-lanceolatis longe attenuatis sæpe unidentatis, racemis terminalibus calycibusque adpresse puberulis 10–12-floris, calycis laciniis tubo vix longioribus, pistillo puberulo.—*Galactia marginalis,* Seem. t. 61, non Benth.! Sierra Madre.

PLATE LXI. Fig. 1, an entire flower; 2, vexillum; 3, one of the alæ; 4, carina; 5, stamens and pistil; 6, ovary and style; 7, ovary, cut open:—*all magnified.*

156. PHASEOLUS *acutifolius*, A. Gray, Pl. Wright., part i. p. 43? Sierra Madre.

157. PHASEOLUS *Hernandezii*, Savi, De Cand. Prodr. vol. ii. p. 395.—Nomen vernacul. "Frijol." Cultivated.

158. PHASEOLUS *micranthus*, Hook. et Arn. Bot. Beech. p. 217. Talisco (Lay and Collie!).

159. RHYNCHOSIA *grandiflora*, Schlecht., Hook. et Arn. Bot. Beech. p. 287. t. 59. Tepic (Barclay!), Talisco (Lay and Collie!).

160. RHYNCHOSIA *Mexicana*, Hook. et Arn. Bot. Beech. p. 287. Tepic (Lay and Collie!).

Subordo II. CÆSALPINIEÆ.

161. HÆMATOXYLON *Campecheanum*, Linn., De Cand. Prodr. vol. ii. p. 485.—Nomen vernacul. "Brazil." Common between Mazatlan and San Sebastian.

The wood, especially that of the stem, is exported as a dye; large quantities are shipped at Mazatlan.

162. POINCIANA *pulcherrima*, Linn., De Cand. Prodr. vol. ii. p. 484.—*Cæsalpinia pulcherrima*, Swartz.—Nomen vernacul. "Tabachin." Cultivated in the gardens of Mazatlan and San Sebastian, and in some parts run wild.

A decoction of the root and bark of this plant is considered by the natives as an efficacious remedy for cutaneous diseases, especially that called the Lepra in the country.

163. HOFFMANNSEGGIA *densiflora*, Benth. in A. Gray, Pl. Wright. part i. p. 55. Chihuahua (Potts!).

164. CASSIA *pauciflora*, H. B. et K. vol. i. p. 829. Cerro de Pinal.

165. CASSIA *rotundifolia*, Pers., var. *fabaginæfolia*, Benth.—*C. fabaginæfolia*, H. B. et K. in Willd. Herb. n. 7919. Cerro de Pinal.

166. SWARTZIA *grandiflora*, Willd., De Cand. Prodr. vol. ii. p. 422. Acapulco (Barclay!).

167. CASPARIA *subrotundifolia*, Kunth.—*Bauhinia subrotundifolia*, Cav., De Cand. Prodr. vol. ii. p. 512.—*B. Lunaria*, Hook. et Arn. (non. Cav.) Bot. Beech. p. 420. Acapulco (Barclay! Lay and Collie!).

168. CASPARIA *Pes-capræ*, Kunth.—*Bauhinia Pes-capræ*, Cav., De Cand. Prodr. vol. ii. p. 512. Acapulco (Barclay!).

169. CASPARIA *latifolia*, Kunth.—*Bauhinia latifolia*, Cav., De Cand. Prodr. vol. ii. p. 513. Acapulco (Barclay!).

170. BAUHINIA *inermis*, Pers., De Cand. Prodr. vol. ii. p. 514. Acapulco; Tepic (Barclay!).

Subordo III. MIMOSEÆ.

171. PROSOPIS, sp. Vicinity of Durango.

172. Mimosa *Guatemalensis,* Benth. Bot. Sulph. p. 89.—*Inga Guatemalensis,* Hook. et Arn. Bot. Beech. p. 419. Cerro de Pinal; Tepic (Barclay!); Realejo (Sinclair!).

173. Mimosa *asperata,* Linn., Wlprs. Rep. vol. i. p. 879. Tepic (Lay!).

174. Mimosa *floribunda,* Willd., Wlprs. Rep. vol. i. p. 865. Tepic (Lay!), Acapulco (Barclay!).

175. Mimosa *Grahami,* A. Gray, Pl. Wright. part ii. p. 52. Sierra Madre.

176. Acacia *Farnesiana,* Willd., Wlprs. Rep. vol. i. p. 909.—Nomen vernacul. "Visacha." Common throughout the region, covering large districts of the table-land of Durango.

177. Acacia *glabrata,* Schlecht., Wlprs. Rep. vol. i. p. 920. Baranca, near Santa Teresa, on the road from Durango to Tepic.

178. Calliandra *grandiflora,* Benth., Wlprs. Rep. vol. i. p. 926, et vol. v. p. 608.—*Inga anomala,* Hook. et Arn. Bot. Beech. p. 419. Cerro de Pinal; Tepic (Barclay!).

According to Andrieux, vernacularly termed in some parts of Mexico "Cabeza del angel."

179. Calliandra *humilis,* Benth., Wlprs. Rep. vol. i. p. 927. Chihuahua (Potts!).

180. Pithecolobium *dulce,* Benth., Wlprs. Rep. vol. v. p. 610.—*Inga pungens,* Willd.—Nomen vernacul. "Guamuchil." Cultivated about Mazatlan and San Sebastian, and naturalized in some parts.

The fruit is boiled and eaten.

ROSACEÆ.

181. Rubus *strigosus,* Michx., De Cand. Prodr. vol. ii. p. 557.—Torr. et Gray, Fl. N. Amer. vol. i. p. 453. Rancho of Guadalupe, on the road from Mazatlan to Durango; Peak of Orizaba (Galeotti, no. 3082!).

182. Rubus *trilobus,* Moz. et Sesse, De Cand. Prodr. vol. ii. p. 566.—*R. Neo-Mexicanus,* A. Gray, Pl. Wright. part ii. p. 55!

R. Neo-Mexicanus does not appear to differ from *R. trilobus,* described from a figure of Mozino and Sesse; and I consider the following specimens as belonging also to this species, viz. New Mexico (Wright, no. 1061), Oaxaca (Galeotti, no. 3098, Linden, no. 639), Veracruz (Galeotti, no. 3083), San Felipe (Andrieux, no. 393), and some other (not specified) part of Mexico (Hartweg, no. 456).

Seeds of a third species of *Rubus* (caule fruticoso, foliis 5-foliolatis utrinque pubescentibus) was sent by Mr. Potts to Mr. Scheer, from Chihuahua, but the plants raised from them have not yet flowered, and must therefore remain for the present undetermined.

183. Fragaria *vesca,* Linn., De Cand. Prodr. vol. ii. p. 569.—Torr. et Gray, Fl. N. Amer. vol. i. p. 448.—Nomen vernacul. "Fresa de la Serra." Common in the Sierra Madre; collected also in Mexico by Hartweg (no. 1715!) and Coulter (no. 94!).

Strawberries (several kinds), introduced from foreign countries, are cultivated in the gardens of Durango.

184. Alchemilla *sibaldiæfolia,* H.B. et K., De Cand. Prodr. vol. ii. p. 590. Sierra Madre.

I have seen specimens of this plant from Orizaba Peak (Galeotti, no. 559!), Zinapan (Coulter!), Quitenian Andes and Pichincha (Jameson!).

185. Cercocarpus *fothergillioides,* H.B.K., De Cand. Prodr. vol. ii. p. 589. Santa Lucia.

Also found at Zacatecas (Hartweg!), Zinapan (Coulter, no. 83!), Misteca alta, Oaxaca (Galeotti, no. 3070!), Real del Monte (Galeotti, no. 3109!), and some not specified part of Mexico (Jurgensen!).

186. Cowania *Mexicana,* Don in Linn. Trans. vol. xiv. p. 574. t. 22.—Nomen vernacul. "Romerillo cimarron." Sunny hills near Mesquital.

Zacatecas (Hartweg!); Hills on the Sonita, Sonora (Wright, no. 1058!). The flowers are cream-coloured.

187. Cratægus *Mexicana,* De Cand. Prodr. vol. ii. p. 629.—Nomen vernacul. "Tejocote." About Durango, wild, also cultivated on account of its edible fruit.

COMBRETACEÆ.

188. Conocarpus *erectus,* Jacq., De Cand. Prodr. vol. iii. p. 16. Tepic (Lay!).

189. Combretum *farinosum,* H.B.K., De Cand. Prodr. vol. iii. p. 19. Tepic and Acapulco (Lay and Collie!).

190. Combretum *Mexicanum,* H.B.K.? De Cand. Prodr. vol. iii. p. 19. Acapulco (Lay and Collie!).

RHIZOPHOREÆ.

191. Rhizophora *Mangle,* Linn., De Cand. Prodr. vol. iii. p. 32. Common along the coast.

ŒNOTHEREÆ.

192. Jussiæa *peploides,* H.B.K., De Cand. Prodr. vol. iii. p. 53. Tepic and Talisco (Lay and Collie, Sinclair!).

193. Jussiæa *octofila,* De Cand. Prodr. vol. iii. p. 57.—*J. hirta,* Hook. et Arn. Bot. Beech. p. 421. vix Vahl, sec. Benth. Tepic (Lay! Barclay!).

194. Semeiandra *grandiflora,* Hook. et Arn. Bot. Beech. p. 291 et 422. t. 59.—Bot. Mag. t. 4727! Sierra Madre; San Blas to Tepic (Coulter, no. 180!), Tepic (Lay!), Manzanilla Bay (Barclay!).

195. Diplandra *lopezioides,* Hook. et Arn. Bot. Beech. p. 292 et 422. t. 60. Tepic (Lay! Sinclair!); some other part of Mexico, not specified (Bates!).

Bark of the stem and branches peeling off, like that of some *Fuchsias.*

196. Lopezia *hirsuta,* Jacq., De Cand. Prodr. vol. iii. p. 62. Tepic (Sinclair!), Talisco (Lay and Collie!).

197. Lopezia *racemosa,* Cav., De Cand. Prodr. vol. iii. p. 62. Sierra Madre, frequent.

198. Fuchsia, sp. (Leaves only.) Sierra Madre, near Santa Lucia.

LYTHRARIEÆ.

199. Ammannia *latifolia*, Linn., De Cand. Prodr. vol. iii. p. 78.—*A. hastata*, De Cand. l. c.—*A. catholica*, Hook. et Arn. Bot. Beech. p. 289, non Cham. et Schlecht.! Tepic (Lay!).

200. Ammannia *humilis*, Michx., De Cand. Prodr. vol. iii. p. 79.—*A. sanguinolenta*, Hook. et Arn. Bot. Beech. p. 289, nec Swartz! Tepic (Lay!).

201. Cuphea *Llavea*, La Llav. et Lexarz., De Cand. Prodr. vol. iii. p. 85.—*C. barbigera*, Hook. et Arn. Bot. Beech. p. 422! Cerro de Pinal; Sierra Madre; Zacatecas (Hartweg, no. 25!), Chihuahua (Potts!), San Blas to Tepic (Sinclair!), Tepic (Barclay!), Tepic to Guadalajara (Coulter, no. 148!).

The people living about the Cerro de Pinal term this plant "Yerba de San Pedro," and use it against fever. The petals of the specimens from Chihuahua are by far the largest.

202. Cuphea *Hookeriana*, Wlprs. Rep. Bot. vol. ii. p. 107.—*C. floribunda*, Hook. et Arn. Bot. Beech. p. 289, nec Lehm. Sierra Madre; from San Blas to Tepic (Sinclair!), Tepic (Barclay!).

203. Cuphea *calcarata*, Benth. Pl. Hartweg. p. 7.—Wlprs. Rep. vol. ii. p. 108. Sierra Madre; Real del Monte to Zacatecas (Coulter!).

204. Cuphea *tenella*, Hook. et Arn. Bot. Beech. p. 289.—Wlprs. Rep. vol. ii. p. 108. Tepic (Lay!).

205. Cuphea *æquipetala*, Cav., De Cand. Prodr. vol. iii. p. 85. Talisco (Lay and Collie!).

206. Cuphea *bracteata*, Hook. et Arn. Bot. Beech, l. c. Tepic (Lay!).

207. Heimia *salicifolia*, Link et Otto, De Cand. Prodr. vol. iii. p. 89. San Blas to Tepic (Lay and Collie!).

MELASTOMACEÆ.

208. Heterocentron *Mexicanum*, Hook. et Arn. Bot. Beech. p. 290 et 423!—Naud. Melast. p. 248. Sierra Madre; San Blas to Tepic (Sinclair! Lay!).

209. Monochætum *myrtoideum*, Naud. Melast. p. 256.—*Arthrostemma myrtoideum*, De Cand. Sierra Madre.

210. Miconia? sp. Sierra Madre.

Specimens in fruit only, and therefore not determinable; they are no. 2172 of my collection.

211. Conostegia *Xalapensis*, Don, Naud. l. c. p. 393. Acapulco (Barclay!), Talisco (Lay and Collie!).

MYRTACEÆ.

212. Eugenia? sp.—Nomen vernacul. "Aragon." Woods near San Sebastian.

A tree from 50 to 60 feet high; young branches and petioles slightly pubescent; leaves elliptical, acuminate, glabrous; flowers and fruit wanting, hence undeterminable.

The two *Myrtaceæ* from Mexico, enumerated by Hooker and Arnott, are also too imperfect to be made out; if one of them be *Myrtus communis*, it must be cultivated.

CUCURBITACEÆ.

213. Bryonia *attenuata*, Hook. et Arn. Bot. Beech. p. 424.—*Anguria? dubia?*, Hook. et Arn. l. c. p. 294! Tepic and Acapulco (Lay and Collie!).

214. Momordica *Balsamina*, Linn., De Cand. Prodr. vol. iii. p. 311. Tepic (Lay!).

215. Luffa *quinquefida*, Seem.—*Elaterium quinquefidum*, Hook. et Arn. Bot. Beech. p. 292. Acapulco (Lay and Collie! Sinclair!)

216. Sicyos *vitifolius*, Hook. et Arn. Bot. Beech. p. 292, et Willd.? Tepic (Lay!).

217. Gronovia *scandens*, Linn., De Cand. Prodr. vol. iii. p. 320. Tepic (Lay!).

PASSIFLORACEÆ.

(*Passifloreæ! Turneraceæ! Malesherbiaceæ!*)

218. Passiflora *viridiflora*, Cav., Hook. et Arn. Bot. Beech. p. 292. Acapulco (Lay and Collie!).

219. Passiflora *pannosa*, Hook. et Arn. Bot. Beech. p. 293, et Smith? Talisco (Lay and Collie!).

220. Turnera *tomentosa*, H.B.K., De Cand. Prodr. vol. iii. p. 347? Tepic (Lay!).

CACTEÆ.

(*Auctore F. Scheer.*)

Having furnished Dr. Seemann with letters to Mr. John Potts, manager of the Mint at Chihuahua, we might have expected, from the zeal and labours of both gentlemen, a large addition, not only to our knowledge of *Cacteæ*, but of many other plants, of which that district seems to contain much as yet unknown. Dr. Seemann was not able to extend his journey so far north; and, as it is not likely that other travellers will soon venture into a region so difficult of access and so full of perils, it appears desirable that what has been collected by Mr. Potts should no longer remain unpublished.

Ever since 1842, Mr. Potts has sent me plants almost annually; these were found, either by himself, about the city of Chihuahua, or on short excursions from thence, or by his brother, the late Mr. Frederick Potts, who resided chiefly on the borders of the State of Sonora. The difficulties which these gentlemen had to contend with were not small,—personal danger from the Comanches and other tribes of Indians to whoever ventures beyond the immediate precincts of towns or haciendas being of constant occurrence. The trouble of forwarding what had been collected was considerable. Much was lost before an opportunity to despatch packages offered; some of these were six months or more on their way to England; some never reached their destination, amongst which was a large case entrusted to an American traveller, containing, among other things, a pine-cone of an unusual size, and weighing about eighteen pounds! A very large collection was brought by Mr. Potts himself in 1850. It is also needless to add that many plants would arrive in a very dilapidated condition.

Being myself at first but slenderly acquainted with this tribe of plants, and not wishing to increase the confusion of nomenclature with which its study was and still is encumbered, I abstained in most instances

from naming, or inducing others to name, these collections, except where several specimens, or a perfectly new and reliable character, rendered hesitation unnecessary. Those few that are found elsewhere I have carefully pointed out; many however are perfectly new, and quite unknown, except to Mr. Potts and myself. I have nevertheless limited myself to ranging these plants in their proper places according to the elaborate and accurate system established by His Serene Highness Prince Joseph of Salm-Dyck, believing that this plan will be found quite sufficient, with the descriptions added, to allow of every species being identified, should we be favoured with another supply from the same localities. The few species that have been named, generally with the kind assistance of His Serene Highness, have been so described, that all chance of synonymic confusion is obviated. Of those not named, if identified by others, it would be but a grateful testimony to the zealous exertions of the collectors to insert, when finally described and named, the numbers here given.

As connected with the voyage of the 'Herald,' it may be proper to add that Mr. J. Goodridge, surgeon, found a *Mamillaria* on the island of Cerros, east of California, which was by me forwarded to Prince Salm-Dyck, unfortunately in a very imperfect state. It has been placed by him under his *Mamillariæ heterochloræ*, page 10 of his Enumeration, and is described by him as *Mamillaria Goodridgii*, Scheer, thus:—"M. caule erecto cylindraceo basi ramoso, axillis nudis, mamillis confertissimis parvulis viridibus, pulvillis nudis, aculeis exterioribus 12 diaphane albis rigidiusculis subtessari-patentissimis intertextis, centralibus 4 longioribus, basi albidis superne brunneis, infimo validiore uncinato." The Prince seems to think that it approaches to *M. Beneckei*, Ehrenb., but that, on comparing the actual plants, does not appear to me to be the case. About Guaymas a *Mamillaria* somewhat similar to *M. Goodridgii* was found, but more like a *Mamillaria anguinea*, with a central spine strong and hooked; also a very robust species of *Mamillaria sphacelata*.

221. Mamillaria *Schelhasii*, Pfr., δ *triuncinata*, Salm-Dyck, Cacteæ in Hort. Dyck. p. 81. Cult. a. 1849.

Prince Salm-Dyck has named this plant from small seedlings; but the original plant (soon dead) bore no resemblance to *M. Schelhasii*, the external spines being hard of texture and closely adpressed to the body. None of my seedlings grew to any size, and Mr. Potts told me that he had not been able to preserve this plant long in cultivation, and that he found, in fact, the same difficulty with many other *Cacteæ* at Chihuahua.

Hort. Dyck. p. 8.

222. Mamillaria *senilis*, Lodd, S. D. p. 82.

This plant grows on the tops of mountains near Chihuahua [and in the Sierra Madre, on rocks, *Seem.*], and during winters is covered with snow. The plants all arrived dead. I have seedlings, but they do not flourish under the influence of an English climate.

H. D. p. 8, post *Mamillariam Humboldtii.*

223. Mamillaria *saxatilis*, Scheer.

This small plant grows in the crevices of rocks near Chihuahua, and is as difficult to see as to extract from its site. The Prince, to whom I sent one of two plants, soon dead, thought it to have great affinity with *M. Humboldtii*, which however grows in meadows near Guanajuato, and is described with "spinis niveis," whereas the present specimen was "*M. cylindrica*, aculeis eburneis quasi stramineis." Received 1847.

224. Mamillaria *Leucodasys*, S. D. in literis. Species distinctissima, sed eheu! emortua, ut recte describi non possit. Planta parvula ovata 1½″ alta, apice umbilicato caduco rubro-barbato; mamillis aculeisque minutissimis quasi velumino albo plantam occultantibus; aculeis sub lente diaphano-albis, reflexo-radiantibus, biserialibus; serie inferiori sub-16, superiori 8 brevioribus. Received 1850.

H. D. p. 9, post *Mamillariam formosam.*

225. MAMILLARIA sp.; species magna subovata 5″ alta, 3″ lata, primo aspectu *Mamillariæ formosæ* affinis, sed differt mammillis confertis elongato-tetragonis, spinis centralibus 6 robustis.

This fine plant soon died. Received 1850.

226. MAMILLARIA sp.; magna, ovata, mammillis tenuibus tetragonis, spinis centralibus 2-setosis sursum deorsum spectantibus, exterioribus numerosissimis totam plantam dense tegentibus. Received 1850.

H. D. p. 12. § 5. Stelligeræ.

227. MAMILLARIA sp.; parvula, tenuibus affinis, emortua. Received 1850.

H. D. p. 13.

228. MAMILLARIA *Pottsii,* Scheer, S. D. p. 104.

Grows on limestone rocks near Chihuahua, at an elevation of 6000 to 7000 feet. Like many others, it will not succeed with me. Probably great heat in summer, and great cold in winter, with a snow covering, are essential to its well-being. There are three or four marked varieties of this plant. Received 1845.

229. MAMILLARIA *strobiliformis,* Scheer, S. D. p. 104. Received 1846.

H. D. p. 13, post *Mamillariam radiantem.*

230. MAMILLARIA sp. Species *radianti* affinis, parvula, læte viridis, cylindracea; planta emortua. Received 1847.

231. MAMILLARIA sp. M. *radianti* affinis, magna, robusta, altitudine 7″, latitudine 4½″, spinis radiantibus, ½″ longis plusve, intertextis, plantæ confertim adpressis, sub-18, griseo-albis, centralibus nullis; planta emortua. Received 1849.

H. D. p. 13, post *Mamillariam similem.*

232. MAMILLARIÆ inter se affines tres emortuæ.—~~31~~, species elongato-cylindrica, apice tricipite, axillis albo-lanuginosis, mammillis subcylindricis plantæ sursum adpressis, læviter supra sulcatis, griseo-viridibus, aculeis albis, centralibus 4, exterioribus sub-22, subsetosis.—~~11~~, spinis albis; 12, spinis rubro-brunneis, ambo pyramidales ad basin proliferæ. Received 1842.

H. D. p. 13, post *Mamillariam parvimammam.*

233. MAMILLARIA sp. (Missouriensis?); parvula, subglobosa, viridis; mammillis repandis elongatis cylindricis, superne sulculo albo lanato munitis; axillis nudis; pulvillis rotundatis albidis; spinis exterioribus 12 plusve rectis radiantibus tenuissimis albis, inferioribus (½″ longis) longissimis, interioribus rubris, 3 superioribus plantæ adpressis cum una centrali recta porrecta. Received 1854.

H. D. p. 14, post *Mamillariam nivosam.*

234. MAMILLARIA sp.; subcylindrica, pallide viridis, apice parum impresso; axillis albo-lanatis setosisque; interstitiis lanuginosis; mammillis confertis brevibus subconicis; areolis rotundis mox nudis; aculeis sublaxis, exterioribus sub-20 subsetosis albis subfasciculatis reflexo-radiantibus, interioribus sub-4, paullo robustioribus subulatis, nascentibus rubellis, deinde dealbescentibus. Planta prolibus ample munita. Received 1850.

235. MAMILLARIA sp. (species speciosissima); subcolumnaris, robusta, superne applanata, obscure subglauca nitida; mammillis confertis rhomboideis; pulvillis parum infra apicem mammillarum im-

pressis, deorsum in sulculo expansis, albo-lanuginosis, mox nudis; axillis setis lanisque albis munitis; spinis exterioribus sub-30 diaphano-albis setiformibus radiantibus inferioribus longioribus, interioribus 4 vel 6, sublongioribus rectis suberectis, nascentibus purpureis deinde brunneis, ½″ longis. Received 1850.

236. Mamillaria *Rhodeocentra, β gracillima,* S. D. p. 109, sed incerta, quod planta mea multo grandior illæ quam ad Serenissimum Principem misi, quoque regione differt. Species magna robusta globosa, apice umbilicato; axillis lanatissimis deinde nudis; mammillis subangularibus basibus rhombeis; areolis magnis subellipticis infra apicem mammillarum impressis subnudis; aculeis centralibus 5, hinc inde 6, crassis subulatis subrectis irregulariter divergentibus, exterioribus sub-28 setaceis inequalibus crispis fasciculatis, inferioribus longioribus rectioribus.

237. Mamillaria *glabrata,* S. D. p. 109.

Not common, as mentioned by Salm-Dyck, nor received from the Royal Gardens at Kew, but only through Mr. Potts, who tells me that this plant shrinks during winter into the ground, and reappears in spring.—Dead. 1845: received repeatedly since.

238. Mamillaria sp.; robusta depressa globosa, pallide viridis, mammillis magnis ovatis, pulvillis albo-tomentosis floccosis, *floccis mammillas dimidio tegentibus;* spinis exterioribus 13, quarum 4 superioribus brevibus, 9 inferioribus multo longioribus pollicaribus plusve, cum 4 interioribus divergentibus pallide roseis. Planta emortua! Received 1849.

239. Mamillaria sp.; robusta, obscure viridis, subcylindrica, triceps; mammillis ovatis confertis; spinis exterioribus 15 subæqualibus, superioribus brevioribus, interioribus 4 longioribus (quarum 3 recurvis 1–1½″ longis, et 1 inferiore rectiore longissime) nascentibus rubro-brunneis, deinde griseis. Received 1850.

240. Mamillaria sp. (speciei ~~19~~ 239 subaffinis, sed mammillis majoribus); pallide viridis, subpyramidalis, superne applanata et multo lanuginosa; mammillis subquadrangularibus, pulvillis nascentibus lana alba multo munitis deinde subnudis, infra apicem in sulculo ovato elongatis; interstitiis lanatis; spinis exterioribus sub-13 subsetiformibus diaphanis, interioribus 4 longioribus, pollicaribus, rectis, cruciatim divergentibus, nascentibus brunneis mox griseis. Received 1850.

241. Mamillaria *spinaurea,* S. D.—Otto et Dietr. Allg. Garten. Jahrg. 1850. no. 50. Planta mea emortua, magna robusta depressa globosa; diametro 5″, altitudine 3½″. Received 1849.

242. Mamillaria *Seemannii,* Scheer; mamillaria hemisphærica robusta, subapplanata apice impressa, sub 4″ diametro 3″ altitudineque; axillis primum nudis mox albissime lanuginosis; mammillis subovatis elongatis murco-viridibus minute punctatis; pulvillis mox nudis; aculeis exterioribus radiantibus subæqualibus subeburneis nascentibus rubellis 11–13 sub 3″ longis, cum uno centrali breviori subulato atro-purpureo mox albo recto erecto.

This plant, with *Mamillaria Salm-Dyckiana* et *spinaurea,* came probably from Sonora or from Durango, in which latter place Dr. Seemann has seen it, and says that, together with other species, it is used for culinary purposes. Received 1850.

H. D. p. 14, post *Mamillariam proceram.*

243. Mamillaria sp.; parvula, pallide viridis; mammillis subtetragone pyramidatis; aculeis brevissimis, exterioribus sub-13 setosis præsingulariter radiante-reflexis, centrali uno robusto erecto. Species distinctissima. Planta mox emortua. Received 1850.

244. Mamillaria sp.; læte viridis, mammillis latis depressis, subtetragonis; setis exterioribus sub 30, $\frac{1}{2}''$ longis albis laxo-crispatis, centralibus 4–5 robustioribus rectis, totis eburneis. Planta emortua. Received 1850.

245. Mamillaria sp.; viridis; mammillis nascentibus obscure tetragonis elongatis, deinde brevioribus, ultimo depresso-applanatis acuto-quadrangularibus; aculeis interioribus 6 brunneis; exterioribus 24 minutis albis. Planta emortua. Received 1850.

The change in the shape of the mammillæ was a very remarkable circumstance.

H. D. p. 19. § 10.

246. Mamillaria sp.; emortua: species *M. rhaphidacanthæ* subaffinis. Received 1846.

247. Mamillaria *heteromorpha*, Scheer, S. D. p. 128. Emortua. Received 1842.

H. D. p. 20. § 11†.

248. Mamillaria; species corniferæ affinis, aculeo centrali deorsum multissime incurvato. Emortua. Received 1848.

249. Mamillaria sp.; *M. Scolymoidei* subaffinis, magna robusta ovata obscure viridis, prolifera, apice sublanuginoso parum impresso; axillis mox nudis; mammillis primum subconicis, deinde turgido-triangularibus, superne subsulcatis, plantam sursum adpressis, magnis, pollicaribus; sulcis glandulis munitis; aculeis flexuosis, exterioribus sub 16 subfasciculatis radiantibus, inferioribus longissimis, centrali uno (hinc inde 2 vel 3) multo longiore robustiore curvato-porrecto. Emortua. Received 1845.

250. Mamillaria sp.; *M. Scolymoidei* affinis, ovata, dura, pallide viridis apice multo-lanuginoso; mammillis superne adpressis; aculeis triformibus; exterioribus sub 15, id est semper 7 inferioribus rectis subapplanatis radiantibus $\frac{1}{2}$ longis diaphanis, 8 plusve superioribus duplo longioribus tenuioribus teretibus flexilibus erectis reflexis subfasciculatis, dimidio superiori subnigri, cum 4 interioribus cruciatim dispositis deorsum curvatulis. Received 1850.

251. Mamillaria sp.; *M. Scolymoidei* affinis, magna dura robustissima erecta cylindrica distincte columnaris, altitudine $7''$, latitudine $4''$ brunnea, ad basin prolifera. Emortua. Received 1850.

H. D. p. 20. § 11††.

252. Mamillaria *Salm-Dyckiana*, Scheer, H. D. p. 134.—Otto et Dietr. Allg. Gartenz. Jahrg. 1850. no. 50.—Grows on limestone mountains thirty miles north-west from Chihuahua, in company with *M. Pottsii*. Var. β comes probably from Sonora. Received 1845. Emortua. Adest varietas spinis rectis brevioribus nigris.

253. Mamillaria *Scheerii*, Mühlenpf. H. D. p. 134.—Bacca elongata $2''$ longa, pallide lutea.—Grows in red sandy loam around Chihuahua. Emortua. Received 1845.

H. D. p. 20. § 11†††.

254. Mamillaria sp.; *M. Elephantidenti* vel *Echinocactoidei* subaffinis, sed mammillis parvulis. Emortua.

255. Echinocactus *horizonthalonius*, Lem.—*M. equitans*, Scheid. *Echinoc.* magnus robustus $7''$ altus $''$ 8 latus, 8-costatus; costis repandis; spinis uncialibus; inferioribus semper 4 subæqualibus

annulatis subapplanatis rectis patenti-divergentibus, 3 superioribus sursum recurvatulis cum 4 plusve subbrevioribus subsetiformibus adventitius.—Planta emortua. Received 1850.

256. Echinocactus *horizonthalonius*, var. *β curvispina*, S. D.—Planta emortua; differt ab *E. horizonthalonio* spinis longioribus 1½″ plusve, semper 4 exterioribus cruciatim dispositis cum 2 centralibus sursum deorsum spectantibus, omnibus æqualibus arcuato-recurvatis. Received 1842, 1845, 1850. Præterea varietas est cum spinis brevibus applanatis.

These plants grow abundantly in sandy plains near Chihuahua.

257. Echinocactus sp. nov.; *E. horizonthalonio* remote affinis; robustus applanato-globosus; *costis* 21 *saturate viridibus, acutis;* pulvillis magnis *cordatis* 2″ *distantibus;* aculeis robustis applanatis annulatis pollicaribus plusve longis; exterioribus 6 cum uno superiori sursum spectanti, patentibus, centrali uno longiore deorsum adpressis; bacca coccinea nitida depressa globosa molli diametro ¾″. Planta emortua. Received 1850.

H. D. p. 27 ut supra, post *Echinocactum hystrichacanthum.*

258. Echinocactus sp. nov.; luteo-viridis scabratus depresso-globosus robustus; costis 13, angulis rectis superne acutis, basibus versus repandis; areolis griseo-velutinosis elongatis hinc inde connatis; aculeis 9–11 longissimis teretibus subrecurvatis annulatis brunneo-luteis; centrali sublongiori 2½–3″ longi porrecto.

Of this I have two plants still living, but they have not flowered: diameter 8″, altitude 5″. Received 1850.

H. D. p. 28. § 3**.

259. Echinocactus *Wislizenii*, Engelman.

Of this species Mr. Potts brought me, in 1850, two large plants, 2½ feet high and 1½ feet thick, weighing each upwards of 200 lbs. I calculated the spines on each plant to be at least 8300. Both plants died soon after I got them. A plant not dissimilar, but of gigantic proportions, more than man's height, grows in California. Captain Kellett took two plants from California to Oahu, where they remained with the English consul. The Captain gave me some seeds, which however did not vegetate; it was smaller than that of my plants. It would appear that there are, in the neighbourhood of Chihuahua, two distinct species; the seeds which Mr. Potts sent me differed in size from those contained in the fruit which crowned one of my plants, and the seedlings obtained differ altogether.

260. Echinocactus sp.; parvula, mammillaribus tenuibus subsimilis, cum aculeo centrali albohamato porrecto. Planta emortua. Received 1842.

261. Echinocactus *longihamatus*, Gal. Planta altitudine 7″. Received 1850.

262. Echinocactus *uncinatus*, Engelman. Received 1850.

263. Echinocactus; species pro aculeis longihamato affinis, sed depresso-globosa, costis 12 (*E. Karwinskii* similis) crassis macragonis.

This plant has come from various parts of Mexico, and has frequently flowered in the Kew Gardens. The flower is pale yellow; that of *E. longihamatus*, according to buds, which however have not opened, would seem to be reddish. Received 1845.

264. Echinocactus *Scheerii*, S. D. (Hort. Dyck. pag. 155). Received 1847.

265. Echinocactus sp.; *E. Scheerii* affinis, subtuberculatusæ ruginosus primo aspectu *Mamil-*

lariæ similis; spinis exterioribus sub 20 acicularibus recurvo-radiantibus, interioribus multo longioribus 2 vel 3 superioribus pollicaribus plusve, griseis applanatis, rectis erectis cum centrali subbreviore porrecta brunnea uncinata; *radice carnosa elongata* 3–6-*unciali ad basin tuberibus* Solano tuberoso *similibus munita.* Received 1850.

266. Echinocactus sp.; globosus, robustus, altitudine 7″, latitudine 8″, 8-costatus; costisque sinubus repandis subtortuosis; areolis subremotis; aculeis 11–12, pollicaribus, subrobustis, annulatis, rubris albisque bicoloribus, superiore uno sublongiore robustiore applanato erecto cum duobus adventitiis subsetaceis, centrali uno brevissimo, exterioribus sub 8 reflexo divergentibus quasi crispis.

The colour of the spines of this plant (soon dead) resembled those of *E. bicolor*, with which it had however no other affinity.

H. D. p. 27, post *Echinocactum Californicum.*

267. Echinocactus *Pottsi*, S. D.—(Otto et Dietr. Allg. Gartenz. 1850. no. 50); variat planta spinis centralibus, 2 etiam 3, cum nonnullis superioribus setaceis. Received 1847.

H. D. p. 35. § 8*.

268. Echinocactus *bicolor*, Galeotti. Planta emortua. Received 1842.

Var. β. *Pottsi*, S. D. 1845. Planta emortua.

Var. γ; elongatus, cylindricus, aculeis luteis interdum rubris. Received 1847–50.

H. D. p. 35. § 8**.

269. Echinocactus *Lophothele*, S. D. (Otto et Dietr. Allg. Gartenz. 1850. no. 50); flores magni, 1½″ alti, phyllis sepaloidibus obovatis rubro-purpureis ad margines læte fimbriatis; petaloidibus laxis erectis lineari-lanceolatis, carneis, linea media purpurea notatis; stamina numerosa, antheræ minutæ subcrocei; stigmata 9 subradiata aurantiaca. Received 1850.

H. D. p. 41. § 1*†. *Pentalophi.*

270. Echinocereus *subinermis*, S. D. in literis. Planta distinctissima, clavata vel subglobosa, æruginosa, 5- vel 6-costata, subnuda quasi inermis, costis acutis repandis; areolis 6″ distantibus minutis; aculeis 3–4 minutissimis, sub lente subulatis. Flos magnus, speciosissimus, luteus. Tubus abbreviatus, subpollicaris. Petala pallide lutea, spathulato-lanceolata, ad margines superne erosa, apice acuta. Stamina collecta stylo adpressa, filamentis flavidis antherisque croceis. Stylus staminibus longior, stigmata 8 viridia. Planta emortua. Received 1845 and afterwards.

This plant bears no resemblance to any *Echinocereus* received; but, on account of its large flowers and green stigmas, cannot be ranged under any other division. There are varieties, one with three or four long spines closely adpressed to the plant, but not altering its general aspect.

†† *Decalophi*, post *C. coccineum.*

271. Echinocereus *Salm-Dyckianus*, Scheer. Species præsingularis, Cereis flagriformibus similis bipedalis plusve et diametro vix pollicari; caule cylindraceo ad basin et superne valde prolifero, decumbente, carnoso, submolli, 7–8-sulcato; costis repandis, subtuberculatis; pulvillis approximatis, junioribus gilvo-tomentosis, aculeis gracilibus rectis, exterioribus 8–10-radiantibus, interiore 1 (interdum 2 vel 3) duplo longiore plusve et paulo validiore, ad basin subnoduloso porrecto, omnibus griseis. Received 1847.

272. Echinocereus *Scheerii*, S. D.—Hort. Dyck. p. 191. 1845.

Var. β. *nigrispinus.* Planta emortua. Received 1850.

273. ECHINOCEREUS sp. Subcolumnaris robustus, multo horizontaliter rugosus, obscure viridis, hinc inde supra pulvillos proliferus vel viviparus, 9-costatus; costis subtortuosis acutis remotis subtuberculatis; sinubus repandis; tuberculis ½″ distantibus; pulvillis albis mox evanescentibus; aculeis subulatis rubro-brunneis, exterioribus sub 8 longitudine 1½″ subpectinato-reflexis plantæ adpressis, interioribus sub 4 longioribus inferiore 2½″ longo. Received 1845.

274. ECHINOCEREUS sp.; præcedenti subaffinis, viridis, 10-costatus; costis rectis acutis; sinubus latis; pulvillis approximatis rotundatis; spinis subintertextis, subrubris, exterioribus sub-10-uncialibus, centrali uno deflexo-porrecto 1½″ longo. Received 1850.

275. ECHINOCEREUS sp. Subcylindricus 9-costatus pallide viridis, aculeis eburneis, exterioribus 10–12, interioribus 1–3, interdum bipollicaribus. Received 1850.

276. ECHINOCEREUS sp. Subrobustus, ovato-cylindricus, multiceps, proliferus, pallide viridis, 12-costatus; costis subrepandis triangulatis rectis; sinubus acutis; areolis distantibus albo-lanatis; aculeis 1½″–2″ longis, diaphano-albis sublaxis, exterioribus 8–10 subæqualibus, plantæ adpressis, 2 superioribus longioribus cum centralibus 1, 2 vel 3 longissimis, subporrectis; caulis altitudine 2–3″, diametro 1½″. Received 1850.

277. ECHINOCEREUS sp. Subcylindricus 13-costatus, costis compressissimis; aculeis exterioribus 15, albis, centrali uno rubro vel bicolore *uncinato*. Received 1850.

278. ECHINOCEREUS sp. Robustus, griseo-viridis, submollis, vix costatus tuberculatusque, subcæspitosus et proliferus; prolibus primum viridibus mox discoloribus; spinis longissimis griseis rectis applanatis vel angulatis, exterioribus subreflexis intertextis 2″ longis plusve, interioribus sub 3 ultra 3″ longis. Altitudine 4″, diametro ad basin 2″. Received 1845.

CEREASTRI PECTINATI, *Hort. Dyck. p.* 42.

279. CEREUS *pectinatus*, Engelm., Reichardt, etc.—Hort. Dyck. p. 192. Received 1842.

280. CEREUS sp. *C. pectinato* affinis. Planta dura ferruginosa spinosissima; areolis multo approximatis; spinis crispis, subapplanatis, erectis recurvis, rubellis. Received 1850.

281. CEREUS sp. *C. pectinato* affinis. Planta dura, spinis illis Echinocacti Scopi similibus, sed robustioribus, subrubris. Received 1845.

282. CEREUS sp. *C. pectinato* affinis, sed aculeis distinctis, paucis, 6–8 elongatis plantæ adpressis subintertextis. Received 1842.

283. CEREUS sp. *C. pectinato* affinis. 16-costatus, spinis exterioribus paucis 12–15 plantæ adpressis cum hinc inde una centrali, elongata recte porrecta, ultima decipiente; areolis nudis, elongatis, nascentibus luteis, deinde brunneis, verticaliter-fissis. Received 1848.

284. CEREUS sp. præcedenti subaffinis, sed spinis distinctissime gracilioribus, eburneis; exterioribus plantæ adpressis deorsum curvatis, cum una centrali robusta rubra sphacelata. Received 1849.

285. CEREUS sp. *C. pectinato* affinis. Biceps, saturate viridis, multo costatus; costis sub 12 acutis repandis, subtuberculatis; pulvillis elongatis apicem tuberculosum tegentibus, lana alba, mox evanescenti copiose munitis; spinis exterioribus 4‴ longis, rubris, mox hinc inde albescentibus, sub 12 rectis

nascentibus suberectis deinde patentibus, acicularibus, cum una centrali valide subulata sursum recurvatula multo robustiore brunnea sphacelata, unciali. Planta parvula, altitudine 1½″, diametro 1″. Received 1854.

286. Cereus? vel Echinocereus? Planta cylindrica erecta, griseo-viridis, 13-costata; costis nascentibus subcompressis deinde subrotundatis, verticaliter dispositis; areolis unguem distantibus nascentibus albo-lanuginosis mox nudis; aculeis albis acicularibus rectis, exterioribus 13 subinæqualibus, inferioribus longioribus, interioribus 4 cruciatim positis, cum uno centrali longissime deorsum reflexo. Received 1847.

287. Species precedenti (21) affinis, sed multo robustior, multo-costata, spinis elongatis albis cum centrali una. Received 1849.

These two plants are distinct from all the preceding, and their proper position cannot yet be fixed.

288. Cereus *Pottsii*, S. D.—H. D. p. 208. Received 1845.

289. Opuntia *Engelmanni*, S. D. p. 67.

290. Opuntia *Pottsii*, S. D. p. 67.

291. Opuntia sp. spinis rectis elongatis, 2–3″ longis.

292. Opuntia *tunicata*, Lehm.—*O. exuviata a*, DC. Pfr. p. 73.

293. Opuntia *imbricata*, Haw.—S. D. p. 73.

294. Opuntia *leptocaulis*, DC.—S. D. p. 73.

295. Opuntia *frutescens*, Engelm.—S. D. p. 73.

296. Opuntia sp. *O. mycrodasi* affinis.

297. Opuntia sp. *O. robustæ* vel *albicanti* affinis, sed incerta.

CRASSULACEÆ.

298. Echeveria *Scheerii*, Lindl. Bot. Reg. (New Series) vol. xviii. t. 27.—Wlprs. Rep. vol. v. p. 794. Chihuahua (Potts!).

First introduced into England by Mr. Potts.

FOUQUIERACEÆ.

299. Fouquiera *formosa*, H.B.K., De Cand. Prodr. vol. iii. p. 349. Talisco (Lay and Collie!).

HYDRANGEACEÆ.

300. Hydrangea *Peruviana*, Moric., De Cand. Prodr. vol. iv. p. 14. Sierra Madre, in barancas, climbing and rooting on old trees, like Ivy.

It is the first time, I believe, that this species has been found in Mexico; it has repeatedly been met with in New Granada (W. Lobb! Purdie! Linden, no. 294! Jervise!).

PHILADELPHEÆ.

301. PHILADELPHUS *Mexicanus*, Schlecht.—*P. affinis*, Schlecht. !—Wlprs. Rep. vol. ii. p. 151.—*P. serpyllifolius*, A. Gray, Pl. Wright. part i. p. 77 !—*P. myrtoides*, Bertol. Fl. Guatimal. p. 21. t. 8 !—Nomen vernacul. "Mirto." Extensively cultivated in the gardens of Durango, as well as in other parts of Mexico.

This species varies a great deal in the length of its branches, and the size of its foliage and flower. Gray's *P. serpyllifolius* is an extreme form, which I too should have looked upon as a good species if I had not seen numerous intermediate states—beginning with what Gray terms *P. serpyllifolius*, var. foliis floribusque majoribus (Pl. Wright. part ii. p. 64), and my Durango specimens connecting it with those in which the branches are long and slender, the leaves larger and less covered with hair, and the flowers possessing a larger diameter.

Geographical distribution: Tolucca (Andrieux, 373 !); Hacienda del Carmen (Hartweg, no. 458 !); Zinapan (Coulter, nos. 77 and 78 !); Chalco (Andrieux, 374 !); Conejan, State of Veracruz (Linden, 580 !); Jalapa, where it is cultivated, and almost grows wild (Herb. Hook.); New Mexico (Wright !).

UMBELLIFERÆ.

302. ERYNGIUM *Wrightii*, A. Gray, Pl. Wright. p. 78.—*E. tenue*, Hook. et Arn. Bot. Beech. p. 293. (non Lam.) ? Talisco (Lay and Collie !).

The specimen upon which *E. tenue* of Hooker and Arnott was founded appears to me to be a crippled state of *E. Wrightii*, Gray.

303. ERYNGIUM *Cervantesii*, Laroch., De Cand. Prodr. vol. iv. p. 92. Talisco (Lay and Collie !).

304. ERYNGIUM *Beecheyanum*, Hook. et Arn. Bot. Beech. p. 294. Sierra Madre; Talisco (Lay and Collie !); Tepic (Barclay !).

Does not seem to me, as has been supposed, a form of *E. ramosum*, Laroch.; the radical leaves are spathulato-obovate and entire, resembling at first sight those of *E. fœtidum*, Linn.

305. ERYNGIUM *pectinatum*, Presl, De Cand. Prodr. vol. iv. p. 96. Sierra Madre; Tepic (Lay !).

306. VELÆA *Toluccensis*, De Cand. Prodr. vol. iv. p. 231 ? Sierra Madre.

Fruit too young to allow a satisfactory determination.

ARALIACEÆ.

307. HEDERA *arborea*, Hook. et Arn. Bot. Beech. p. 294 ! et Sw. ? Tepic (Lay !).

LORANTHACEÆ.

308. ARTHENTHOBIUM *Oxycedri*, Bieb., Torr. et Gray, Fl. N. Amer. vol. i. p. 283.—*Viscum Oxycedri*, De Cand. Prodr. vol. iv. p. 283. Sierra Madre, on Pine-trees; New Mexico (Wright, no. 1788 !).

309. VISCUM *flavescens*, Pursh, De Cand. Prodr. vol. iv. p. 280. Sierra Madre.

310. VISCUM *Reichenbachianum*, Seem., sp. nov. (TAB. LXII.); glabrum, ramis teretibus, foliis

oblongo-falcatis obtusis basi attenuatis 5–7-nerviis, spicis axillaribus confertis sessilibus articulatis, articulis vaginulatis, floribus masc. trimeris, baccis . . . . Sierra Madre (no. 2141); New Mexico (Wright).

Allied to *V. brachystachyum*, De Cand., and named in honour of my learned friend G. H. Reichenbach, fil., Professor of Botany in the University of Leipzig. Leaves from 5 to 7 inches long, ½ to 2 inches broad.

Plate LXII. Fig. 1, portion of male spike; 2, perigonium of male flower, in bud; 3, the same, open; 4, lobe of perigonium, with a stamen; 5, anthers; 6, pollen:—*all magnified.*

311. Viscum *Bolleanum*, Seem., sp. nov. (Tab. LXIII.); puberulum, demum glabrum, ramis teretibus, foliis linearibus acutis vel obtusis mucronatis sub enerviis, spicis axillaribus oppositis sessilibus paucifloris articulatis, articulis vaginulatis, floribus trimeris, baccis ovatis. Sierra Madre.

Named in honour of my friend Charles Bolle, M.D., the indefatigable explorer of the Cape de Verd and the Canary Islands. Leaves about 1 inch long, 1 line broad, but sometimes of scarcely half those dimensions.

Plate LXIII. Fig. 1, branch of male flowers; 2, spike of the same; 3, a single male flower; 4, branch of female flowers; 5, a branch, with ripe fruit; 6, spike of female flower; 7, female flower; 8 and 9, unripe fruit; 10, ripe fruit; 11 and 12, sections of seed; 13, albumen; 14, embryo:—*all*, with the exception of 1, 4, and 5, *magnified.*

312. Loranthus *calyculatus?*, De Cand. Prodr. vol. iv. p. 308. Tepic (Lay and Collie!).

313. Loranthus *Schiedeanus*, Hook. et Arn. Bot. Beech. p. 426. Between San Blas and Tepic (Lay and Collie!).

CAPRIFOLIACEÆ.

314. Lonicera *tubulosa*, Benth. Pl. Hartweg. p. 37? Sierra Madre.

As the flowers are wanting, the determination of the species is rather doubtful.

RUBIACEÆ.

Tribus I. Coffeæ.

315. Galium *Aparine*, Linn., De Cand. Prodr. vol. iv. p. 608.—*G. Mexicanum*, H.B.K. Tepic (Lay!).

316. Galium *microphyllum*, A. Gray, Pl. Wright. part i. p. 80. Sierra Madre (nos. 2062 and 2063!).

Some of my specimens agree exactly with Wright's nos. 234 and 1111, but I have others, collected in shady localities, the leaves of which are nearly an inch long. All are quite glabrous, as described by A. Gray. Corolla fimbriated.

317. Borreria *distans*, Cham. et Schlecht., De Cand. Prodr. vol. iv. p. 542.—*Spermacoce distans*, H.B.K. Tepic (Lay!).

318. Spermacoce *tenuior*, Linn., De Cand. Prodr. vol. iv. p. 552. Tepic and Talisco (Lay and Collie!).

319. Diodia *crassifolia*, Benth. Bot. Sulph. p. 108. San Blas (Barclay!).

320. Diodia *barbigera*, Hook. et Arn. Bot. Beech. p. 295. Talisco (Lay and Collie!).

321. Crusea *parviflora*, Hook. et Arn. Bot. Beech. p. 430. t. 99. C. Acapulco (Sinclair!).

322. Crusea *subalata*, Hook. et Arn. l. c. p. 431. Tepic (Barclay!).

323. Crusea *lucida*, Benth. Bot. Sulph. p. 109. Southern Mexico (Barclay!).

324. Mitracarpium *Schizangium*, De Cand.—Hook. et Arn. Bot. Beech. p. 429. t. 99. A. Tepic (Lay!).

325. Cephalanthus *occidentalis*, Linn., De Cand. Prodr. vol. iv. p. 538.—*C. Sarandi*, Cham. et Schlecht. in Linn. 1827. p. 610 et 1829, p. 147!—*C. salicifolius*, H. et Bonpl. Pl. Æquinoct. vol. ii. p. 63. t. 98. Sierra Madre (Barclay!); Tepic (Lay and Collie).

The characters insisted upon as specific marks of distinction between *C. occidentalis*, *C. Sarandi*, and *C. salicifolius*, do not hold good on being traced through a number of specimens from different localities. I can only distinguish broad and narrow-leaved, and glabrous or more or less hairy forms of one species,—*i. e. C. occidentalis*. Like *Chiococca racemosa*, this *Rubiacea* has a wide geographical range; in the Hookerian Herbarium there are specimens from—Mexico (Jurgensen, no. 160! Andrieux, no. 331! Galeotti, no. 2593!), Texas (Drummond! Lindheimer! Berlandier, nos. 2574 and 2064!), California (Hartweg, no. 1765!), Kentucky (Short!), Tabasco (Linden, no. 622!), Banks of La Plata (Tweedie!), Buenos Ayres (Fox!), Monte Video (King!), Brazil (Herb. Hook.!).

326. Chiococca *racemosa*, Jacq., De Cand. Prodr. vol. iv. p. 482. Tepic (Lay and Collie!).

Tribus II. Cinchonaceæ.

327. Hamelia *patens*, Jacq., De Cand. Prodr. vol. iv. p. 441. Tepic (Lay and Collie!).

328. Hedyotis *rubra*, A. Gray.—*Houstonia rubra*, Cav.—*Anotis Cervantesii*, De Cand.? Chihuahua (Potts!).

329. Hedyotis (§ Anotis) *bouvardioides*, Seem., sp. nov. (Tab. LXIV.); caule, foliis calyceque puberulis, ramis teretibus, foliis oppositis vel ternis elliptico-lanceolatis acuminatis, corymbis terminalibus trichotomis, calyce 4-partito cum denticulo unico interjecto, corolla infundibuliformi glabra (pallide rosea), staminibus exsertis, ovario infero, ovulis plurimis, capsula . . . . Sierra Madre.

This remarkable species does not agree with any of the subdivisions of *Anotis* proposed in Endlicher's Gen. Plant., though it does with the general character of the section. It is a half-shrubby plant from 3 to 4 feet high; the leaves are from $2\frac{1}{2}$ to 3 inches long, and (in the widest part) 9 lines broad.

Plate LXIV. Fig. 1, an entire flower; 2, ovary and style; 3, section of ovary; 4, ovules:—*all magnified.*

330. Leptopetalum *Mexicanum*, Hook. et Arn. Bot. Beech. p. 295. t. 61. Tepic (Lay and Collie!).

331. Lindenia *rivalis*, Benth. Pl. Hartweg. p. 84.—Bot. Sulph. p. 105. Mexican Coast, exact locality not specified (Barclay!).

332. Bouvardia *linearis*, H.B.K., De Cand. Prodr. vol. iv. p. 365. Sierra Madre.

333. Bouvardia *hypoleuca*, Benth., Wlprs. Ann. vol. ii. p. 778. Sierra Madre; Mexico (Bates!).

334. Bouvardia? *discolor*, Hook. et Arn.—Wlprs. Rep. vol. ii. p. 507. Sierra Madre.

A shrub from eight to ten feet high.

VALERIANEÆ.

335. Astrephia *Mexicana*, Hook. et Arn. Bot. Beech. p. 431. Sierra Madre, in shady places.

Was also found at Zinapan (Coulter, nos. 909 and 911 !), Tepic (Barclay !), Talisco (Lay and Collie !). Radical and lower leaves entire, cauline ones 1, 2, or 3-pinnatisect; fruit pubescent (even in Hooker and Arnott's original specimens).

336. Valeriana *scorpioides*, De Cand. Prodr. vol. iv. p. 635. Sierra Madre.

San Blas to Tepic (Sinclair !), Oaxaca (Galeotti, no. 2074 !), Anganguio (Hartweg, no. 300 !).

COMPOSITÆ.

(Cassiniaceæ, C. H. Schultz Bip. in Flora B. Z. 1852. p. 129.)

(*Auctore C. H. Schultz Bipontino.*)

Tribus I. Vernoniaceæ, C. H. Schultz Bip. in Linnæa, vol. xx. p. 409.

Subtribus III. Vernonieæ, Sz. Bip. l. c. p. 505.

Sectio VI. Trianthæa, DC., Sz. Bip. l. c. p. 506.

337. Vernonia *barbinervis*, Sz. Bip., nov. spec. Fruticosa, ramis teretiusculis leviter pubescentibus; foliis elliptico-oblongis, denticulatis, glabrescentibus, punctis resinosis adspersis, reticulatis, utrinque ad costam et nervorum exortum pilis articulatis dense *barbatis*, cum petiolo 4–7 lin. longo 3–5 poll. longis, 1–fere 2½ poll. latis; corymbi rotundati polycephali capitulis trifloris, pedicellis gracilibus insidentibus; involucro 3 lin. longo, pl. pedicelli duplo longiori, cylindraceo, glabrescenti, dilute brunneo-virenti squamis ovato-lanceolatis obtusis, margine sublaceris; floribus (nondum evolutis) glanduliferis, pappi radiis albis, longiuscule dentatis. Sierra Madre (Seem. col. n. 1998).

Sectio VI^{b}. Eremosis, DC. Prod. vol. v. p. 77, Sz. Bip. in Linnæa, vol. xx. p. 506.

338. Vernonia *Steetzii*, C. H. Schultz Bip., nov. spec. Fruticosa, glabrescens, ramis teretibus; foliis ovato-ellipticis, coriaceis, penninerviis, margine minutissime denticulatis, cum petiolo brevissimo, 1½ lin. longo, 3–4 poll. longis, 1¾–2¼ poll. latis, utrinque punctis resinosis obtectis; corymbi polycephali capitulis plerumque ternis ad apicem ramulorum sessilibus, unifloris; involucro dilute brunneo 2½ lin. longo turbinato squamis valde caducis, ext. minimis, reliquis ovato-lanceolatis, acutiusculis; floribus punctis glanduliferis obsitis; achæniis turbinatis, cano-hirtis; pappi nivei denticulati serie ext. breviore non valde distincta. Sierra Madre (n. 1997, specimen sinistrum).

Var. *callilepis*, Sz. Bip.; foliis duplo minoribus, paulo longius petiolatis, involucri squamis non tam caducis, purpurascentibus. An spec. distincta? (n. 1997, specimen dextrum.)

Vocavi in memoriam amici Dr. J. Steetz, Hamburgensis, Cassiniaceologi peritissimi.

Sectio VIII. Lepidaploa, § 3, DC. Prod. vol. v. p. 38.

339. Vernonia *Bolleana*, C. H. Schultz Bip., nov. spec. affinis *V. desertorum*, Mart., DC. Prod. vol. v. p. 43. n. 158, potissimum vero *V. Bahiensi*, Sz. Bip. ms. (suffruticulosa, caule foliato oligocephalo, foliis anguste linearibus, integerrimis, margine revolutis. Bahia, n. 3810. Jacobine, n. 3695: Blanchet !).—Suffruticulosa, ramis foliatis 1–4-cephalis, gracilibus, cano-arachnoideis; foliis 3–1 poll. longis, 1–1¾ lin. latis, anguste linearibus, supra glaberrimis, viridibus, nervo albo percursis,

integerrimis, margine reflexis, infra cano-arachnoideis; capitulis in axilla foliorum superiorum ortis, petiolis 1–2½ poll. longis insidentibus, speciosis, multifloris; involucro 7 lin. alto, turbinato-campanulato, imbricato, arachnoideo, squamis multiserialibus, lineari-lanceolatis, acuminato-pungentibus; floribus ½ poll. longis (purpureis), punctis glanduliferis parce obtectis; achæniis ¾ lin. longis, canohirtis; pappi nivei biserialis setis internis denticulatis 4½ lin. longis, paleis ext. multo brevioribus lineari-lanceolatis, acutis. Sierra Madre (n. 1992).

Amico Carolo Bolle speciem dicavi pulcherrimam.

340. Lagascea *mollis*, Cav., De Cand. Prodr. vol. v. p. 91. Sierra Madre.

341. Lagascea *suaveolens*, H.B.K., De Cand. Prodr. vol. v. p. 92. Sierra Madre.

342. Lagascea *angustifolia*, De Cand. Prodr. vol. v. p. 92. Sierra Madre.

343. Elephantopus *Carolinianus*, H.B.K., De Cand. Prodr. vol. v. p. 86. Tepic (Lay and Collie!).

344. Distrephus *spicatus*, Cass., De Cand. Prodr. vol. v. p. 87.—*Elephantopus spicatus*, B. Juss. Tepic (Lay and Collie!).

Tribus II. Eupatoriaceæ, Less. ex parte, Sz. Bip. in Flora B. Z. vol. xxxiii. p. 419.

Divisio II. Eupatorieæ (*achænia pentagona*), Sz. Bip. l. c. p. 420.

345. Cœlestinia *ageratoides*, H.B.K., De Cand. Prodr. vol. v. p. 108. Tepic (Lay and Collie!).

346. Ageratum (sectio i. *Euageratum*, DC. Prod. vol. v. p. 109) *microphyllum*, Sz. Bip., nov. spec. Fruticulus spithamæus, scabriusculus, decumbens, gracilis, ramis oppositis, erectis, filiformibus, inferne foliatis, superne longitudine 4 poll. efoliatis et tantum hinc inde bractea una alterave 1½–2 lin. longa cuneato-oblongo-ovata, integerrima instructis, apice capitula 2–3 gerentibus; foliis oppositis ad summum 4 lin. longis et 2 latis, triplinerviis, obtusis, utrinque pl. 2-crenatis, ovatis, in petiolum cuneatum attenuatis; capitulis subsessilibus, pauci-(5?)floris; involucri 2 lin. longi cylindracei squamis ovato-oblongis, obtusis, striatis; floribus ¼ lin. longis, punctis resinosis sparse munitis, dentibus parvis conniventibus terminatis; styli ramis elongatis, clavatis, glabrescentibus; achæniis turbinato-pentagonis, angulis scabriusculis, lineam non attingentibus, pappo coronatis e paleis 3–4 (et forsan 5) ultra lin. longis composito, inferne in scariositatem elliptico-lanceolatam expansis subintegram, superne in setam denticulatam abeuntibus. Sierra Madre (n. 2043).

347. Stevia *glandulosa*, Hook. et Arn. Bot. Beech. Voy. p. 296. Talisco (Lay and Collie!).

348. Stevia *trifida*, Lag., Sz. Bip. in Linnæa, vol. xxv. p. 268.

Var. β. *multifida*, Fl. Mex. Ic. ined.—DC. Prod. vol. v. p. 121.—Eandem habeo a Hæncke! in Mexico lect. e herb. cl. præsidis Nees ab Esenbeck, cujus Cassiniaceas nunc possideo. Sierra Madre (n. 1989).

349. Stevia *Seemannii*, Sz. Bip., nov. spec. ♃; herbacea, *subnudicaulis*; caule ultrapedali, gracili, subpubescente, ima parte foliis obsito paucis, oppositis, ovatis, triplinerviis, obtuso-rotundatis, utrinque 7–9 crenis levibus notatis, pilis brevibus utrinque hirtis, infra subpurpurascentibus, cum petiolo cuneato, laminam subæquante, ¾–1½ poll. longis, ⅞–¾ poll. latis, ceterum efoliato et tantum ultra medium foliis 2 oppositis munito parvis, 5 lin. longis, 1½ latis, ovato-oblongis, petiolatis, integris; corymbo terminato 1½ poll. diametro metiente conferto, inæquali; capitulis 5-floris, pedicello

involucro brevioribus insidentibus; involucri glabrescentis foliolis acutis; floribus punctis glanduliferis parce obsitis; achæniis angulis minute setulosis, pappo coronatis bipaleaceo et trisetoso.—Affinis *S. elatiori*, H. B. K. (Sz. Bip. in Linnæa, vol. xxv. p. 270), et *S. crenatæ*, Benth., sed caule subefoliato notisque aliis distinctissima. Sierra Madre (n. 2041).

350. Stevia *rhombifolia*, H. B. K.—Sz. Bip. in Linnæa, vol. xxv. p. 278. Planta Seemanniana corymbo magis conferto. Sierra Madre (n. 2016).

351. Stevia *lucida*, Lag. Gen. et Spec. p. 28 (an. 1816).—DC. Prod. vol. v. p. 117.

Var. *opaca*, Sz. Bip., an species propria? Omni numero cum descriptione cl. auctoris quadrat, exceptis foliis quæ opaca sunt, non lucida et glutinosa.—*S. lucida*, Lag., mihi nunc ob petiolum fere ad basin usque margine foliaceo alatum diversa videtur a *S. glutinosa*, planta columbica, multo magis fruticulosa et petiolo exalato longiore instructa. *S. lucida* potius *S. salicifoliæ*, Cav., affinis, sed foliis lato-lanceolatis crebre serratis inter alia differt. Sierra Madre (n. 2028).

352. Eupatorium (Imbricata, oppositifolia) *Bertholdii*, C. H. Schultz, Bip., nov. spec. Fruticosum, ramo pennæ corvinæ crassitie, tereti, minute pubescente, foliato, corymbo paniculato terminato trichotomo, supra decomposito; foliis oppositis, cum petiolo, 4–5 lin. longo, 4–5 poll. longis, $1\frac{3}{4}$–2 latis, ovatis acuminatis subintegris et margine tantum minutissime serrulatis, triplinerviis, supra scabris, infra reticulatis, punctis resinosis obsitis et præcipue ad nervos pubescentibus; ramis in axillis foliorum superiorum ortis brunneo-pubescenti-tomentosis, capitulis 12–13-floris, pl. 2–3 ad apicem ramulorum involucro breviorum sessilibus; involucri 3 lin. longi, cylindracei, glabrescentis, arcte imbricati squamis ovato-oblongo-linearibus, rotundatis, striatis; floribus glabrescentibus, 2 lin. longis; styli ramis elongatis, filiformi-clavatis; achæniis pentagonis, angulis subhirtis, 1 lin. circiter longis, pappo circiter 2 lin. longo sordido. Sierra Madre (n. 2011).

Dixi in honorem cl. inventoris, Dr. Berth. Seemann!

353. Eupatorium (Imbricata, alternifolia) *adenospermum*, C. H. Schultz, Bip., nov. spec. Fruticosum, ramo (caulis parte superiore) ultra pedali, filiformi, minute puberulo, brunneo-purpurascente, foliato, corymbo composito pleiocephalo terminato; foliis ovato-oblongis 2–1 poll. longis, $\frac{1}{2}$–fere 1 poll. latis, brevissime petiolatis, petiolo nempe $\frac{1}{2}$ lin. tantum longo, acutis subintegris et tantum minute serratis, triplinerviis, utrinque reticulatis, punctis resinosis adspersis, infra pallidioribus; ramulis in axilla foliorum superiorum ortis, ad summum 4–6-cephalis; pedicellis gracilibus, involucrum stramineum superne subpurpurascens subæquantibus; capitulis speciosis, 10-floris; involucri 4 lin. alti, lato-cylindracei, imbricati squamis circiter 4-serialibus, ovato-oblongo-lanceolatis, obtusis, striatis, margine sublaceris; floribus fere 3 lin. longis, glabrescentibus, styli ramis $1\frac{1}{2}$ lin. exsertis, filiformi-clavatis; achæniis $1\frac{1}{2}$ lin. longis, pentagonis, pilis glanduliferis pubescentibus, pappo stramineo fere 3 lin. longo. Sierra Madre (n. 2037).

Species distinctissima.

354. Eupatorium *monanthum*, C. H. Schultz, Bip., nov. spec.; capitulis unifloris distinctissima, et sec. principia Candolleana hanc ob notam genus efficeret proprium. Fruticosum, gracile, verosimiliter scandens, glabrescens, caulis parte superiore filiformi, paniculato-racemoso; foliis oppositis, cum petiolo $\frac{1}{2}$–$\frac{3}{4}$-pollicari $3\frac{1}{2}$–4 poll. longis, 2 poll. latis, ovato-rhombeis, acuminatis, minute denticulatis, triplinerviis; ramulis in axilla foliorum superiorum ortis, inferioribus oppositis $1\frac{1}{2}$ lin. longis, superioribus alternis $\frac{1}{2}$ poll. vix longis, pl. folio brevioribus; capitulis parvis, sessilibus, pl. 15–30 glome-

ratis, glomerulis ipsis rotundatis, pedicellatis, in ramulis alternis, racemosis; involucri cylindracei, 1 lin. longi, subimbricati squamis n. 4 tenuibus, levissime striatis, apice ciliatis, e quibus 2 longiores oblongæ, obtusæ, reliquæ duplo triplove breviores, oblongo-lanceolatæ, acutæ; flore solitario, 1 lin. longo, glabrescente, albente v. dilute flavente, styli ramis clavatis apice hemisphærico-nodosis; achæniis basi apiceque breve hirtis, cæterum glabris, pappi radiis florem æquantibus albis, uniserialibus, minute serrulatis. Sierra Madre (n. 1990).

355. Eupatorium *Schiedeanum*, Schrad.—DC. Prod. vol. v. p. 159. n. 118. Sierra Madre (n. 2018).

Obs. Vulgatissima floræ Mexicanæ planta. Habeo i. a. e reliquiis b. Hænke ab acutiss. Nees; e coll. Aschenborn! n. 262, a Mus. Reg. Berol.; e Mirador; prov. Veracruz, Linden! n. 1199, et ab amico cand. C. Sartorius, possessoris Miradoris, hospitibus botanicis semper et humanissime patentis, Jan.–Mart. 1853 abunde lectam et cum plurimis floræ ditissimæ Cassiniaceis hoc anno dono transmissam.

356. Eupatorium (Subimbricata, oppositifolia) *trinervium*, C. H. Schultz, Bip., nov. spec. ♃; herbaceum, caule solitario ultra pedali, filiformi, minute pubescente, asperulo, foliato, corymbo oligo-(pl. 4-)cephalo terminato; foliis oppositis, pl. 4–5 paribus, utrinque asperulis, partem caulis dimidiam inferiorem obsidentibus, infimis minimis, ita ut more Hieraciorum plurimorum verosimiliter caulis sit aphyllopodus, superne etiam decrescentibus ita ut intermedia sint maxima, cum petiolo 3 lin. longo, 1½ poll. longa, 5–6 lin. lata, ovato-oblongo-rhomboidea, parte inferiore integra, superiore utrinque 4–7 crenato-serrata, apice obtusiuscula, inferne acuminata *trinervia* i. e. costa nervisque lateralibus per petiolum, hinc canaliculatum, ad folii insertionem usque excurrentia et hinc stricto sensu trinervia, unde speciei nomen; caulis pars superior foliis remotis, decrescentibus, lanceolato-linearibus, 9–1½ lin. longis obsitus est. In axilla foliorum superiorum ramuli oriuntur oppositi 1½ poll. longi, 2–4 capitulis terminati; corymbus centralis pariter 4-cephalus; ramuli alterni filiformes, inferior 2-, superiores 1-cephali; capitula pedicellis 4–20 lin. longis, gracillimis, squamula una alterave notatis, vel nudis, insidentia (deflorata) hemisphærica, 20–30-flora esse videntur; involucrum 1¾ lin. altum, hemisphæricum, triserialiter subimbricatum, squamis ovato-oblongo-lanceolatis, acutiusculis, striatis; achænia ¾ lin. longa, teretiusculo-pentagona, sparse hirta, callo basilari magno instructa, pappo coronata basi in annulum concreto ¾ lin. longo, circiter 15-setoso, setis albis, denticulatis, subæquilongis. Sierra Madre.

Obs. *Eupatorio arguto*, H. B. K. (DC. Prod. vol. v. p. 162. n. 140) affinis esse videtur.

357. Eupatorium (Subimbricata, oppositifolia) *blepharilepis*, C. H. Schultz, Bip., nov. spec.; affinis *E. Karwinskiano*, DC. Prod. vol. v. p. 163. n. 142, esse videtur. Fruticosum, glaberrimum, exceptis involucri squamis ciliatis, ramis teretibus, gracilibus, dense foliatis, corymbo simplici parvo, vix ¾ poll. diametro metiente terminatis; foliis oppositis, cum petiolo 1½–2 lin. longo, 1-fere 1½ poll. longis, 5–7 lin. latis, coriaceis, supra splendentibus, infra pallidioribus, obscure triplinerviis, ovato-subrhombeo-acuminatis, apice obtusiusculis, inferne rotundatis, integris, ad medium utrinque 4–6 serratis; ramulis 2 in axilla foliorum superiorum parvorum ortis oppositis, 1–1¾ poll. longis, oligo-(3–5-)cephalis ita ut inflorescentia oriatur trichotoma, corymbo centrali 9–10-cephalo; capitulis parvis, pedicello pl. iis paullo longiore insidentibus, hemisphæricis, 30–40-floris; involucri hemisphærici, ¾ lin. alti, triserialiter subimbricati squamis ovato-oblongis, obtusis, striatis, margine præcipue intimis ciliatis; floribus achæniisque (non maturis) glabris, pappo albo denticulato. Sierra Madre (n. 2031).

358. Eupatorium *bellidifolium*, Benth. Pl. Hartweg. p. 380.—Walp. Rep. vol. ii. p. 554. Sierra Madre (n. 2042).

Obs. Eandem speciem habeo: Mexico pr. el Banco, Jan. 1839; C. Ehrenberg! n. 937 e Herb. Reg. Berol.

359. Eupatorium (Eximbricata, oppositifolia) *multiserratum*, C. H. Schultz, Bip., nov. spec. Fruticosum, ramis teretibus, glabris, brunneo-purpurascentibus, crassitie pennæ columbinæ, foliatis, corymbo trichotomo terminatis; foliis oppositis, internodiis brevioribus, cum petiolo 3–4 lin. longo, $2\frac{1}{2}$ poll. fere longis, 10–11 lin. latis, ovato-oblongis, obtusiusculis, margine minute et pulcherrime utrinque serraturis numerosis, ad 30, notatis, obscure triplinerviis, glabris exceptâ costæ parte inferiore utrinque (more *Vernoniæ barbinervis*) barbata; ramulis inferioribus, 3–7-cephalis, in axilla foliorum superiorum ortis, corymbum paniculatum efficientibus cum corymbo terminali conferto, 2 poll. diametro metiente; capitulis speciosis, 32-floris, pedicellatis, pedicellis capitula subæquantibus, in axilla bracteæ linearis 2 lin. longæ ortis et bractea simili una alterave notatis; involucri campanulati, 4 lin. longi, glabrescentis squamis biserialibus, subæquilongis, oblongo-linearibus, striatis, acutis, intimis apicem versus ciliatis; floribus achæniisque (nondum maturis) glabris, pappi albi radiis crebre denticulato-subbarbellatis, superne latioribus. Sierra Madre (n. 1987).

Divisio IV. Kuhnieæ, C. H. Schultz, Bip. in Flora B. Z. vol. xxxiii. p. 420 (achænia teretia, sub 10-gona).

360. Brickellia *corymbosa*, A. Gray in Pl. Wright. vol. i. p. 84. n. 1. Sierra Madre (n. 2008.)

Obs. Cl. A. Gray l. c. in hujus generis analysi optima hanc speciem non inter cl. Seemannii plantas enumerat, sed ejus loco var. *β. Wislizenii*, Gray, a cl. Seemann pr. Cerro de Pinal, in Mexico occid. lectam, a me vero non visam.

361. Brickellia *oliganthes*, A. Gray in Pl. Wright. vol. i. p. 84. n. 8. Sierra Madre (n. 2045).

Obs. Eandem habeo a cl. Linden! n. 1152, in prov. Mexicana Veracruz, in savannis Miradoris, Oct. 1838 lectam.—*Bulbostylis Lindenii*, Sz. Bip. in litt. ad cl. Linden, an. 1849.

362. Brickellia *dentata*, C. H. Schultz, Bip. ms.—*Clavigera dentata*, DC. Prod. vol. v. p. 128. —*Brickellia laciniata*, A. Gray, Pl. Wright. vol. i. p. 84. n. 14. et p. 87. n. 293. Sierra Madre (n. 2035).

Obs. Species hæc caule albente et foliis parvis laciniatis distinctissima, a cl. Berlandier! (teste herbario meo) etiam pr. Monterey lecta amiciss. A. Gray, Kochio Americæ Borealis, obscura fuisse videtur. Quæritur enim in Pl. Lindheimer. vol. ii. p. 218. sub n. 412 (*Brickellia cylindracea*). "Can it be *Clavigera dentata*, DC.?"

363. Brickellia *pendula*, A. Gray, Pl. Wright. vol. i. p. 85. n. 24. Sierra Madre (n. 2023).

Species mihi obscura. Planta Seemanniana ramulos habet monocephalos capitulaque speciosa.

364. Carphochæte *Grahami*, A. Gray, Pl. Wright. vol. i. p. 89. Sierra Madre (n. 2039).

Tribus III. Asteroideæ, C. H. Schultz, Bip. in Walp. Rep. vol. ii. p. 954.

Divisio III. Astereæ, Sz. Bip. l. c.

Subdivisio III. Diplopappeæ, Sz. Bip. l. c. p. 955.

365. Polyactidium *Seemannii*, C. H. Schultz, Bip., nov. spec. Herba pilis articulatis, subglanduliferis, patentibus, mollibus hispida, viridi-canescens, ut videtur annua, habitu *Polyactidii delphinifolii*, DC., elata, nam pars caulis speciminis describendi $\frac{5}{4}$ pedes alta, crassitie pennæ corvinæ, medullâ albâ farcta, facile comprimenda, foliata, ramosa, ramis elongatis in corymbum dispositis laxum

7-cephalum; foliis alternis, ad ramificationes usque 2–3 poll. longis, circumscriptione superne ⅔–1 poll. fere latis, obovato-lanceolatis, pinnatifidis, pinnis utrinque 2–3 obovato-oblongis, 1½–2 lin. latis, subintegris, lobo terminali paulo majore, pariter apice rotundato, semiamplexicaulibus et ob auriculas adnatas subdecurrentibus; ramis alternis 3–7 poll. longis in axilla foliorum paulo minorum superne incisorum ortis, ipsis foliis superne decrescentibus et ultimis lanceolatis, 3–6 lin. longis munitis, superne efoliatis; capitulis erectis, speciosis, multifloris, florentibus ultra ¾ poll. diametro metientibus; involucri hemisphærici, ultra 2 lin. alti, squamis biserialibus, subæqualibus, linearibus, acuminatissimis; receptaculo convexo, 3 lin. lato; capitulo radiato; ligulis numerosissimis, glabris, rubentibus, ultra 4 lin. longis, fœmineis, tubo 1 lin. circiter longo; floribus disci glabris, 1 lin. longis, innumeris, hermaphroditis, intimis sterilibus; achæniis ½ lin. longis, brunnescentibus, obovatis, compressis, margine carinatis et callo basilari magno munitis, glabris vel utrinque medio parce et breve pilosis, apice cupula minima subintegra decoratis pappum cingente e radiis paucis (5?) constante ⅔ lin. longis, denticulatis, tam caducissimis ut ne in capitulo florente numerus eorum rite possit determinari. Sierra Madre (n. 2026).

Obs. I. Diagnoses duarum generis specierum sunt:—

1. Polyactidium *delphinifolium*, DC. Prod. vol. v. p. 282. Adpresse hispidum, foliis pinnatipartitis, lobis linearibus, pappi biserialis, ext. cupuliformi denticulato, int. setis ad 10 composito denticulatis, caducis, florum longitudinem æquantibus. Mexico: Aschenborn! n. 467. In hortis e. g. Parisiensi colitur.

2. Polyactidium *Seemannii*. Patenti-hispidum, foliis pinnatifidis, lobis obovato-oblongis, pappi biserialis, serie ext. minimâ cupuliformi, subintegrâ, internâ e setis (5?) compositâ dentatis, caducissimis, floris ⅔ æquantibus.

Obs. II. Polyactidium *Sprengelii*, Schldl.! Linnæa, vol. x. pp. 473–475.—DC. Prod. vol. vii. p. 274; e genere excludendum et cum *Neja* jungendum, sec. specimina herb. C. Sprengel! (Erigeron dubius et resinosus, Spr.! Syst. Veg. vol. iii. p. 519.=*Neja Sprengelii*, Sz. Bip. Herb.—*Erigeron Montevidense*, Spr.! Syst. Veg. vol. iii. p. 519.—DC. Prod. vol. v. p. 294.=*Neja Montevidensis*, Sz. Bip. Herb.; cujus synon. est *Neja ciliaris*, DC. Prod. vol. v. p. 326.

Subtribus III. Euastereæ, Sz. Bip. in Walp. Rep. vol. ii. p. 952.

366. Aster *Lima*, Lindl. in DC. Prod. vol. v. p. 230. n. 29.—B. Seemann! Sierra Madre (n. 2003). Planta cl. Seemannii cum diagnosi bene convenit, est enim ♃, herbacea; caules habet 1½–2-pedales, glabros, superne scabros, filiformes, conferte foliatos, ad medium 2–5-ramosos; folia alterna, inferiora 2 poll. longa, 2 lin. lata, lineari-spathulata, integra, margine scabra; ramos monocephalos palmares ad spithamæos, foliis 1 pl. vero ½ poll. longis, 1–1½ lin. latis, linearibus, acutis, margine scaberrimis, superne decrescentibus et tantum 1½ lin. longis, utrinque et margine scabris obsitos; capitula multiflora; involucrum 3 lin. altum, campanulatum, imbricatum, squamis 4-serialibus, ovato-lanceolatis, acutis, dorso canescentibus, inferne albentibus; achænia cano-hirta pappo rufescente coronata.

Obs. I. In herbario meo tres species vel varietates huc spectantes prostant:—

1. Aster *Lindenii*, Sz. Bip. in litt. ad cl. Linden; caule ultra pedali, virgato, ramis ad 12 monocephalis; foliis valde confertis, scabris, 3–1 lin. longis, anguste linearibus, mucronatis; involucro imbricato. Mexico, Veracruz, in savannis Miradoris, Januario an. 1839: Linden, n. 1170. (Flores albi.)

2. Aster *Ehrenbergii*, Sz. Bip. in litt. ad cl. Klotsch; caule spithamæo, monocephalo vel ramoso, polycephalo, foliis non tam confertis quam *A. Lindenii*, linearibus, mucronatis, 1 poll.–2 lin. longis; involucri squamis imbricatis, quandoque apice purpurascentibus. Mexico, C. Ehrenberg! n. 791 et 947 in Herb. Reg. Berol. Huc pertinet planta cl. Seemannii.

3. Aster *purpurascens*, Sz. Bip. in litt. ad cl. Klotzsch; caulis ramosi ramis monocephalis; foliis oblongo-linearibus, 1–$\frac{1}{3}$ poll. longis, $\frac{5}{4}$–$\frac{3}{4}$ lin. latis, magis distantibus, utrinque scabro-hirtis; involucri hirti squamis pluriserialibus, subæquilongis, inferne albentibus, superne foliaceis, apice purpurascentibus. Mexico, prov. Real del Monte, C. Ehrenberg! n. 474 in Herb. Reg. Berol. Distincta specifice a præcedentibus esse videtur foliis utrinque hirtis et involucri squamis *subæquilongis*.

Obs. II. Aster *Fendleri*, A. Gray, Pl. Fendl. p. 66. n. 317; affinis esse videtur, sed involucri squamis glanduloso-scabrellis mucronatis distinctus.

Subdivisio IV. Baccharideæ, Sz. Bip. in Walp. Rep. vol. ii. p. 952.

367. Baccharis *heterophylla*, H. B. K.; var. *a*, foliis obtusis, apicem versus sinuato-dentatis, DC. Prod. vol. v. p. 411. n. 91. excl. *Baccharide heterophylla*, Spr.! Syst. Veg. vol. iii. p. 464. n. 66, diversissimâ. Omnino Cassiniaceæ herbarii C. Sprengelii, nunc partem herb. mei efficientes, leviter sunt determinatæ. Sierra Madre (n. 1996).

Obs. Var. β; foliis acutiusculis, paucidentatis, imo subintegris, DC. l. c. habeo in Mexico, pr. los Bannos de Abbot, Martio, 1837, a cl. C. Ehrenberg! n. 967, lectam, e Herb. Reg. Berol.

368. Baccharis *elegans*, H. B. K.—DC. Prod. vol. v. p. 417. n. 140. Var. β. *Seemannii*, Sz. Bip.; pubescens. Sierra Madre (n. 2015).

Obs. Ob flores centrales 1–2 capitulorum fœmineorum hermaphroditos subgenus mihi est cum pluribus aliis speciebus e. g. *B. asperifolia*, Benth.! Pl. Hartweg. p. 86; *B. hirtella*, DC. Prod. vol. v. p. 418!

369. Baccharis *ptarmicæfolia*, DC. Prod. vol. v. p. 419. n. 190. Sierra Madre (n. 2009). Forte nimis affinis *Baccharis thesioidi*, H. B. K.—DC. Prod. vol. v. p. 419. n. 152.—Schauer! in Linn. vol. xix. p. 726; sed folia magis conferta, 2 poll. longa, 1½ lin. lata.

370. Baccharis *Wrightii*, A. Gray, Pl. Wright. vol. i. p. 101. n. 307. (n. 1995.) Rarissima sec. cl. Seemann! Habitu accedit ad *B. junceam*, Desf.—DC. Prod. vol. v. p. 423. n. 183. Sierra Madre.

Tribus IV. Heliantheæ, Sz. Bip. in Webb et Berth. Hist. Nat. d. Isl. Canar. vol. iii. p. 2.—Phytogr. Canar. vol. ii. p. 242.

371. Zinnia *pumila*, A. Gray, Pl. Wright. part. ii. p. 86. Chihuahua (Potts!).

372. Trigonospermum *melampodioides*, DC. Prod. vol. v. p. 509. n. 2. Sierra Madre (n. 1983).

Obs. Eandem possideo e provincia Mexicana Oaxaca a cl. Franco lectam.

373. Franseria *ambrosioides*, Cav.—DC. Prod. vol. v. p. 524. n. 2. Sierra Madre (n. 2036).

374. Ferdinanda *oppositifolia*, C. H. Schultz, Bip., nov. spec.; foliis oppositis, 1½–3 poll. longis, 6–11 lin. latis, oblongo-lanceolatis, utrinque attenuatis, brevissime petiolatis, serrulatis, triplinerviis, supra scabris, infra parce pubescenti-hirtis. Rami qui prostant sunt dodranthales ad ultrapedales, inferne glabrescentes, capitula versus cano-hirti, filiformes, trichotome-ramosi, ramuli vero 1–2-cephali; capitula pedicellis 2–5 lin. longis insidentia, ½ poll. diametro metientia, multiflora; involucrum depresso-hemisphæricum, 1½ lin. altum, imbricatum, pubescens, squamis ovato-oblongis, obtusis, striatis; receptaculum parvum, subconicum, paleis striatis utrinque dentatis et hinc tricuspidatis munitum; flores radii lingulati n. 13 fœminei, tubo cano-pubescente vix 1 lin. longo, albente, radio ovato-oblongo 2½ lin. longo, ultra $\frac{5}{4}$ lin. lato, 6-striato, apice 3-crenato, infra minute pubescente; flores disci innumeri, flavi, $\frac{5}{4}$ lin. longi, tubulosi, 5-dentati, tubo inferne cano-hirto, antheris et styli ramis trun-

catis, exsertis; achænia parva, $\frac{3}{8}$ lin. longa, conformia, obovato-oblonga, compressiuscula, cuneata, glaberrima, minute striata, disco epigyno magno, penitus calva. Species distinctissima. Sierra Madre (n. 1986).

Obs. *Chrysophania*, Kunth in Less. Syn. p. 224 deleatur, nam *Chrysophania fastigiata*, Kunth.—DC Prod. vol. v. p. 553.—(*Anthemis fastigiata*, Willd.! Herb. n. 16,269) = *Ferdinanda angusta*, Lag.—DC. Prod. vol. v. p. 552.

375. Wirtgenia *Mexicana*, C. H. Schultz, Bip., nov. spec.; achæniis radii $\frac{5}{4}$ lin. longis, oblongo-cuneatis, sterilibus, disci fertilibus $1\frac{1}{2}$ lin. longis, obovato-cuneatis, superne $\frac{2}{3}$ lin. latis, crassis, compressiusculis, pilis brevissimis adpressis, pubescenti-hirtis, obscure griseis, submaculatis, callo basilari magno munitis utrinque in squamulam expanso ovatam, achænio 2–3-plo longiore adpressam, omnia pappo coronata sessili, cupuliformi, dentato $\frac{1}{8}$ lin. longo, $\frac{1}{4}$ lin. fere diametro metiente. Herba, ut videtur ♃, dodranthalis, gracilis, pubescenti-strigosa, caule filiformi, foliato, trichotome ramoso; foliis oppositis cum petiolo 2 lin. longo $\frac{5}{4}$ poll. longis, $\frac{3}{4}$ poll. latis, ovatis, acutis, pauci et leviter crenato-serratis, ramis 4 poll. longis, foliatis, monocephalis; capitulis pedicellis $\frac{1}{3}$–$1\frac{1}{2}$ poll. longis insidentibus, parvis, florentibus 5 lin. diametro metientibus; involucro hemisphærico, 3 lin. et ultra alto, biseriali, squamis oblongis, obtusis; paleis receptaculi glabris, lanceolatis, acutis, planiusculis; floribus glabris, radii n. 7 sterilibus, lingulatis, lingulâ ovato-oblongâ, $\frac{7}{4}$ lin. longâ, floribus disci tubulosis, 5-dentatis, styli ramis caudatis. Planta nostra certo certius est *Wirtgenia*, a speciebus Africanis pappo coroniformi, non aristato, et floribus saturate aureis inter alia diversa, et hinc mihi subgenus *Neowirtgenia*, Sz. Bip. Sierra Madre (n. 2024).

Obs. I. Wirtgenia *Texana*, Sz. Bip. ms.—*Lipochæta Texana*, Torr. Gray! Fl. N. Amer. vol. ii. p. 357. Ob flores radii fœmineos et achænia bi- radii quandoque trialata, apice emarginata et pappo coroniformi-dentato inter aristas 2 rarius 3 munita subgenus: Catomenia, Torr. Gray! l. c. Stirps Texana ob squamulam semilunari-ovatam supra callum basilarem achænio adpressam certe ad *Wirtgeniam* spectat.

Obs. II. Quid sit Coronocarpus *helianthoides*, Schum. et Thonn. Fl. Guin. p. 393, Walp. Ann. ii. p. 845, nescio.—*Coronocarpus Prieureanus* et *Gayanus*, Benth., Walp. l. c. a cl. DC. Prod. vol. v. p. 492, recte sub *Blainvillea* enumerati sunt, test. specim. Senegal. a cl. Heudelot! et Cap. Vert. a cl. Bolle! lectis. *Wirtgeniam Abyssinicam* meam etiam e Senegalia a cl. Leprieur! lectam possideo.

376. Montagnea *atriplicifolia*, C. H. Schultz, Bip. — *Verbesina atriplicifolia*, Juss. et Desf.—Spr.! Herb. et Syst. Veg. vol. iii. p. 577.—DC. Prod. vol. v. p. 613.—*Galinsogea discolor*, Spr.! Nov. Prov. p. 19.—*Clerodendron phlomoides*, Hort. Ital.! sec. specimen cl. Balbis! in Herb. Spr.! = *Montagnea arborescens*, DC. Prod. vol. v. p. 565. (Flores albi, *Seemann!*) Sierra Madre (n. 2012).

Obs. Habeo hanc speciem: Mexico, ad decliv. occid. Cordill. Quehilaqua: Berlandier! n. 1006; S. Cajetano, pr. Grande, Aug. 1837 (arbor 12-pedalis: C. Ehrenberg! n. 829[a]), et pr. Mexico, specimen fructigerum: C. Ehrenberg! n. 829[b].

377. Montagnea *ensifolia*, C. H. Schultz, Bip., spec. nova distinctissima, generis nostri paradoxa. Suffruticulosa; specimen herbarii mancum, sesquipedale, caule pennæ corvinæ crassitie, striatum, pubescenti-scabriusculum, foliatum, trichotome ramoso-paniculatum; foliis oppositis, 5–6 poll. longis, $\frac{1}{2}$ poll. latis, brevissime petiolatis, connatis, ensiformibus, margine subrevolutis, primâ fronte integris, revera autem minutissime et distanter serrulatis, supra scabris, infra triplinerviis, reticulatis, pubescenti-scabriusculis; ramis 3–6 poll. longis, supremis alternis, monocephalis, infimis 3–5-cephalis, ramulis oppositis bracteola foliacea una alterave, 3–9 lin. longa, oblongo-lanceolata notatis; capitulis erectis, radiatis; involucri 3–4 lin. longi, hemisphærici, grisei squamis imbricatis, scabriusculis,

ovato-oblongis, obtusis; achæniis glabris, oblongo-cuneatis, compresso-trigonis, emarginatis, calvis. Sierra Madre (n. 2007).

378. VIGUIERIA (*Harpalizia*, DC. Prod. vol. v. p. 584.—Gardner in Hook. Lond. Journ. Bot. vol. vii. p. 402.) *Seemannii*, C. H. Schultz, Bip., nov. spec. Suffruticulus scaberrimus; ramis teretibus, 1 lin. diametro met., apice 3–5-cephalis; foliis oppositis, 2–3½ poll. longis, 7–9 lin. latis, superne decrescentibus, oblongo-lanceolatis, utrinque attenuatis, subsessilibus, margine subrevoluto-serrulatis, supra scaberrimis, infra triplinerviis, reticulatis, pallidioribus, pubescenti-hirtis; capitulis brevissime pedicellatis, subglomeratis, multifloris; involucri ½ poll. alti, hemisphærici, pluriserialis, imbricati squamis lineari-lanceolatis, pungentibus; floribus flavis; achæniis villoso-hirtis, radii et disci pappo coroniformi multipaleaceo-setoso munitis et disci insuper ex angulis biaristato. Sierra Madre (n. 2005).

379. TITHONIA *calva*, C. H. Schultz, Bip., nov. spec.; ob achænia glabra, calva, subquadrigona, striatula (non penitus matura ¾–1½ lin. longa) = Subgenus *Mirasolia*, Sz. Bip. Habitus *Tithoniæ*; herbæ pars herbarii nostri dodranthalis, caule foliato, superne ramoso, crassitie pennæ anserinæ, molliter et dense albenti-villoso, foliis confertis alternis cum petiolo alato-cuneato, basi utrinque in auriculas rotundatas expanso, 7–8 poll. longis, 3 poll. et ultra latis, ovatis, acuminatis, serratis, triplinerviis, mollibus, supra hirtis, infra pallidis et hirto-villosis; capitulis, pedunculis fistulose incrassatis, pilis albentibus mollibus villosis insidentibus, speciosissimis, ultra 2 poll. diametro metientibus; involucri depresso-hemisphærici, villosi, ultra 1 poll. lati, 5 lin. alti, biserialis squamis ext. lanceolatis, acuminatis, int. oblongis, acutis; receptaculi paleis 4 lin. longis, multistriatis, achænia amplectentibus, apice abrupte breve spinosis; *floribus* flavis, *radii* lingulatis n. 13 speciosissimis cum tubo brevi, ½ lin. tantum longo, pollicaribus et ultra 3 lin. latis, multistriatis, neutris; *disci* innumeris, ultra 2 lin. longis, tubulosis, 5-dentatis, hermaphroditis, genitalibus exsertis, styli ramis cono brevi superatis. "Mirasol" Mexicanorum sec. cl. Seemann. Sierra Madre (n. 2045).

380. ZEXMENIA *Seemannii*, A. Gray! in Plant. Wright. vol. i. p. 114. Species est elegantissima. Sierra Madre (n. 2019).

381. ZEXMENIA *Grayii*, C. H. Schultz, Bip., nov. spec., in honorem amicissimi et acutissimi A. Gray dicta. Suffruticulosum videtur specimen herbarii incompletum, præcipue quoad capitula mancum et non sine hæsitatione generi nostro adscriptum, ¾-pedale, caule filiformi, tereti, pubescente, foliato, superne trichotome ramoso; foliis oppositis cum petiolo, 2–3 lin. longo, 2½–3½ poll. longis, 7–10 lin. latis, superne decrescentibus, ovato-lanceolatis, utrinque attenuatis, acuminatis, penninerviis, superne asperis, infra pubescentibus, reticulatis; ramulis inferioribus 1½ poll. longis, tricephalis, superioribus monocephalis; capitulis pedicellos subæquantibus, 3–4 lin. longis, ovato-oblongis; involucri 3 lin. alti, hemisphærico-cylindracei, imbricati squamis lineari-lanceolatis acutis v. acuminatis; receptaculo paleaceo; floribus flavis, radialibus lingulatis, 2 lin. lougis, ovatis, fœmineis, disci tubulosis hermaphroditis, achæniis pilosis biaristatis.—Affinis videtur *Zexmeniæ serratæ*, Lal. Lex. Nov. Veg. Mex. p. 13, sed nostræ inter alia folia non sunt infra aspera nec foliola involucri ovata apice revoluta. Sierra Madre (n. 2004).

Obs. Genus *Zexmeniam*, duce A. Gray, Pl. Wright. vol. i. pp. 111–114, in herbario meo disposui.
ZEXMENIA *helianthoides*, A. Gray, l. c. p. 113. Mexico: Hænke!
ZEXMENIA *crocea*, A. Gray, l. c. p. 114, pedunculis fistulosis distinctissima. Mexico: Hænke!
ZEXMENIA *ceanothifolia*, Sz. Bip.—*Verbesina ceanothifolia*, Willd.! Herb. n. 16,390 et Sp. Pl. vol. iii.

p. 2225.—DC. Prod. vol. v. p. 613.—*Lipochæta umbellata*, DC. Prod. vol. v. p. 610. Hanc speciem e regno Mexicano pariter habeo e reliquiis b. Hænkei e herb. cl. Neesii et aliam a cl. Aschenborn! Pl. Mex. n. 661 (*Lipochætam umbellatam*, Schauer! in Linnæa, vol. xix. p. 729) in Herb. Reg. Berol. vidi forsan specifice diversam.

Zexmenia (*Lipochæta monocephala*, DC. Prod. vol. v. p. 610) *monocephala*, Sz. Bip. Mexico, Veracruz, Mirador. Jan.–Mart. 1853: C. Sartorius!

Zexmenia (*Lipochæta strigosa*, DC. Prod. vol. v. p. 610) *strigosa*, Sz. Bip. Mexico: Hænke!

Zexmenia *imbricata*, C. H. Schultz, Bip., nov. spec. Suffruticulosa, canescens, caule glabrescente, foliis oppositis, scabris, cum petiolo 8 lin. longo, 4 poll. longis, ultra 2 latis, subcordato-triangulari-ovatis, acutis, trinerviis, irregulariter dentatis; capitulis in axilla foliorum superiorum orientibus, pedicellum subæquantibus; involucri turbinato-hemisphærici, 3 lin. alti, 5-serialiter imbricati, foliolis scabris, ovato-linearibus, obtusis; achæniis obovatis, triquetris v. compressis alatis, alis in cornua totidem acuta abeuntibus, inter quæ paleæ 2 minutæ observantur. Certe hujus generis. Mexico: b. Hænke!

Zexmenia (*Lipochæta lantanifolia*, Schauer! in Linnæa, vol. xix. p. 729) *lantanifolia*, Sz. Bip. Mexico, circa Zimapan: Aschenborn! n. 210.

Zexmenia (*Lasianthæa Lindenii*, Sz. Bip. in litt. ad cl. Linden) *Lindenii*, C. H. Schultz, Bip. Mexico, Veracruz, Mirador, alt. 3000′, Oct. 1838: Linden! n. 1197; foliis alternis ab omnibus differt, 3½ poll. longis, ¾–1 poll. latis, elliptico-lanceolatis, utrinque attenuatis, petiolatis, serratis, penninerviis, supra asperis, infra tomentosis, corymbo polycephalo (floribus flavis: Linden).

Zexmeniam (*Lipochætam fasciculatam*, DC. Prod. vol. v. p. 610) *fasciculatam* non habeo, sed adhuc aliam novam speciem Mexicanam a cl. Aschenborn! lectam.

382. Sanvitalia *ocymoides*, De Cand. Prodr. vol. v. p. 628. Chihuahua (Potts!).

383. Verbesina *Seemannii*, C. H. Schultz, Bip., nov. spec. Suffruticulosa, ramo speciminis mei 8-pollicari, filiformi, glabro, foliato, corymbo composito, 3 poll. diametro metiente terminato; foliis alternis, oblongo-lanceolatis, cum petiolo 3 lin. longo, 4 poll. longis, 1 poll. latis, utrinque attenuatis, serratis, acuminatis, penninerviis, supra asperis, infra glabrescentibus; ramulis gracilibus ad apicem rami confertis, subumbellatis, 1–2 poll. longis, efoliatis, 3–5-cephalis; capitulo centrali subsessili, lateralibus pedicellis alternis vel subumbellatis insidentibus, filiformibus, capitulis 2–3-plo longioribus; involucri 1 lin. alti, biserialis squamis ovato-oblongis, obtusis; floribus radii lingulatis fœmineis 3–4 lin. longis, ¾ latis speciosis, disci tubulosis hermaphroditis; receptaculi paleis apice truncatis, denticulo inconspicuo subreflexo coronatis; achæniis vix 1 lin. longis, obovatis, compressis, basin versus attenuatis, substipitatis, utrinque parce pubescentibus, margine carinatis, non vero alatis, apice aristis 2 ex angulis ortis, ultra ½ lin. longis munitis. Affinis *Verbesinæ persicifoliæ*, DC. Prod. vol. v. p. 614, cujus folia vero magis integra, glabra, et achænia utrinque late alata. Sierra Madre (n. 2027).

Galinsogeopsis, C. H. Schultz, Bip., nov. Heleniearum genus. *Gen. Char.* Capitulum multiflorum, heterogamum radiatum, radiis n. 8 fœmineis, albentibus v. pallide rubentibus, involucro duplo longioribus, obovato-oblongis, apice dentibus 3 breve ovatis rotundatis munitis, styli ramis exsertis elongato-cylindraceis; floribus disci numerosis flavis, 1 lin. longis, hermaphroditis, tubulosis, 4–5-dentatis, tubo proprio uti et florum lingulatorum pilis glanduliferis obsito, campanulâ vero glabrâ; genitalibus subinclusis, antheris ecaudatis, corona ovato-oblonga rotundata superatis, styli ramis cylindraceo-appendiculatis, asperulis. Involucrum hemisphæricum, 1 lin. altum, pubescens squamis numerosis, subæqualibus, linearibus, acuminatis. Receptaculum plano-convexum, ½ lin. latum, nudum. Achænia ½ lin. longa, ovata, compressa, atra, utrinque paullo pilosa, margine, basi incrassato, calloso, albo cincta, ciliata, ciliis sursum spectantibus, simplicibus, pappo coronato cupuliformi, cupula brevi ciliata,

ciliis numerosis, simplicibus et sæpius aristâ 1, rarius 2, ex angulis ortâ denticulatâ, cupulâ ipsa pl. triplo longiore, achænio vero triplo breviore.

384. Galinsogeopsis *spilanthoides*, C. H. Schultz, Bip., nova et unica generis species. Herba annua, pedalis et altior, habitu *Galinsogeæ*, sed charactere potius *Spilanthoideis* affinis, subglabrescens, minute præcipue superne pubescens, caule solitario $\frac{1}{3}$–1 fere lin. diametro metiente, terete, foliato et trichotome ramoso; foliis oppositis, cum petiolo gracili $\frac{1}{2}$–$1\frac{1}{2}$ poll. longo, $1\frac{1}{2}$–fere 3 poll. longis, $\frac{1}{2}$–1 poll. latis, ovato-triangulari-rhomboideis, crenato-serratis, obtusiusculis, trinerviis, glabrescentibus, tenuibus; ramis pl. jam infra caulis medium orientibus oppositis, superioribus quandoque alternis, 4–5 poll. longis, gracilibus, foliatis; capitulis pisi magnitudinem non attingentibus, hemisphæricis, $1\frac{1}{2}$ lin. altis, pedicellis gracilibus pl. 1–$1\frac{1}{2}$ poll. longis insidentibus ramulos terminantibus aut in axilla trichotomiæ (1–3) orientibus. Sierra Madre (n. 1981 et 1982).

385. Bidens *pilosa*, Linn.—*Bidens pilosa, β discoidea*, Sz. Bip. in Webb et Berth. Canar. vol. iii. 3. p. 242. Sierra Madre (n. 2047).

Spontaneam habeo in herbario meo hanc formam. Surinam: Focke! n. 613; ad vias pr. plant. Quarta Maio, 1844; Kegel! in agris pr. Paramaraibo, Apr. 1846; Kappler! pl. Surinam. ed. Hohenacker, n. 1868; Peru: Cuming! n. 1041; Portorico in pratis: Bertero! n. 797; Madera, Apr. 1851: A. Schmidt!

386. Bidens (sectio iii. *Discopoda*) *Seemannii*, C. H. Schultz, Bip., nov. spec. Herba ♃, glabra, pedalis, caule $\frac{2}{3}$ lin. diametro metiente tereti, conferte foliato, trichotome ramoso; foliis oppositis, 1–2 pinnatisectis, segmentis $\frac{1}{2}$–$1\frac{1}{2}$ poll. longis, $\frac{1}{5}$ lin. latis, angustissime linearibus, integris, acutis; ramo inferiore 5 poll. longo, foliato, monocephalo, terminalibus, filiformibus, 3–$4\frac{1}{2}$ poll. longis, efoliatis; capitulo specioso, multifloro; involucro $4\frac{1}{2}$ lin. alto, campanulato, biseriali, squamis ext. crassis, striatis ultra 2 lin. longis, 1 latis, lineari-lanceolatis acutis, int. oblongo-lanceolatis obtusiusculis, tenuibus, 4 lin. longis, circiter 1 lin. latis; floribus sec. amiciss. Seemann purpureis; achæniis non penitus maturis ultra 2 lin. longis, lineari-tetragonis, basi in callum orbiculari-reniformem conspicuum abeuntibus, aristis n. 6 coronatis, rectis, 5–6 lin. longis, crassis, teretiusculo-linearibus, retrorsum denticulato-aristulatis. Sierra Madre (n. 2014).

Species nostra aristis n. 6 foliisque distinctissima charactere cum *Bidente purpurea*, DC. Prod. vol. v. p. 604 convenit.

387. Bidens (an sectio iii. *Discopoda?*) *linearifolia*, C. H. Schultz, Bip., nov. spec. Herba (♃?) caule vix 1 lin. diametro metiente, gracili, subtetragono, striato, foliato, apice trichotome ramoso; foliis oppositis, 3–$3\frac{1}{2}$ poll. longis, 1–$1\frac{1}{2}$ lin. latis, superne decrescentibus, lato-linearibus, acutis, basin versus attenuatis, sessilibus, subconnatis, uninerviis, margine scaberrimis; ramis paucis, oppositis, 2–3 poll. longis, efoliatis; involucri 3–4 lin. longi, campanulati, cylindracei squamis lineari-lanceolatis; floribus purpureis; achæniis linearibus, 3-aristatis. Sierra Madre (n. 2022).

Obs. I. Species hæc affinis est *Bidenti Sartorii*, Sz. Bip. ms., cujus folia etiam linearia et integerrima sunt, sed $1\frac{1}{2}$ poll. longa, vix $\frac{1}{2}$ lin. lata, capitula majora et achænia 6-aristata. Hab. in prov. Mexicana Veracruz, pr. Mirador: C. Sartorius.

Obs. II. Cosmos, H.B.K. (DC. Prod. vol. v. p. 606) se habet ad *Bidentem*, sicut *Barkhausia* ad *Crepidem*, et me judice non separandus, quare in herbario *Cosmi* species cum *Bidente* junxi.

Cosmos bipinnatus, *Cav.*	=	Bidens formosa, *Sz. Bip.*
„ tenuifolius, *Lindl.*	=	„ Lindleii, *Sz. Bip.*
„ parviflorus, *H.B.K.*	=	„ Humboldtii, *Sz. Bip.*

Cosmos	tenellus, *H.B.K.*	=	Bidens	Bonplandii, *Sz. Bip.*
„	caudatus, *H.B.K.*	=	„	caudata, *Sz. Bip.*
„	sulphureus, *Cav.*	=	„	sulphurea, *Sz. Bip.*
„	chrysanthemoides, *H.B.K.*	=	„	Kunthii, *Sz. Bip.*
„	pilosus, *H.B.K.*	=	„	rosea, *Sz. Bip.*
„	crithmifolius, *H.B.K.*	=	„	Valladolidensis, *Sz. Bip.*
„	scabiosoides, *H.B.K.*	=	„	scabiosoides, *Sz. Bip.*
„	reptans, *Benth.*	=	„	reptans, *Sz. Bip.*
„	diversifolius, *Fr. Otto.*	=	„	diversifolia, *Sz. Bip.*
„	carvifolius, *Benth.*	=	„	carvifolia, *Sz. Bip.*

Obs. III. Delucia *ostruthioides*, DC. Prod. vol. v. p. 633, sec. specimina ab amico C. Sartorius in prædio ejus "Mirador" dicto, lecta = *Bidens ostruthioides*, Sz. Bip. ms.

388. Broteroa *trinervata*, Pers., De Cand. Prodr. vol. v. p. 636. Chihuahua (Potts!).

389. Dysodia *appendiculata*, Lag.—DC. Prod. vol. v. p. 640. n. 5. Sierra Madre (n. 1991).

390. Tagetes *patula*, Lin.—DC. Prod. vol. v. p. 643. n. 8. Sierra Madre (n. 2044).

Obs. Spontaneam habeo stirpem nostram e prov. Mex. Veracruz, pr. Mirador, alt. 3000′, Dec. 1838: Linden! n. 1175; Mexico, pr. S. Piedro e S. Paulo: C. Ehrenberg! n. 370; Mexico: De Berghes! e Herb. ill. Neesii nomine *Tagetis tenuifoliæ*.

391. Porophyllum (sectio i. *Euporophyllum*) *Lindenii*, C. H. Schultz, Bip., in litt. ad cl. Linden. Suffruticulosum, glabrum, ramis herbarii nostri pedalibus, ¾ lin. latis, teretibus, striatis, brunneo-rufescentibus, conferte foliatis, superne ramulosis; foliis oppositis, cum petiolo, ¼ poll. longo, 1½ poll. longis, 10 lin. latis, superne decrescentibus, obovato-cuneatis, integris vel ad medium leviter sinuatis, infra sinum glandulâ semilunari notatis, coriaceis, subtriplinerviis, reticulatis; ramulis 1½–4½ poll. longis foliatis; capitulis cylindraceis, ½ poll. longis, 10-floris, ad apicem ramulorum 2–4 pedicellis ipsis brevioribus insidentibus, vel subsessilibus; involucri 5 lin. longi foliolis n. 5 uniserialibus, subæqualibus, oblongo-obverse lanceolatis, obtusis glandulis paucis linearibus notatis; floris ultra 3 lin. longi, subpubescentis tubo gracili apice dentibus 5 lanceolatis munito; genitalibus exsertis; achænio 4 lin. longo, lineari-cylindraceo, compressiusculo, utrinque attenuato, breve rostrato, striato, brunneo; pappi persistentis 3 lin. longi uniserialis radiis ad 30 obscuris, denticulatis. Sierra Madre (n. 2020).

392. Porophyllum (sectio ii. *Hunteria*) *Seemannii*, C. H. Schultz, Bip., nov. spec. Suffruticulosum, glabrum, ramo herbarii nostri pedali, tereti, filiformi, foliato, paniculato-ramoso; foliis alternis, obverse lanceolatis, cum petiolo 3 lin. longo, ¾–1½ poll. longis, 2–3 lin. latis, obtusis, margine utrinque 3–4 leviter sinuatis, glandulâ semilunari sub quovis sinu positâ; ramulis in axilla foliorum superiorum orientibus, 2–2½ poll. longis, filiformibus, capitulum versus paulisper cuneato-inflatis, 1–2-cephalis, foliis paucis munitis 8–3 lin. longis, 1–⅓ lin. latis, obverse lanceolato-linearibus, plerisque oppositis, quod paradoxum, quia folia caulina (ramea) sint alterna, superioribus efoliatis; capitulis ovato-oblongis, multifloris; involucri 3 lin. et ultra longi 5-phylli foliolis oblongo-linearibus, basi gibbis, pruinosis et glandulis linearibus 3–4 uniseriatis decoratis; floribus 2 lin. longis, glabrescentibus; achæniis 2 lin. circiter longis, lineari-cylindraceis, compressiusculis, utrinque attenuatis et hinc breve stipitatis et breve rostratis, brunneis, striatis, breve hirtis, pappum subæquantibus sordide albentem, radiis compositum ad 4, longe denticulatis subbarbellatis. Sierra Madre (n. 2013).

393. Pectis *Seemannii*, C. H. Schultz, Bip., nov. spec. Herba annua, scabriuscula pl. spithamæa, multi-7-caulis, caulibus filiformibus, gracilibus, vix ¼ lin. crassis, teretibus, inferne purpurascentibus et foliis remotis oppositis, anguste linearibus 4–6 lin. longis, ¼ lin. latis, obtusis, integris, ad basin utrinque ciliatis obsitis, supra v. infra medium speciminum obesorum trichotome, macrorum v. superne dichotome ramosis; ramis pl. monocephalis, 1–2½ poll. longis, foliolis 2–5 alternis, 1–2 lin. longis, anguste linearibus munitis; capitulis florentibus 4 lin. diametro metientibus; involucri ⅝ lin. longi foliolis 8–10 uniserialibus, oblongo-linearibus, obtusis, pubescentibus, cano-virentibus; floribus aureis, radii n. 8 circiter, lingulatis fœmineis, lingula involucro duplo longiore, oblonga, 5-striata, disci tubulosis, 5-dentatis, hermaphroditis, minute puberulis; achæniis ½ lin. longis, ovato-oblongis, compressiusculis, multistriatis, sparse puberulis, callo basilari magno munitis et pappo coronatis e paleis composito achænio longioribus n. 5 persistentibus basi in scariositatem lanceolatam denticulatam expansis, superne aristatis.—Affinis *Pectidi capillari*, DC. Prod. vol. v. p. 99, et *P. tenellæ*, DC. l. c., sed inter alia pappi paleis inferne late scariosis differt. Sierra Madre (n. 2038).

Obs. Eupectideas, DC. Prod. vol. v. p. 98, cum b. Cassini ad *Tagetineas* refero, omniaque genera l. c. prolata, nempe: *Pectidopsidem*, DC., *Pectidium*, Less., et *Lorenteam*, Less., annuentibus cl. Swarz, Kunth et A. Gray cum *Pectide* junxi.

Lorentea cryptocephala, *DC. Prod. v. 5. p.* 101		= Pectis cryptocephala, *Sz. Bip.*
„	Hænkeana, *DC.! l. c. p.* 102	= „	Hænkeana, *Sz. Bip.*
„	humifusa, *Less., DC. l. c.*	= „	humifusa, *Swarz.*
„	multifloseulosa, *DC.! l. c.*	= „	multifloseulosa, *Sz. Bip.*
„	sessiliflora, *Less., DC. l. c.*	= „	sessiliflora, *Sz. Bip.*
„	auricularis, *DC.! l. c.*	= „	auricularis, *Sz. Bip.*
„	canescens, *DC. l. c.*	= „	canescens, *H.B.K.*
„	satureioides, *DC. l. c.*	= „	satureioides, *Sz. Bip.*
„	tenuifolia, *DC. l. c.*	= „	tenuifolia, *Sz. Bip.*
„	oligocephala, *Gardn. Walp. Rep. v.* 6. *p.* 104	= „	oligocephala, *Sz. Bip.*
„	affinis, *Gardn. Walp. l. c.*	= „	affinis, *Sz. Bip.*
„	ramosissima, *Gardn. Walp. l. c.*	= „	ramosissima, *Sz. Bip.*
„	polycephala, *Gardn.! Walp. l. c. p.* 105	= „	polycephala, *Sz. Bip.*
„	decumbens, *Gardn. Walp. l. c.*	= „	decumbens, *Sz. Bip.*
„	congesta, *Gardn. Walp. l. c.*	= „	congesta, *Sz. Bip.*
„	subsquarrosa, *Hk. fil., Walp. Ann. v.* 1. *p.* 392	= „	subsquarrosa, *Sz. Bip.*
„	brevipedunculata, *Gardn.! Walp. l. c.*	= „	brevipedunculata, *Sz. Bip.*

Tribus V. Gnaphalieæ, Less.—DC.—Sz. Bip. in Webb et Berth. Canar. iii. 2. p. 304.

394. Gnaphalium *polycephalum*, Mich.—DC. Prod. vol. vi. p. 227. n. 35.—Torr. Gray! Fl. N. Amer. vol. ii. p. 427. Sierra Madre (n. 1993).

Speciei polymorphæ specimen foliis anguste linearibus, involucri squamis in brunneo-carneum vergentibus.

395. Gnaphalium *stramineum*, H.B.K.—DC. Prod. vol. vi. p. 230. n. 55. Chihuahua (J. Potts!).

396. Gnaphalium *Seemannii*, C. H. Schultz, Bip., nov. spec. Suffruticulus elegantissimus. Specimen herbarii nostri dodranthale, teres, ⅝ lin. diametro metiens, parte inferiore, longitudine 4 poll. decumbens, tunc adscendens et longitudine 2 poll., foliis anni præterlapsi subdestructis reflexis con-

fertissime obsitum, superne longitudine 2 poll., foliis annotinis lineâ spirali dispositis pariter ad inflorescentiam usque confertis munitum plerisque reflexis $1\frac{3}{4}$ poll. longis, 2 lin. et ultra latis, superne decrescentibus, lanceolato-linearibus, utrinque attenuatis, acutis, integerrimis, margine revolutis, supra glaberrimis, infra tomento niveo dense pannoso cum ramis et pedunculis obsitis; capitulis pedicellis paulo longioribus insidentibus vel subsessilibus, multifloris in corymbum compositum confertum, $\frac{5}{4}$ lin. diametro metientem, dispositis; involucri 3 lin. alti, hemisphærici, imbricati squamis externis hemisphærico-ovatis, margine late scariosis, albentibus, basi maculâ brunneâ insignitis, intimis oblongo-linearibus in appendicem oblongo-cuneatam rotundatam lacteam radiantem expansis, intus ad exortum radii lactei maculâ brunneâ notatis; receptaculo $\frac{3}{4}$ lin. lato, plano, nudo; floribus purpureis, involucro brevioribus, $\frac{5}{4}$ lin. longis, exterioribus numerosis, fœmineis, filiformibus, superne purpurascentibus, intimis n. 16 tubuloso-campanulatis, 5-dentatis, purpureis, hermaphroditis, intimis forsan sterilibus; genitalibus inclusis, antherarum caudatarum coronis ovali-lanceolatis, obtusis, styli ramis cylindraceis inclusis; achæniis parvis, ovato-oblongis, compressiusculis, papillis crystallinis brevissime hirtis, omnibus pappo albente, uniseriali coronatis; radiis caducis, denticulatis florum fœmineorum filiformibus apice non incrassatis, florum hermaphroditorum vero apice clavato-incrassatis, antennæformibus. Sierra Madre (n. 1994).

Obs. *Gnaphalium Seemannii*, cum affine *Gnaphalio rhodantho*,=*Gnaphalii* subgenus *Rhodognaphalium*, Sz. Bip. Pappus florum hermaphroditorum superne incrassatus, fœmineorum filiformis, flores purpurei, involucrum radians. Suffruticuli Mexicani, alpigeni, dichotomi, foliis lineari-lanceolatis, infra tomentosis, confertis, annorum præterlapsorum persistentibus, pendentibus.

A. Eurhodognaphalium, Sz. Bip. Pappi florum hermaphroditorum radii apice subclavati. Huc *Gnaphalium rhodanthum*, Sz. Bip. ms. Suffruticulosum, caule graciliore, foliis linearibus non tam confertis quam *Gnaphalii Seemannii*, supra pubescentibus, infra tomentosis; involucri squamis externis ovato-lanceolatis, brunneis, internis breve radiantibus apice lacteis. Mexico, prov. Chiapas, in pinetis Jitotole, alt. 6900′. Feb. 1840: Linden! n. 437; pr. el Sumate, alt. 11,000′. C. Ehrenberg! n. 332.

B. Metalasiopsis, Sz. Bip. Pappi florum hermaphroditorum radii apice clavati, antennæformes. Huc *Gnaphalium Seemannii*.

Tribus VI. Senecioneæ, C. H. Schultz, Bip., Herb.—*Senecioneæ*, DC. Prod. vol. vi. p. 292, excl. *Neurolæna*, R. Br., cum *Heliantheis* jungendâ.

397. Cacalia *pachyphylla*, C. H. Schultz, Bip., nov. spec. Herbacea, glabra, foliis radicalibus maximis petiolatis, petiolo 13 poll. longo, $\frac{5}{4}$ lin. lato, striato-sulcato, laminâ folii coriaceâ a petioli insertione $4\frac{1}{2}$ poll. longa, 9 poll. lata, reniformi, cordato-rotundatâ, margine subintegra et tantum denticulis paucis callosis notatis et prope basin quandoque in lobulum oblongo-ovatum $\frac{1}{2}$ poll. longum $\frac{1}{4}$ poll. latum fissâ, nervo medio sinuato, a basi dichotome in nervos plures laterales conspicuos pariter sinuatos diviso, apicem folii non attingente et cum reliquis nervulis in rete confluente elegantissimum; parte caulis herbarii nostri bipedali, junceâ, 1 lin. circiter crassâ, terete, sulcato-striatâ, medullâ farctâ albâ, ad medium foliolo munita, 7 lin. longa, lineari-lanceolata, superne paucidenticulata. Superne caulis in axilla foliolorum similium, sed minorum, subintegrorum, 5–3 lin. longorum dichotome in ramos abit paucos (3) 5–2 poll. longos, pl. 2-cephalos, ita ut inflorescentia paniculata oriatur subcorymbosa, 4 poll. diametro metiens; capitulis multifloris, semper erectis, 7 lin. altis, ovato-hemisphæricis, pedicellis insidentibus 11–22 lin. longis, bracteolis 2–4 munitis linearibus, 1–$2\frac{1}{2}$ lin. longis; involucri hemisphærici 4–$4\frac{1}{2}$ lin. alti squamis n. 13 lineari-lanceolatis, coriaceis, inferne squamula una alterave breviore anguste lineari auctis; floribus omnibus tubulosis, ultra 4 lin. longis (albentibus?),

tubo proprio 3 lin. longo, coriaceo, inferne inflato, superne in dentes 5 anguste lineares, $\frac{5}{4}$ lin. longos, obtusos expanso; antheris ecaudatis, styli basi bulbosi ramis elongatis, cono superatis; achæniis non penitus maturis $1\frac{1}{2}$ lin. longis, glabris, cylindraceis, callo basilari magno instructis et apice in callum apicalem periphericum expansis cui insidet pappus albus, copiosus, 4 lin. longus, radiis compositus, denticulatis, albentibus, singulis caducis.—Affinis *Cacaliæ cordifoliæ*, H.B.K. (DC. Prod. vol. vi. p. 327. n. 6), sed inter alia differt foliis maximis reniformibus, petiolo pedali sustentatis, caule subaphyllo, capitulis semper erectis. Sierra Madre (n. 1999).

398. Senecio *Toluccanus*, DC. Prod. vol. vi. p. 428. n. 527? Var. *modesta*, Sz. Bip., an spec. propria? Sierra Madre (n. 2006).

Obs. Plantæ nostræ caulis bracteis foliaceis vaginantibus munitus, folia radicalia 5–6 poll. longa, $\frac{3}{4}$ poll. lata, coriacea, crenato-dentata, pedicelli bracteolati quare eam cum? *Senecioni toluccano*, DC. adscripsi. Eandem plantam foliis 4–5 poll. longis, ultra 1 poll. latis, in Herb. Reg. Berol. vidi e Mexico: ad pedem m. Oyanul, Dec. n. 856, et ad pedem. m. Joerl, Junio 1839, n. 1284: C. Ehrenberg! et Real del Monte: C. Ehrenberg! n. 382 ex parte (= *Senecio modestus*, Sz. Bip. in litt. ad cl. Klotsch) altera ex parte = *Cacalia vaginans*, Sz. Bip. ms.

399. Senecio *salignus*, DC. Prod. vol. vi. p. 430. n. 540. Sec. cl. B. Seemann color flavus e planta paratur nostra. Sierra Madre (n. 1985).

Obs. Fruticem nostrum floræ Mexicanæ vulgatissimum æque ac elegantissimum in herbario meo habeo a viris cel. Berlandier, a Karwinski, Sommerschu, Linden, C. Ehrenberg et Aschenborn lectum et in Herb. Willd.! n. 15,750 nomine *Senecionis salicifolii* vidi a cl. Humboldt et Bonpland lectum (= *Cineraria salicifolia*, H.B.K.).

400. Senecio (*Angulifolii*) *Seemannii*, C. H. Schultz, Bip., nov. spec. Suffruticulosus, glabrescens, caule speciminis nostri sesquipedali, $\frac{5}{4}$ lin. lato, foliato, angulato, striis parvis linearibus picto, corymbo supradecomposito terminato myriocephalo, rotundato, 6 poll. lato; foliis cum petiolo, 4–8 lin. longo, carinâ acutâ decurrente, $3\frac{1}{2}$–2 poll. longis, $2\frac{3}{4}$–$1\frac{3}{4}$ poll. latis, subrotundatis, inferioribus subcordatis, subpalmatinerviis, leviter sinuato et irregulariter dentatis, utrinque reticulatis et præcipue ad nervos, minute puberulis, coriaceis; ramis $5\frac{1}{2}$–$2\frac{1}{2}$ poll. longis, corymbo decomposito terminatis, cum pedicellis, bracteolis anguste linearibus munitis, arachnoideis; capitulis 3 lin. et ultra longis, ovatis, semper erectis; involucri ovati, glabri, $1\frac{3}{4}$ lin. longi squamis n. 8 subæqualibus, lineari-lanceolatis, obtusis, basi squamulâ unâ alterâve, multo minore, anguste lineari munitis; floribus aureis, radii n. 5 fœmineis, breve radiantibus, disci n. 8 hermaphroditis, tubulosis; achæniis 1 lin. longis, cylindraceis, striatis, granulis crystallinis brevissime hirtis, callo basilari magno instructis; pappi 2 lin. longi, albi radiis denticulatis, superne paulisper incrassatis, singulis caducis, callo peripherico achænii insertis.—(Nomen vernaculum Mexicanorum "Pellote cimarron" sec. B. Seemann.) Sierra Madre (n. 2010).

Species distinctissima affinis *Senecioni Roldanæ*, DC., *S. reticulato*, DC., aliisque hujus sectionis speciebus.

401. Senecio *subpeltatus*, C. H. Schultz, Bip., nov. spec. Suffruticulosus, glaberrimus, elegantissimus, distinctissimus, caule speciminis nostri sesquipedali, $\frac{5}{4}$ lin. lato, tereti, lævi, medullâ farcto, foliato, panicula perfoliatâ, speciminis nostri sesquipedali, terminato; foliis inferioribus 2, superioribus 1 poll. distantibus, superne decrescentibus, tenuissime papyraceis, subpeltatis, petiolo crasso, inferne 1 lin. diametro metiente, $\frac{3}{4}$–$\frac{1}{2}$ poll. supra folii marginem inserto, medullâ farcto, 3–2 poll. longo, tereti insi-

dentibus, orbiculatis, 4–2 poll. diametro metientibus, palmatinerviis, utrinque sinuato-angulatis, sinubus, callose denticulatis, superficialibus, rotundatis, angulis acuminatis; ramis pendulis, gracillimis, inferne foliolis paucis, cum petiolo ½ poll. longis vel minoribus obsitis, subpeltatis inferioribus 4–3 poll. longis, foliis brevioribus, superioribus 5–2-cephalis foliis longioribus; capitulis ovatis ½ poll. longis, 10-floris, discoideis, petiolis capillaribus insidentibus, ¾–1½, pl. 1 poll. longis, bracteolis paucis, minutis, vix ½ lin. longis, linearibus obsitis; involucri 4 lin. longi, ovati, octophylli squamis subæqualibus, lineari-lanceolatis, apice obtusiusculo arachnoideis, intimis margine scariosis; floribus 4 lin. longis, glabris, tubo proprio campanulâ paulo breviore; genitalibus exsertis; antherarum ecaudatarum, ultra 1 lin. exsertarum articulo antherifero valde evoluto; styli ramis truncatis corpusculo rotundato subconico superatis; achæniis glabris (non penitus maturis), 1 lin. longis, in callum apicalem periphericum expansis album, cui insidet pappus copiosus, 4 lin. longus, setis vix denticulatis caducis compositus. Sierra Madre (n. 1984).

Folia speciei nostræ magis adhuc sunt peltata quam specierum Capensium, nempe *Senecionis peltati*, DC.! et *Senecionis peltiformis*, DC.!

Tribus VII. CYNAREÆ, Less.—DC. Prod. vol. vi. p. 449, excl. *Calendulaceis*, C. H. Schultz, Bip. in Linnæa, vol. xix. p. 321.

Subtribus II. CHARACOPAPPEÆ, Sz. Bip. l. c. p. 325.

Divisio III. CARDUINEÆ, Sz. Bip. l. c. p. 331.

Subdivisio I. EUCARDUINEÆ, Sz. Bip. l. c.

B. CIRSIEÆ, Sz. Bip. l. c. p. 335.

a. EUCIRSIEÆ, Sz. Bip. l. c.

402. CIRSIUM *subcoriaceum*, C. H. Schultz, Bip.—*Carduus subcoriaceus*, Less. in Linnæa, 1830, p. 130. Sierra Madre (n. 2040).

Species hæc nobilissima a cl. DC. in Prodr. omissa, quod mirandum, cum *Carduum pyrochroum*, Less., etiam p. 130 in Linnæa descriptum, sub *Erythrolæna* habeat. Cum *Cirsio nivali*, Sz. Bip., et *Cirsio conspicuo*, Sz. Bip., subgenus *Cirsii* constituit, *Lopholepidi*, DC. Prod. vol. vi. p. 634, proximum = *Erythrolæna*, Sz. Bip. Involucri ovato-hemisphærici squamæ inferiores foliaceæ, latæ, margine spinulosæ, mediæ et intimæ coriaceo-scariosæ integerrimæ.

A. EUERYTHROLÆNA, Sz. Bip. Involucri 1½ poll. longi squamæ inferiores reflexæ, reliquæ erectæ cum floribus purpurascentes; pappus 10–11 lin. longus; flos cum stylo fere sesquipollicaris. Huc *Cirsium conspicuum*, Sz. Bip. = *Erythrolæna conspicua*, Sweet.—DC. Prod. vol. vi. p. 657.—Spr.! Herb.—*Carduus pyrochros*, Less. in Linnæa, 1830, p. 130. Mexico, Veracruz, prov. Jalapam, Apr. 1838: Linden! n. 458 (= *Cirsium Jalapense*, Sz. Bip. in litt. ad cl. Linden).

B. MACROCEPHALUM, Sz. Bip. Involucri 2 poll. et ultra longi squamæ non coloratæ, pappus 1½ poll., flos cum antheris 2 poll., *C. Ehrenbergii* tantum 1½ poll. longa.

a. Involucri squamæ omnes erectæ, intimæ scariosæ.

α. Folia infra tomentosa et involucri arachnoidei squamæ spinis mitibus, 1–2 lin. longis, munita. Huc *C. subcoriaceum*, Sz. Bip.

β. Folia lanceolata, pinnatifida, infra arachnoidea et involucri albo-lanati squamæ spinis horridis, pl. 3 lin. longis, armata. Huc *Cirsium Ehrenbergii*, Sz. Bip. nov. spec. Mexico, Huajalote: C. Ehrenberg! n. 468 (v. sp. mancum in Herb. Reg. Berol.).

b. Involucri albo-lanati squamæ inferiores ad medium reflexæ, reliquæ erectæ, subcoriaceæ. Huc *Cirsium nivale*, Sz. Bip. = *Carduus nivalis*, Less. in Linnæa, 1830, p. 130 = *Cnicus nivalis*, H.B.K. In her-

bario habeo hanc speciem. Mexico: Hartweg! n. 596 (*Cirsium heterolepis*, Benth.! Pl. Hartweg. p. 87); Mexico, Veracruz, Mirador, alt. 3000′, Febr. 1839: Linden! n. 1220, et eodem loco, Jan.–Febr. 1853: amiciss. C. Sartorius! dominus Miradoris. Hujus loci etiam esse videtur *Lophiolepis nutans*, Cass. Dict. vol. xxvii. p. 182.—*Cirsium cernuum*, Lag. Gen. p. 24. n. 319.—DC. Prod. vol. vi. p. 639, minime vero *Carduus cernuus*, Less. in Linnæa, 1830, p. 128, cujus capitula ad summum 1 poll. longa sunt.

Obs. *Cirsium lappoides*, Sz. Bip. ms. — *Carduus lappoides*, Less. in Linnæa, 1830, p. 129, in DC. Prod. pariter omissum.

Tribus VIII. Mutisiaceæ, Less. Syn. p. 92.—DC. Prod. vol. vii. p. 1.

403. Gerbera (*Lieberkuhnia*) *Seemannii*, C. H. Schultz, Bip., nov. spec. Herba 2–3-caulis, spithamæa, rhizomate ♃ præmorso, fibris numerosis crassis albentibus stipato, foliis rosulatis n. 7, cum petiolis basin versus scariose dilatatis, laminam æquantibus, 1½–2 poll. longis; laminâ ovatâ ¾–1 poll. et ultra longâ, 7–9 lin. latâ, ovatâ, obtusâ, subcordatâ, subundulatâ, utrinque 2-3-sinuatâ, lobis superficialiter rotundatis, apice corneo munitis, supra glabrâ, infra tomento fugaci canâ; caulibus gracillimis, filiformibus, erectis, arachnoideis, demum glabris, bracteis n. 6–9 subulatis 2½–1½ lin. longis, adpressiusculis munitis; capitulis erectis, plurifloris; involucri 3–4 lin. longi, cylindracei, subimbricati, glabrescentis squamis linearibus, acutis margine scariosis, brunnescentibus; floribus glabris, radialibus n. 7 bilabiatis, fœmineis, 4 lin. longis; tubo 1½ lin. longo, labio externo lingulato, 2½ lin. longo, ¾ lin. lato, apice 3-dentato, interno bidentato, dentibus brevibus, anguste linearibus, erectis, styli exserti ramis cylindraceis, puberulis; floribus disci circiter totidem 3 lin. longis, prima fronte tubulosis, revera autem bilabiatis, antheris exsertis superne in tubum corneum concretis, basi bicaudatis, caudis elongatis, simplicibus, stylo incluso, subintegro apice clavato et minute puberulo; achæniis (nondum maturis) breve rostratis, dense pubescenti-hirtis, intimis verosimiliter abortientibus; pappi 2 lin. longi, obscuri, copiosi setis inæqualibus denticulatis. Sierra Madre (n. 1988).

Obs. I. Gerbera (*Lieberkuhnia*) *Ehrenbergii*, Sz. Bip. ms., affinis differt: caule breviore crassiore, foliis (an hysterantheis) integris, involucri squamis lineari-oblongis obtusis. Mexico, ad pedem m. Cerro de las Nubijas pr. Kuntz, Martio, 1839: C. Ehrenberg! n. 1278 (v. sp. in Herb. Reg. Berol.).

Obs. II. Cum *Gerbera*, Gronov.—Sz. Bip. in Flora B. Z. vol. xxvii. p. 779, porro jungenda sunt genera seq. neogenea.

Chaptalia tomentosa, *Vent.*, *DC. Prod. v. 7. p.* 41	= Gerbera Walteri, *Sz. Bip.*	
„ dentata, *Cass.*, *DC. l. c.*	= „ dentata, *Sz. Bip.*	
„ lyrata, *Don*, *DC. l. c.*	= „ lyrata, *Sz. Bip.*	
„ oblonga, *Don*, *DC. l. c.*	= „ oblonga, *Sz. Bip.*	
„ ovalis, *Don*, *DC. l. c.*	= „ ovalis, *Sz. Bip.*	
„ rotundifolia, *Don*, *DC. l. c.*	= „ rotundifolia, *Sz. Bip.*	
Leria nutans, *DC. l. c. p.* 42	= „ nutans, *Sz. Bip.*	
„ sinuata, *DC. l. c.*	= „ Selloii, *Sz. Bip.*	
„ integrifolia, *Cass.*, *DC. l. c.*	= „ integrifolia, *Sz. Bip.*	
„ leiocarpa, *DC. l. c.*	= „ leiocarpa, *Sz. Bip.*	
„ albicans, *DC. l. c.*	= „ albicans, *Sz. Bip.*	
„ pumila, *DC. l. c.*	= „ pumila, *Sz. Bip.*	
Lieberkuhnia bracteata, *Cass.*, *DC. Prod. v. 7. p.* 43	= „ bracteata, *Sz. Bip.*	
„ ? spathulata, *DC. l. c.*	= „ spathulata, *Sz. Bip.*	
Oxydon bicolor, *Less.*, *DC. Prod. v. 7. p.* 44	= „ bicolor, *Sz. Bip.*	
Loxodon brevipes, *Cass.*, *DC. l. c.*	= „ brevipes, *Sz. Bip.*	
„ Chilensis, *DC. l. c.*	= „ Chilensis, *Sz. Bip.*	
Chaptalia araneosa, *Casar*, *Walp. Rep. v.* 6. *p.* 320	= „ araneosa, *Sz. Bip.*	2 R

Obs. III. Cursonia, Nutt.—Endl. Gen. Suppl. vol. ii. p. 48.—Walp. Rep. vol. vi. p. 320 affinis, sed pappi setis 5 internis latioribus et longioribus diversa esse videtur.—*Aglaodendron*, J. Remy.—Walp. Ann. vol. ii. p. 948, etiam sec. descriptionem cognata.

Tribus IX. Nassauviaceæ, Lcss.—DC. Prod. vol. vii. p. 48.

Subtribus II. Trixideæ, Cass.—DC. Prod. l. c. p. 54.

** Pappo piloso, DC. l. c. p. 60 (excl. *Moscharia*, propr. subtribum constituente = *Moscharieæ*, Sz. Bip., ob achænia radialia, more *Melampodii*, paleis inclusa) = *Eutrixideæ*, Sz. Bip.

Divisio I. Receptaculum paleatum. Huc: *Pleocarphus*, Don.—DC. Prod. vol. vii. p. 72 (v. sp. in reliquiis Hænkei ad amicissimo Nees largitis).

Divisio II. Receptaculum nudum v. fimbrilliferum. Huc: *Trixis*, P. Browne.—C. H. Schultz, Bip., emend. in Bonplandia, ms.

Subgenus I. Eutrixis, Sz. Bip. Achænia breve rostrata, folia breve petiolata v. decurrentia.

404. Trixis *obvallata*, Hook. et Arn. Bot. Beech. Voy. 300. t. 65.—Walp. Rep. vol. ii. p. 682. Suffruticulus gracilis, ab affinibus inter alia foliis denticulatis diversus. Sierra Madre (n. 2030).

405. Trixis *frutescens*, P. Browne.—DC. Prod. vol. vii. p. 69.—Var. β. *angustifolia* = *Trixis angustifolia*, A. Gray! Pl. Wright. vol. i. p. 128, non DC. Prodr. vol. vii. p. 69. n. 16. Chihuahua, (J. Potts!).

Obs. Species quoad foliorum latitudinem et marginem, necnon capitula, nunc glomerata, nunc pedicellis ipsa æquantibus insidentia, notasque alias valde varians. In herbario habeo: Guatemala: Hartweg! n. 597; Friedrichsthal! Tepic: Sinclair! Columbia: Cuming! n. 1106. Ed. Otto! n. 392. Funk! n. 349; Havana: Ramon de la Paz! Cuba: E. Otto! n. 160; S. Martha: Bertero! (*Tenorea calyculata*) n. 2727. Mexico: C. Ehrenberg! Linden! Sartorius! Nov. Mexico: C. Wright! n. 1299 (*Trixis angustifolia*, A. Gray!)

406. Trixis *angustifolia*, DC. Prod. vol. vii. p. 69. n. 16 = *Trixis rosmarinifolia*, Nees! in Linnæa, vol. xx. p. 699. Sierra Madre (n. 2044).

407. Trixis (*Prionanthea*, DC., ad *Macrochlænam*, DC., vergens) *Hænkei*, Sz. Bip., nov. spec. Suffruticulosa, ramis teretibus $\frac{5}{4}$ lin. latis, sericeo-pubescentibus, demum glabrescentibus, foliatis, panicula corymbosa, conferta, polycephala, 4–5 poll. diametro metiente terminatis; foliis breve (2–4 lin.) petiolatis, 3–4 poll. longis, 1 poll. et ultra latis, elliptico-oblongis, utrinque acutis, penninerviis, supra glabrescentibus, infra sericeis; capitulis semper erectis, ovatis, 13-floris, pedicellis iis brevioribus, rarius longioribus insidentibus; involucri 5–6 lin. longi, ovati squamis biserialibus, dorso sericeo-pubescentibus, intimis n. 8 linearibus, breve acuminatis, extimis n. 5 brevioribus, foliaceis, lanceolatis; receptaculo fimbrillis $\frac{1}{2}$ lin. longis, albis, dense obsito; floribus pallide aureis, 4 lin. longis, glabris, bilabiatis, labio ext. lingulæformi, tridentato, int. breviore revoluto; genitalibus affinium; achæniis $3\frac{1}{2}$ lin. longis, cylindraceis, papilloso-scabris, in rostrum breve robustum attenuatis, apice in discum marginantem dilatatis cui insidet pappus 4 lin. longus, persistens, niveus, setis numerosis filiformibus, denticulatis compositus. Sierra Madre (n. 2029).

Obs. E reliquiis b. Hænkei in Herb. cl. Neesii 2 hujus speciei specimina in Mexico lecta habeo, capitulis paulo longius pedicellatis, non tam confertis et involucri squamis ext. paulo latioribus discrepantia.

Subgenus II. Macrocephalæ, Sz. Bip. Capitula multiflora, pollicem circ. longa; involucrum valde imbricatum, folia coriacea.

408. Trixis *turbinata*, Sz. Bip. ms.—*Perezia turbinata*, Lal. et Lex. Nov. Gen. Veg. vol. i. p. 25.—A. Gray! Pl. Wright. vol. i. p. 126.—*Acourtia formosa*, Don (non DC.) Trans. Linn. Soc. vol. xvi. p. 204.—*Acourtia macrocephala*, Sz. Bip. in lit. ad cl. Seem. (Tab. LV.) Herbacea, glaberrima, caule apice capitulis paucis (5) speciosissimis, 1½ poll. diametro met. terminato, foliato, foliis coriaceis, lanceolatis, falcatis, cordatis, acutis, dentato-spinosis. Sierra Madre (n. 2034).

Obs. Lal. et Lex. l. c., folia ovata describunt! Cum cl. Gray! l. c., plantæ nostræ speciosissimæ, involucro exquisite turbinato instructæ, pappi radios apice vix incrassatos vidi non vero penicillatos ut C. Don l. c. asserit. An plures species confusæ?

Plate LV. Fig. 1, portion of lower stem; 2, receptaculum; 3, corolla; 4, anthers; 5, an entire flower; 6, hair of the pappus; 7, pistil:—*all*, with the exception of 1 and 2, *magnified*.

Subgenus III. Polycephalæ, Sz. Bip. ms. Capitula mediocria, 8–12-flora, in paniculam corymbosam polycephalam disposita.

409. Trixis *Seemannii*, Sz. Bip. ms.—*Perezia Seemannii*, A. Gray! Pl. Wright. vol. i. p. 127.—*Acourtia Seemannii*, Sz. Bip. in lit. ad cl. Seem. (Tab. LIV.) Herbacea, rigida, glaberrima, paniculato-ramosissima, polycephala, foliis coriaceis, confertis, cuneato-oblongis, acutiusculis, inferne integris, ceterum spinuloso-dentatis, rameis, minimis, obovato-oblongis, integris, mucronatis. (Species distinctissima, capitulis 12-floris, achæniis papilloso-scabris, 2 lin. longis, pappo denticulato, 4 lin. longo.) Sierra Madre (n. 2033).

Plate LIV. Fig. 1, portion of the lower stem; 2, an entire capitulum; 3, receptaculum; 4, upper part of corolla; 5, an entire flower; 6, stamen; 7, ovary; 8, stigma; 9, hair of pappus:—*all*, with the exception of fig. 1, *magnified*.

410. Trixis *patens*, Sz. Bip. ms.—*Perezia patens*, A. Gray! Pl. Wright. vol. i. p. 127. excl. var. —*Acourtia formosa*, Sz. Bip. in lit. ad cl. Seem. (Tab. LVI.) Herbacea?, glaucescens, glaberrima, patenti-ramosissima, ramis corymbosis, foliis oblongis, cordatis, apice rotundatis, omnibus conferte spinulosis. Sierra Madre (n. 2032).

Obs. *Acourtia formosa*, DC. Prod. vol. vii. p. 66, sec. diagnosin huc spectare videtur, licet amic. Gray, l. c. p. 126, eam cum *Perezia* (*Trixide fruticosa*, Sz. Bip., ms.) *fruticosa*, Lal. Lex. Nov. Veg. vol. i. p. 26, jungat. Cl. Lal. et Lex. nempe *P. fruticosæ* attribuunt capitula confertissima, involucrum cylindraceum, caulem purpurascentem, folia subrotunda, floralia edentula. Nostra vero habet capitula vix contigua 4–8 ad ramorum apicem pedicellis gracilibus, iis pl. longioribus, insidentia, involucrum ovato-hemisphæricum, folia oblonga, subæquilata, obtusa, etiam summa crebre spinuloso-dentata.

Plate LVI. Fig. 1, receptaculum; 2, corolla; 3, an entire flower; 4, stamen; 5, pistil; 6, stigma; 7, hair of pappus:—*all magnified*.

LOBELIACEÆ.

411. Lobelia *Hartwegi*, Benth., De Cand. Prodr. vol. vii. p. 361.—*L. velutina*, Mart. et Gall. Wlprs. Rep. vol. ii. p. 707! Sierra Madre.

My specimens are more glabrous than those of Hartweg.

412. Lobelia *arabidoides,* Hook. et Arn. Bot. Beech. p. 301. t. 66. Cerro de Pinal; Tepic (Lay and Collie! Barclay!).

413. Lobelia *cordifolia,* Hook. et Arn. Bot. Beech. p. 301. Sierra Madre; Tepic (Lay and Collie!).

414. Lobelia *divaricata,* Hook. et Arn. Bot. Beech. p. 301. t. 67. Talisco (Lay and Collie!); Sierra Madre.

415. Lobelia *gruina,* Cav., De Cand. Prodr. vol. vii. p. 373. Sierra Madre.

416. Lobelia *fulgens,* Willd., var. *glabriuscula,* Kl.—*L. splendens,* Willd. Chihuahua (Potts!).

417. Lobelia *laxiflora,* H.B. et K., De Cand. Prodr. vol. vii. p. 383.—*L. ovalifolia,* Hook. et Arn. Bot. Beech. p. 300!—*L. lanceolata,* Hook. et Arn. l. c.!—*L. angulato-dentata,* Hook. et Arn. l. c.! Sierra Madre, in various localities; Tepic (Lay and Collie!), Oaxaca (Galeotti, 1972!), Lagos and Leon (Hartweg, 1610!), Jalapa (Linden, 420 and 451!), Zinapan (Coulter, no. 22!), Guatemala (Skinner!), Realejo (Sinclair! Barclay!).

418. Var. *angustifolia,* De Cand. Prodr. vol. vii. p. 383.—*L. persicæfolia,* H.B. et K. Sierra Madre, near Mesquital; Zinapan (Coulter, nos. 24 and 25!), Zacatecas (Hartweg, no. 103!).

SIPHONANDRACEÆ.

419. Vaccinium (§ Batodendron) *angustifolium,* Benth., Wlprs. Rep. vol. ii. p. 724. Sierra Madre.

420. Vaccinium (§ Vitis-Idæa) *confertum,* H.B. et K., De Cand. Prodr. vol. vii. p. 568.—*V. brachystachyum,* Benth. Pl. Hartweg. p. 65 et 140! Sierra Madre.

421. Arbutus *Menziesii,* Pursh, De Cand. Prodr. vol. vii. p. 582.—Nomen vernacul. "Madroño."—*A. laurifolia,* Lindl. Sierra Madre.

422. Arbutus *glandulosa,* Mart. et Gall., Wlprs. Rep. vol. ii. p. 725.—*A. densiflora,* Benth. Pl. Hartw. p. 15! Sierra Madre.

423. Arbutus *macrophylla,* Mart. et Gall., Wlprs. Rep. vol. ii. p. 725.—Nomen vernacul. "Madroño." Sierra Madre.

424. Arbutus *varians,* Benth. Pl. Hartw. p. 542. Sierra Madre.

Perhaps only a form of the preceding species.

425. Comarostaphylis *polifolia,* Zucc. Kl., Wlprs. Ann. vol. ii. p. 1107.—*Arctostaphylos polifolia,* H.B. et K. Sierra Madre.

426. Comarostaphylis *attenuata,* Kl., Wlprs. Ann. vol. ii. p. 1106. Sierra Madre.

427. Daphnidostaphylis *pungens,* Kl., Wlprs. Ann. vol. ii. p. 1109.—*Arctostaphylos pungens,* H.B.K.—Nomen vernacul. "Manzanillo." Sierra Madre.

428. Gaultheria *nitida,* Benth.? Sierra Madre.

Specimens too imperfect for exact determination.

RHODORACEÆ.

429. Befaria *Mexicana*, Benth. (Tab. LVII.); ramis ferrugineo-hirtis, foliis oblongo-lanceolatis utrinque pilis minutis raris sparse puberulis subtus glaucis, racemis terminalibus corymbosis subfoliatis, calycis laciniis lanceolatis.—Species foliis angustis et floribus amplis (albis) facile distincta. Benth. Pl. Hartw. p. 15. n. 92.—De Cand. Prodr. vol. vii. p. 732. Sierra Madre, on the road from Mazatlan to Durango; Zacatecas (Hartweg, n. 92!).

A small tree, about 20 feet high; flowers large, white.

Plate LVII. Fig. 1, a petal; 2, stamen; 3, calyx, ovary, and style; 4, capsule, nearly ripe; 5, the same, cut open:—*all slightly magnified.*

CLETHRACEÆ.

430. Clethra *Mexicana*, De Cand. Prodr. vol. vii. p. 590. Sierra Madre, near Guadalupe.

PYROLACEÆ.

431. Chimaphila *maculata*, Pursh, De Cand. Prodr. vol. vii. p. 775.—*Pyrola maculata*, Linn. Sierra Madre.

MYRSINEÆ.

432. Jacquinia *macrocarpa*, Cav., A. De Cand. Prodr. vol. viii. p. 150. Acapulco (Barclay!).

SAPOTACEÆ.

433. Lucuma? *ferruginea*, Hook. et Arn. Bot. Beech. p. 302.—De Cand. Prodr. vol. viii. p. 172. Tepic (Lay and Collie!).

There is no specimen of this in Herb. Hook.

PRIMULACEÆ.

434. Lysimachia *glaucophylla*, Hook. et Arn. Bot. Beech. p. 306. t. 68.—De Cand. Prodr. vol. viii. p. 65. Tepic (Lay and Collie!).

APOCYNEÆ.

435. Thevetia *neriifolia*, Juss., De Cand. Prodr. vol. viii. p. 343.—*Cerbera Thevetia*, Linn. Acapulco (Barclay! Sinclair!).

436. Vinca *rosea*, Linn., De Cand. Prodr. vol. viii. p. 382. Between San Blas and Tepic (Lay and Collie!).

437. Tabernæmontana *littoralis*, H.B. et K., De Cand. Prodr. vol. viii. p. 363. Acapulco (Lay and Collie!).

ASCLEPIADEÆ.

438. Sarcostemma *bilobum*, Hook. et Arn. Bot. Beech. p. 438.—*S. cynanchoides*, Dcne. in De Cand. Prodr. vol. viii. p. 540! Acapulco (Sinclair!).

439. Asclepias *glaucescens*, Kth. ! Dcne. in De Cand. l. c. p. 565. Talisco (Lay and Collie !).

440. Asclepias *curassavica*, Linn., Dcne. in De Cand. l. c. p. 566.—*A. incarnata*, Hook. et Arn. Bot. Beech. p. 438. non Linn. !—Benth. Bot. Sulph. p. 127.—Nomen vernacul. "Margarita." Common in the hotter and temperate parts of Durango and Sonora, and on the whole western coast of Mexico.

441. Asclepias *Linaria*, Cav., Dcne. in De Cand. l. c. p. 570.—Nomen vernacul. "Algodoncillo." In stony places near the city of Durango.

Geographical distribution: Diffused over the whole table-land of Mexico, from Oaxaca (Andrieux !) to Zacatecas and Durango (Hartweg ! Seemann ! Parkinson ! Coulter ! Jurgensen ! etc.).

442. Chthamalia *pedunculata*, Dcne. in De Cand. l. c. p. 605. Chihuahua (Potts !).

According to Decaisne the fruit of this herb, called Xalayote, is edible; in habit the plant resembles *Mastostigma varians*, Stocks.

GENTIANEÆ.*

(*Auctore A. Grisebach.*)

443. Gyrandra *chironioides*, Griseb. in De Cand. Prod. vol. ix. p. 44. Sierra Madre, in dry places.

The specimens of Dr. Seemann differ somewhat from those of Berlandier by longer internodia and shorter leaves (2–4‴); the latter are 4–8‴ (not 4–8″, as was stated by misprint in the original description). Sierra Madre. (n. 2067.)

444. Gyrandra *speciosa*, Benth. Bot. Sulph. p. 127. t. 45 !—*Erythræa macrantha*, β *major*, Hook. et Arn. Bot. Beech. p. 438. Tepic (Lay and Collie !).

* I have described (Bonplandia, vol. i. p. 226) a new genus of *Gentianeæ*, found by Dr. Seemann in Oahu, one of the Sandwich Islands, and dedicated by me to Dr. A. Schenk in Würzburg. I subjoin the description:—

Schenkia, novum genus *Gentianearum*. *Gen. Char.* Calyx 5-fidus, segmentis dorso alatis. Corolla infundibuliformis, marcescens, tubo cylindrico, limbo 5-partito. Stamina 5, corollæ fauci inserta, filamentis exsertis. Antheræ immutatæ, incumbentes, connectivo inani. Ovarium valvis introflexis semiquadriloculare, ovulis indefinitis margini interiori insertis. Stylus distinctus, deciduus, stigmate capitulato. Capsula bivalvis, septicida, semiquadrilocularis. Semina minuta, placentis parietalibus immersa.—Herba annua, cymis spicæformibus, floribus roseis. Genus *Sebææ* proximum et habitu conforme, capsulæ et antheræ structura distinctum, inflorescentia *Erythrææ* spicatæ accedens.

Schenkia *sebæoides*. In pratis ins. Sandwichensis "Oahu." (Seemann coll. n. 2272.) Caulis spithamæus, strictus, superne ramosus, ramis erecto-patentibus, internodiis 6–9‴ longis teretiusculis tenuissime tetrapteris. Folia ovali-orbiculata, obtusissima, basi arcte contigua, palmatinervia, nervis tenuibus, medio subtus prominulo, 6–10‴ longa, 4–6‴ lata, lævia, bracteantia sensim angustiora. Cyma spicæformis, subunilateralis, axillis ramorum flores subsessiles bibracteolatos foventibus, altera plerumque sterili, accedentibusque quandoque floribus alaribus ad ramorum basin. Flores facie *Erythrææ*, 6–7‴ longi, limbo corollæ calycem parum excedente. Calyx alis 5 lineari-lanceolatis e nervis medianis carinatus, lobis lanceolatis acuminatis subinæqualibus. Corollæ tubus limbum quadruplo excedens. Stamina limbo corollæ paullo superata, stylum subæquantia, filamentis tenuibus anthera duplo longioribus, antheris supra basin filamento insertis oblongis, quandoque gyro dimidio flexuosis. Stigma crassiusculum. Capsula oblonga, valvis intus contiguis solutis.

445. Erythræa *Chilensis*, Pers., De Cand. Prodr. vol. ix. p. 57.—*Chironia Chilensis*, Willd. Tepic (Lay and Collie!).

446. Erythræa *Texensis*, Griseb., De Cand. l. c. p. 58. Talisco (Lay and Collie!).

447. Erythræa *setacea*, Benth. Bot. Sulph. p. 128. Acapulco (Barclay!).

448. Erythræa *macrantha*, Hook. et Arn. Bot. Beech. p. 438, var. *a*.—Benth. Bot. Sulph. p. 127.—*Erythræa Mexicana*, Hook. et Arn. Bot. Beech. p. 302, ex parte! Between San Blas and Tepic (Lay and Collie!).

449. Schultesia *stenophylla*, Mart., De Cand. l. c. p. 67. Tepic (Lay and Collie!).

450. Gentiana *acuta*, Mich.—De Cand. l. c. p. 95. Sierra Madre, in woods. (n. 2069.)

451. Gentiana *detonsa*, Rottb., var.—De Cand. l. c. p. 101. Nomen vernacul. "Flor de Yelo." Sierra Madre. (n. 2070.)

This form is remarkable on account of its blunt lanceolate-oblong leaves; flowers deep blue.

452. Gentiana *spathacea*, Kth.—De Cand. l. c. p. 113. Sierra Madre. (n. 2068.)

453. Halenia *multiflora*, Benth., De Cand. l. c. p. 130. Between San Blas and Tepic (Sinclair!).

CONVOLVULACEÆ.

454. Quamoclit *vitifolia*, Don, De Cand. Prodr. vol. ix. p. 336. Tepic (Lay and Collie!).

455. Quamoclit *vulgaris*, Chois., De Cand. Prodr. vol. ix. p. 336. Between San Blas and Tepic (Sinclair!); San Sebastian.

456. Batatas *edulis*, Chois., De Cand. Prodr. vol. ix. p. 338.—*Convolvulus Batatas*, Linn.—Nomen vernacul. "Camote," being a corruption of the Aztec term "Camotl."

Extensively cultivated on account of its edible tubers.

457. Batatas *quinquefolia*, Chois., De Cand. Prodr. vol. ix. p. 339. Tepic (Barclay! Hinds!).

458. Ipomœa *muricoides*, Roem. et Schultz, De Cand. Prodr. vol. ix. p. 358. Road from Durango to Tepic.

459. Ipomœa *arborescens*, Don, De Cand. Prodr. vol. ix. p. 358.—Nomen vernacul. "Palo blanco." Road from Mazatlan to San Sebastian.

460. Ipomœa *evolvuloides*, Moric., De Cand. Prodr. vol. ix. p. 373. Acapulco (Barclay!).

461. Ipomœa *Schiedeana*, Ham.? De Cand. Prodr. vol. ix. p. 375.—Nomen vernacul. "Manto de la Virgin." Santa Lucia.

The specimens having been lost, the determination, made during my short sojourn at Santa Lucia, is doubtful.

462. Ipomœa *umbellata*, Mey., De Cand. Prodr. vol. ix. p. 377.—*Convolvulus densiflorus*, Hook. et Arn. Bot. Beech. p. 303! Tepic (Lay and Collie!).

463. Ipomœa *microsepala*, Benth. Bot. Sulph. p. 136. Acapulco (Barclay!).

464. Ipomœa *puncticulata,* Benth. Bot. Sulph. p. 136. Western coast of Mexico, exact locality unknown (Barclay !).

465. Ipomœa *trifida,* Don? De Cand. Prodr. vol. ix. p. 383. Acapulco (Barclay !).

466. Jacquemontia *pycnocephala,* Benth. Bot. Sulph. p. 137. Acapulco (Barclay !).

467. Cressa *Cretica,* Linn., var. *Truxilliensis,* Chois., De Cand. Prodr. voi. ix. p. 440. Tepic (Lay and Collie !).

468. Evolvulus *incanus,* Pers., De Cand. Prodr. vol. ix. p. 444. Chihuahua (Potts !).

469. Evolvulus *nummularius,* Linn., De Cand. Prodr. vol. ix. p. 445. Acapulco (Barclay !).

470. Evolvulus *argyræus,* Chois., De Cand. Prodr. vol. ix. p. 447. Tepic (Lay and Collie !).

471. Evolvulus *alsinoides,* Linn., De Cand. Prodr. vol. ix. p. 447. Tepic (Lay and Collie !).

472. Evolvulus *linifolius,* Linn., De Cand. Prodr. vol. ix. p. 449. Tepic (Lay and Collie !).

473. Cuscuta *umbellata,* H.B.K., De Cand. Prodr. vol. ix. p. 460. Chihuahua (Potts !).

474. Cuscuta *fœtida,* H.B.K., De Cand. l. c. p. 460. Tepic (Lay and Collie !).

475. Cuscuta *laxiflora,* Benth. Bot. Sulph. p. 138. Acapulco, on a *Tephrosia* and *Composita* (Barclay !).

476. Cuscuta *globulosa,* Benth. Bot. Sulph. p. 138. Acapulco (Barclay !).

477. Cuscuta *congesta,* Benth. Bot. Sulph. p. 138. Acapulco (Barclay !).

Another *Convolvulacea,* the same as Berlandier's nos. 638 and 2048, was found by Mr. Potts in Chihuahua, but the specimens, as well as those of Berlandier's in Herb. Hook., are too imperfect for determination. It resembles in habit some forms of *Convolvulus arvensis.*

POLEMONIACEÆ.

478. Lœselia *coccinea,* G. Don, De Cand. Prodr. vol. ix. p. 318.—*Hoitzia coccinea,* Cav. Nomen vernacul. "Guachichili." Common about Durango; Tepic (Lay and Collie! Barclay !).

In the Hookerian Herbarium there are specimens from Zinapan (Coulter, n. 1328), Oaxaca (Galeotti, n. 1443 !), Chiapas (Linden, n. 299 !), and from various other places in Mexico, not specified (C. Mackenzie! Parkinson! Gregg, n. 60! Bates! Jurgensen, n. 318 !). About Durango the leaves are used as a febrifuge, and in the southern parts of Mexico, where this shrub is vernacularly termed "Espinosilla," they, according to C. B. Heller (Reisen in Mexico, p. 412), are considered a diuretic and diaphoretic.

479. Lœselia *glandulosa,* G. Don, De Cand. l. c. p. 319. Sierra Madre; between San Blas and Tepic (Sinclair !).

480. Lœselia *involucrata,* G. Don, De Cand. Prodr. vol. ix. p. 319.—*Hoitzia lupulina,* Hook. et Arn. Bot. Beech. p. 441. Cerro de Pinal; Acapulco (Sinclair !).

481. Lœselia *amplectens,* Benth. in De Cand. Prodr. l. c. p. 320.—*Hoitzia amplectens,* Hook. et Arn. Bot. Beech. p. 441. Between San Blas and Tepic (Sinclair !).

481*. Caldasia *heterophylla,* Willd., De Cand. Prodr. vol. ix. p. 320.—*Bonplandia geminiflora,* Cav. Cerro de Pinal; Sierra Madre; Talisco (Lay and Collie !).

HYDROLEACEÆ.

482. Hydrolea *spinosa*, Linn., De Cand. Prodr. vol. x. p. 181. Acapulco (Barclay, Lay and Collie!).

483. Nama *prostrata*, Nutt. in Herb. Hook. Sierra Madre, at Rio Chico, on rocks.

484. Nama *undulata*, H.B. et K., De Cand. Prodr. vol. x. p. 182. Chihuahua (Potts!).

485. Wigandia *scorpioides*, Chois., De Cand. Prodr. vol. x. p. 184. Sierra Madre; Tepic (Lay and Collie!).

SOLANACEÆ.

486. Lycopersicum *esculentum*, Mill., De Cand. Prodr. vol. xiii. p. 26.—Nomen vernacul. "Tomate." Tepic (Barclay!); cultivated at Mazatlan and San Blas.

487. Solanum *verbascifolium*, Linn., De Cand. Prodr. vol. xiii. p. 304. Tepic (Lay and Collie!).

488. Solanum *refractum*, Hook. et Arn. Bot. Beech. p. 304.—De Cand. Prodr. vol. xiii. p. 233. Tepic (Lay and Collie!).

489. Solanum *torvum*, Swartz, De Cand. Prodr. vol. xiii. p. 260. Tepic (Lay and Collie!).

490. Solanum *Carolinianum*, Linn., De Cand. Prodr. vol. xiii. p. 304. Tepic (Lay and Collie!).

491. Solanum *rostratum*, Dun., De Cand. Prodr. vol. xiii. p. 329. Chihuahua (Potts!).

492. Solanum *heterodoxum*, Dun., De Cand. Prodr. vol. xiii. p. 331. Chihuahua (Potts!).

493. Capsicum *frutescens*, Willd., De Cand. Prodr. vol. xiii. p. 413. San Blas (Barclay!), probably cultivated.

494. Physalis *pubescens*, Linn., De Cand. Prodr. vol. xiii. p. 569. Tepic (Lay and Collie!).

495. Lycium (§ Brachycope) *barbinodum*, Miers, Ann. Nat. Hist. 2nd. Ser. vol. xiv. p. 138.—Ejusd. Illustr. S. Amer. Plants, vol. ii. p. 115. t. 68 E. Table-land of Durango (n. 2090).

496. Datura *Stramonium*, Linn., De Cand. Prodr. vol. xiii. p. 540. Western Coast (Barclay!).

497. Datura *arborea*, Linn., De Cand. Prodr. vol. xiii. p. 544.—*Brugmansia candida*, Pers. Tepic (Lay and Collie!).

498. Nicotiana *glauca*, Grah., De Cand. Prodr. vol. xiii. p. 562.—Nomen vernacul. "Arbol del Tabaco." Common in the neighbourhood of Durango, no doubt escaped from the gardens.

I have also seen this species at the Cape of Good Hope, where it is also naturalized as in Mexico. It grows willingly in very poor, arid soil, and would therefore be valuable in such parts of the tropics as are suffering from want of vegetation,—for instance, the Island of Ascension, and the Deserts of Peru, Bolivia, and Chile.

499. Nicotiana *plumbaginifolia*, Viv., De Cand. Prodr. vol. xiii. p. 569. Tepic (Lay and Collie!).

500. Cestrum *terminale*, Dun., De Cand. Prodr. vol. xiii. p. 608.—*C. Parqui*, Benth. Bot. Sulph. p. 143!—Ejusd. Plant. Hartw. p. 24. n. 208, non L'Hérit.! Sierra Madre; Tepic (Barclay!); in Pine-forests, Bolaños (Hartweg, n. 208!).

501. Cestrum *lanatum*, Martens et Gal., De Cand. Prodr. vol. xiii. p. 619. Sierra Madre.

SCROPHULARIACEÆ.

502. Pentstemon *imberbis*, Steud., De Cand. Prodr. vol. x. p. 324. Sierra Madre, in pine-woods.

503. Pentstemon *miniatum*, Lindl. Bot. Reg. (New Ser.) 1847. t. 14. Chihuahua (Potts!).

Introduced into English gardens by Mr. Potts, who transmitted the seeds to Mr. Scheer. Probably only a variety of the preceding species.

504. Russellia *rotundifolia*, Cav., De Cand. Prodr. vol. x. p. 332. Acapulco (Lay and Collie!).

505. Mimulus (§ Teneri) *Madrensis*, Seem. (Tab. LVIII.); repens, radicans, glaberrimus, foliis petiolatis orbiculato-reniformibus vel subovatis sinuato-dentatis trinervibus, pedunculis folio multo longioribus, calycibus ovatis dentibus subæqualibus, corolla (lutea) calyce duplo longiore. In swamps, on the road from Durango to Tepic.

Closely allied to *M. alsinoides*, Dougl., from which it chiefly differs in its rooting habit. Leaves about 4 lines long, and 5 or even 6 broad, of a lively green colour.

Plate LVIII. Fig. 1, a leaf and section of stem; 2, an entire flower; 3, stamens; 4, calyx and style; 5, ovary and style; 6, section of ovary; 7, an ovule:—*all magnified.*

506. Mimulus (§ Teneri) *pubescens*, Benth., De Cand. Prodr. vol. x. p. 372.—*M. glabratus*, Hook. et Arn. Bot. Beech. p. 307, non H.B.K.! Talisco (Lay and Collie!).

507. Stemodia *pusilla*, Benth. Bot. Sulph. p. 144.—De Cand. Prodr. vol. x. p. 381. Tepic (Barclay!).

508. Stemodia *durantifolia*, Swartz, De Cand. Prodr. vol. x. p. 383. Sierra Madre; Tepic (Lay and Collie!).

Appears to be the plant mentioned as *S. parviflora* in Bot. Beech.

509. Herpestris *chamædryoides*, H. B. et Kth., De Cand. Prodr. vol. x. p. 393. Tepic (Lay and Collie!).

510. Herpestris *Monniera*, H. B. et Kth., De Cand. Prodr. vol. x. p. 400.—*Gratiola Monniera*, Linn. Tepic (Lay and Collie!).

511. Capraria *biflora*, Linn., De Cand. Prodr. vol. x. p. 429.—*C. hirsuta*, H.B.K., ex parte. Tepic (Lay and Collie! Barclay!).

512. Pogostoma *saxifragæfolia*, Schrad., De Cand. Prodr. vol. x. p. 430.—*Capraria saxifragæfolia*, Cham. et Schlecht. Tepic (Lay and Collie!).

513. Scoparia *dulcis*, Linn., De Cand. Prodr. vol. x. p. 431. Tepic (Lay and Collie!).

514. Scoparia *annua*, Cham. et Schlecht., De Cand. Prodr. vol. x. p. 431. Tepic (Lay and Collie!).

515. Buddleia *verticillata*, H. B. et Kth., De Cand. Prodr. vol. x. p. 441. Neighbourhood of Durango.

There appears to be no difference between my specimens and the typical ones of *B. verticillata*, except that they have shortly-pedunculate instead of subsessile cymes.

516. Buddleia *scorpioides*, H.B.K., De Cand. Prodr. vol. x. p. 442. Chihuahua (Potts!); New Mexico (Wright, nos. 448 and 1486!).

The Genus *Buddleia* and its allies have recently been referred by Bentham (Journal of the Proceedings of the Linnæan Society, vol. i. p. 52 *seq.*) to *Loganiaceæ*.

517. Buchnera *elongata*, Swartz, De Cand. Prodr. vol. x. p. 498. Tepic (Barclay!).

518. Buchnera *obliqua*, Benth., De Cand. Prodr. vol. x. p. 498. Sierra Madre.

Flowers blue.

519. Buchnera *Americana*, Linn., var. *glabrior*, Benth. mss. Sierra Madre.

Flowers pale blue.

520. Seymeria (§ Cassioides) *bipinnatisecta*, Seem. (Tab. LIX.); suffruticosa, glandulosa, pubescens, foliis bipinnatisectis, corollæ laciniis obovato-oblongis, stylo subexserto, ovariis capsulisque ovatis subrostratis pubescentibus. Sierra Madre (n. 2102).

Allied to *S. pectinata*, Pursh. The whole plant about 2 feet high. Leaves, including petiole, often 2 inches long. Flowers pale yellow.

Plate LIX. Fig. 1, an entire flower; 2, corolla, cut open; 3, ovary and style; 4, section of ovary; 5, entire ovary:—*all magnified.*

521. Seymeria (§ Cassioides) *virgata*, Benth. (Tab. LX.); suffruticosa, tenuissime viscido-puberula, foliis pinnatisectis laciniis anguste linearibus plerisque incisis, corollæ laciniis ovatis, capsulis subrostratis glabriusculis.—Benth. in De Cand. Prodr. vol. x. p. 511. Sierra Madre (n. 2016); Real del Monte (Coulter, 1280!).

Plate LX. Fig. 1, an entire flower; 2, corolla, cut open; 3, one of the stamens; 4, ovary and style; 5 and 6, sections of ovary; 7, ripe capsule; 8, section of capsule; 9, seed; 10, transverse section of seed; 11, embryo:—*all magnified.*

522. Gerardia *peduncularis*, Benth., De Cand. Prodr. vol. x. p. 518. In a baranca, near the village of Santa Teresa, on the road from Durango to Tepic.

Corolla of a fine pink colour.

523. Castilleja *lithospermoides*, H. B. K., De Cand. Prodr. vol. x. p. 530. Sierra Madre.

524. Castilleja *affinis*, Hook. et Arn. Bot. Beech. p. 154.—De Cand. Prodr. vol. x. p. 532. Sierra Madre.

525. Castilleja *canescens*, Benth., De Cand. Prodr. vol. x. p. 533.—*C. integrifolia*, H.B.K., vix Linn. Sierra Madre; Tepic (Lay and Collie!).

526. Lamourouxia *multifida*, H. B. K., De Cand. Prodr. vol. x. p. 540.—*L. miniata*, Mart. et Gal.? Sierra Madre.

527. Lamourouxia *longiflora*, Benth., De Cand. Prodr. vol. x. p. 540. Sierra Madre.

Corolla scarlet.

528. Lamourouxia *cordata*, Cham. et Schlecht., De Cand. Prodr. vol. x. p. 541. Zacatecas (Hartweg!); Acapulco (Barclay!); Talisco (Lay and Collie!).

529. Lamourouxia *viscosa*, H. B. K., De Cand. Prodr. vol. x. p. 542. Cerro de Pinal; Sierra Madre; Acapulco (Barclay!).

Corolla pink.

530. Pedicularis *angustifolia*, Benth., De Cand. Prodr. vol. x. p. 567. Sierra Madre, road from Mazatlan to Durango; Hartweg found it near Bolaños.

Corolla yellow.

LENTIBULARIÆ.

531. Pinguicula *lilacina*, Schlecht. et Cham., De Cand. Prodr. vol. viii. p. 31.—*P. nana*, Mart. et Gal.! Cerro de Pinal (n. 1514); Sierra Madre (n. 2118); between San Blas and Tepic (Sinclair!); Oaxaca (Galeotti, nos. 859 and 861!); Jalapa (Linden, n. 161!).

Flowers varying from deep lilac-colour to almost pure white.

ACANTHACEÆ.

532. Elytraria *apariginifolia*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 56. Tepic (Sinclair!); Mexico (Parkinson!).

533. Elytraria *ramosa*, H. B. K., De Cand. Prodr. vol. xi. p. 65. Mazatlan (Seemann, n. 1512; Coulter, n. 1207!); Acapulco (Barclay!).

534. Calophanes *bilabiatus*, Seem. (Tab. LXV.); villoso-pubescens, foliis ovato-oblongis utrinque acuminatis dentatis, floribus axillaribus cymosis, cymis pedunculatis 3–5-floris, bracteis subulatis, laciniis calycis profunde divisis filiformibus longitudine tubi corollæ, corolla puberula subbilabiata, staminibus 4, antheris omnibus biloculariibus basi bicalcaratis, ovario styloque glabris, stigmate linearioblique. Cerro de Pinal.

A weed, about 3 feet high. Leaves, including petiole, 1½–2 inches long, and in the broadest part 5–6 lines broad. Flowers pale-blue.—If not all the essential characters and the habit agreed with *Calophanes*, I should have placed this species as a new genus amongst the *Gendarusseæ*, to which it is related through its almost bilabiate corolla, but from which it differs in having none but bilocular anthers.

Plate LXV. Fig. 1, an entire flower; 2, corolla, cut open; 3, upper part of a stamen; 4, disc, ovary, and style:—*all magnified.*

535. Selerocalyx *Mexicanus*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 219. Acapulco (Barclay!).

536. Dipteracanthus *rubicaulis*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 116.—*D. fœtidus*. Nees ab Esenb. in Benth. Bot. Sulph. p. 146.—*Ruellia fœtida*, Willd. Acapulco (Barclay!).

537. Dipteracanthus *Hænkei,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 141.—*Aphragmia Hænkei,* Nees ab Esenb. in Benth. Bot. Sulph. p. 146. Acapulco (Barclay !).

538. Aphelandra *pectinata,* Willd., De Cand. Prodr. vol. xi. p. 297.—*A. cristata,* H. B. K., ex parte. Acapulco (Lay and Collie ! Barclay !).

539. Jacobinia *Mexicana,* Seem. (Tab. LXVI.); sericeo-pubescens, demum glaberrima, foliis ovatis acuminatis integerrimis, floribus axillaribus sessilibus bracteolis dorso-acuminatis calyce brevioribus, corolla hirsuto-pubescente, labio superiore bidentato, labio inferiore trifido, staminibus 2, antherarum loculis ad apicem usque connectivo anguste discretis basi divergentibus, ovario capsulaque glabris. Sierra Madre (n. 2115 !).

A shrub about 4 feet high; branches stiff, and ultimately, in consequence of the peeling off of the bark, becoming white; leaves of a lively green, about an inch or 1½ inches long, and half an inch broad; corolla scarlet; capsule tetraspermous.—The calyx is not so deeply cut as is the case in the Peruvian species, but in other respects the plant agrees well with the general character and habit of the genus.

Plate LXVI. Fig. 1, an entire flower; 2, corolla, cut open; 3, upper part of a stamen; 4, ovary and glandular disc surrounding it:—*all magnified.*

540. Sarotheca *salviæflora,* Nees ab Esenb. (Tab. LXVII.); pubescens vel subvillosa, foliis ovato-oblongis acuminatis integerrimis vel subrepando-crenatis in petiolum decurrentibus, spicis subsimplicibus paucifloris, calycis laciniis bracteisque lanceolatis setaceo-acuminatis, corollæ labio superiore fornicato bidentato, inferiore trifido, ovario glabro.—*S. salviæflora,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 382.—*S. rostrata,* Nees ab Esenb. l. c. !—*Justicia salviæflora,* Kth. !—*J. rostrata,* Bertel. Sierra Madre (n. 2113 !).

S. salviæflora and *S. rostrata* agreeing with each other in the most essential particulars, and my specimens from the Sierra Madre forming a complete transition between them, I have little hesitation in uniting them under the oldest name. The leaves in my specimens are mostly quite entire, as they are stated to be in the true *S. rostrata,* but some show a tendency to become repando-crenate, as Nees says they are in the form collected by Humboldt and Bonpland under the name of *S. salviæflora.* The upper lip of the corolla is in all my specimens bidentate; the flowers are pale-blue.

Plate LXVII. Fig. 1, an entire flower; 2, corolla, cut open; 3, upper part of a stamen; 4, disc, ovary, and style:—*all magnified.*

541. Anisacanthus *pumilus,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 445. Plains of Durango.

542. Tetramerium *nervosum,* Nees ab Esenb.—Var. *angustifolium,* Nees ab Esenb., De Cand. Prodr. vol. xi. p. 468. Tepic (Barclay !).

543. Tetramerium *polystachyum,* Nees ab Esenb. (Tab. LXVIII.); caule ramosissimo, petiolisque patenti-hirsutis, foliis ovatis basi obtusis apice attenuatis, spicis in ramulis brevibus axillaribus oppositis terminalibus, bracteis oblongo-ovalibus mucronatis.—De Cand. Prodr. vol. xi. p. 468. Sierra Madre (Seemann, n. 2112 !); Gulf of Fonseca (Sinclair !).

A shrub from 2 to 3 feet high. Leaves, including petiole, from 1½ to 2 inches long, and, in the widest part, from 4 to 6 lines broad. Flowers pink.

Plate LXVIII. Fig. 1, a branch, when just beginning to flower; 2, an entire flower; 3, corolla, cut open; 4 and 5, upper parts of stamens; 6, disc, ovary, and style:—*all, with the exception of fig.* 1, *magnified.*

BIGNONIACEÆ.

544. Tecoma *stans*, Juss., De Cand. Prodr. vol. ix. p. 224. Sierra Madre, near the village of Santa Lucia; Acapulco (Lay and Collie!).

545. Chilopsis *linearis*, De Cand. Prodr. vol. ix. p. 227.—*Catalpa Pottsii*, Seem. in Otto und Dietr. Allgem. Gartenzeit. vol. xix. p. 321! Chihuahua (Potts!).

Geographical distribution: Mexico (Tate! Gregg, no. 20!); between Western Texas and El Paso, New Mexico (C. Wright, no. 428!); California (W. Lobb! Coulter, no. 634!).

CRESCENTIACEÆ.

546. Crescentia *alata*, H.B.K., De Cand. Prodr. vol. ix. p. 247.—*C. trifolia*, Blanco, Flor. de Filip. p. 489!—Nomen vernacul. "Tecomate." Common on the western coast from Acapulco to Mazatlan (Seemann! Gregg, no. 944!).

The shell of the fruit is made into drinking-cups, and its pulp, boiled with sugar, is administered internally to those suffering from complaints of the chest (consumption?).

GESNERACEÆ.

547. Dicyrta *parviflora*, Seem. (Tab. LXIX.); caule gracili cum tota herba hirsuto læte viridi, propagulis . . . ., foliis ovatis acuminatis grosse inæqualiter serratis in petiolum angustatis, pedunculis axillaribus binis ternisve unifloris folio brevioribus vel subæquantibus, corolla tubuloso-infundibuliformi (alba?) limbo erecto-patente, tubo calycis laciniis anguste lanceolatis 2–3-plo longiore sursum ampliato, annulo glanduloso tenuiore vix pentagono.—*Trevirana parviflora*, Hook. et Arn. Bot. Beech. p. 302. Tepic (Lay and Collie!).

This plant agrees most with the characters of the Genus *Dicyrta*, Regel, as laid down by Dr. Hanstein in his excellent paper on *Achimeneæ* in the Linnea, but there are several points of difference about which it is necessary to offer some remarks. The figure of our Plate (Tab. LXIX.) was taken from dried specimens collected in 1828 by Beechey's Expedition, in the neighbourhood of Tepic, and it is quite possible that the shape of the corolla may be more curved than it is there represented; nor can very much reliance be placed on the representation of the stigma, as, in the few specimens that could be subjected to analysis, it was so much injured by pressing that its real character had in a great measure been lost, but quite enough remained to show that it is not bi-lamellate, but rather stomatomorphous. The anthers appeared to be free, at least the two longer stamens were not connected with the two shorter. In general habit our plant agrees with that of the two *Dicyrta* described, but approaches nearest to *D. candida*, Hanst. Stem, leaves, peduncles, and calyx hirsute, dark green; leaves, including petiole, 1½ inches long, in the widest part 9 lines broad; corolla glabrous outside, and hairy inside the tube; ovary and stamens 4, didynamous, glabrous, with the rudiment of the fifth; capsule unknown. There are three specimens in the Hookerian Herbarium, but none have any root.

Plate LXIX. Fig. 1, corolla; 2, the same, cut open; 3, ovary and style; 4 and 5, stamens:—*all magnified.*

548. Scheeria *Mexicana*, Seem. in Bot. Mag. t. 4743.—Regel, Gartenflora, Jahrg. 1853. t. 71.—*Mandirola Seemanni*, Ch. Lem. Ill. Hort. vol. iii. in descript. t. 80.—*Achimenes Scheerii* et *A. Chirita*, Hort. Chihuahua (Potts!).

The second species of *Scheeria* mentioned at p. 185 of this Work (*S. ichthyostoma*, Seem.) must be removed from this Genus, and be placed under *Mandirola* (*M. ichthyostoma*, Seem. !).

549. Gesnera *Deppeana*, Cham. et Schlecht., De Cand. Prodr. vol. vii. p. 528. Tepic (Lay and Collie !).

LABIATÆ.

550. Hyptis *capitata*, Jacq., De Cand. Prodr. vol. xii. p. 106. Acapulco (Barclay ! Sinclair !).

551. Hyptis *rhytidea*, Benth., De Cand. Prodr. vol. xii. p. 118. Tepic (Sinclair !).

552. Hyptis *polystachya*, Kth., De Cand. Prodr. vol. xii. p. 121. Tepic (Barclay !).

553. Hyptis *spicata*, Poit., De Cand. Prodr. vol. xii. p. 121. Tepic (Barclay !).

554. Hyptis *urticoides*, Kth., De Cand. Prodr. vol. xiii. p. 123. Sierra Madre.

555. Hyptis *albida*, Kth., De Cand. Prodr. vol. xii. p. 127. Sierra Madre (n. 2073 !).

556. Hyptis, sp. Cerro de Pinal.

557. Calamintha *macrostema*, Benth., De Cand. Prodr. vol. xii. p. 229. Sierra Madre (n. 2094 !).

558. Salvia *occidentalis*, Swartz, De Cand. Prodr. vol. xii. p. 296. Tepic (Sinclair !).

559. Salvia *flexuosa*, Presl, De Cand. Prodr. vol. xii. p. 299. Sierra Madre (n. 2075 !).

560. Salvia *lasiocephala*, Hook. et Arn. Bot. Beech. p. 306.—De Cand. Prodr. vol. xii. p. 300. Tepic (Barclay ! Sinclair !).

561. Salvia *lavanduloides*, Kth., De Cand. Prodr. vol. xii. p. 303. Sierra Madre (n. 2081 !).

562. Salvia *prasiifolia*, Benth. Bot. Sulph. p. 151.—De Cand. Prodr. vol. xii. p. 310. Tepic (Hinds ! Sinclair !).

563. Salvia (§ Calosphace, Brachyanthæ, Vulgares) *Sanctæ-Luciæ*, Seem.; villoso-pubescens, caule suffruticoso erecto, foliis ovatis acuminatis in petiolum attenuatis acute serratis subtus pallidioribus, racemis paniculatis, verticillastris paucifloris (2–6), bracteis ovatis longe acuminatis coloratis (violaceis?), calycibus pedicellatis campanulatis striatis pubescentibus dentibus mucronatis, corolla calyce duplo longiore glabra, tubo ventricoso, stylo glabro. Near the village of Santa Lucia, Sierra Madre (n. 2071 !).

A half-shrubby plant. Leaves, including petiole, 4–5 inches long, blade 2½ inches broad. Corolla flesh-coloured. Near *S. stachydifolia*.

564. Salvia *scorodoniæfolia*, Poir., De Cand. Prodr. vol. xii. p. 316. Tepic (Barclay !); Sierra Madre (n. 2076 !).

565. Salvia *thyrsiflora*, Benth. Bot. Sulph. p. 151.—De Cand. Prodr. vol. xii. p. 316. Tepic (Barclay ! Sinclair !).

566. Salvia (§ Calosphace, Longifloræ, Luteæ) *Madrensis*, Seem. (Tab. LXX.); glanduloso-pubescens, caule fruticoso-erecto, foliis cordatis vel (superioribus) ovatis acuminatis crenatis, subtus

albicantibus, racemis simplicibus verticillastris multifloris (14–18), corolla (lutea) calyce subcampanulato duplo-triplore longiore, tubo subventricoso, labio superiore integro, labio inferiore trilobo, stylo ovariisque glabris. Sierra Madre (n. 2079 !).

A very fine species, forming erect shrubs from 3 to 4 feet high. Stem quadrangular. Leaves, including petiole, sometimes nearly a foot long, and in the widest part 5 to 6 inches broad. Corolla $1\frac{1}{2}$ inches long, shorter than the Style. Ovaries glabrous.

Plate LXX. Fig. 1, an entire flower; 2, corolla, cut open; 3 and 4, ovaries; 5, one of the ovaries:— *all magnified.*

567. Salvia *purpurea,* Cav., De Cand. Prodr. vol. xii. p. 341. About the village of Santa Lucia (n. 2080 !).

568. Salvia *elegans,* Vahl, De Cand. Prodr. vol. xii. p. 342. Santa Lucia; Chihuahua (Potts !).

Raised by Mr. Scheer at Northfleet, from seeds received from Mr. Potts. Forms in the open border a thick bush, about three feet high.

569. Cedronella *cordata,* Benth., De Cand. Prodr. vol. xii. p. 405. Chihuahua (Potts !).

Seeds of this species were received with those of the preceding one from Mr. Potts, and plants were raised from them by Mr. Scheer in 1851, when they flowered well in the open border.

570. Marrubium *vulgare,* Linn., De Cand. Prodr. vol. xii. p. 453. Waste places in the neighbourhood of Durango.

VERBENACEÆ.

571. Verbena *Caroliniana,* Linn., De Cand. Prodr. vol. xi. p. 546.—*V. veronicæfolia,* Kunth. Tepic (Sinclair ! Lay and Collie !).

572. Verbena *ciliata,* Benth., De Cand. Prodr. vol. xi. p. 553.—*V. Aubletia,* Hook. et Arn. Bot. Beech. p. 305, non Jacq. Chihuahua (Potts !); Zacatecas (Hartweg, n. 176 !); Zinapan (Coulter, n. 1149 ex parte !); New Mexico (Fendler, n. 586 !); Mexico (Gregg, n. 26 !).

573. Stachytarpha *dichotoma,* Vahl, De Cand. Prodr. vol. xi. p. 561. var.? foliis subtus velutino-hirtis. Tepic (Lay and Collie !); Acapulco (Sinclair !).

This is the plant mentioned in Beechey's Botany and the Botany of the 'Sulphur' as *S. dichotoma,* Vahl, from which however it seems quite distinct; but as there are only a few indifferent specimens of it in the Hookerian Herbarium, I have not ventured to characterize it as new.

574. Lippia *lycioides,* Steudl., De Cand. Prodr. vol. xi. p. 574. Plains of Durango; Sonora Alta (Coulter, nos. 1139, 1166 !); Zinapan (Coulter, nos. 1137 ex parte, 1138 !); Mexico (Gregg, n. 145 !); Texas (Lindheimer, n. 502 ! Berlandier, n. 3005 !); Tehuacan (Galeotti, n. 774 !).

575. Lippia *hirsuta,* Mutis, De Cand. Prodr. vol. xi. p. 580.—*L. callicarpa,* Hook. et Arn. Bot. Beech. p. 305, non H.B.K. ! Talisco (Lay and Collie !); Hacienda de las Naranjas, foot of the Cerro de Pinal (Seemann, n. 1499 !).

576. Lippia *purpurea,* Jacq., De Cand. Prodr. vol. xi. p. 581. Sierra Madre; between Western Texas and El Paso, N. Mexico (Wright, n. 458 !); Zinapan (Coulter, n. 1156 !); Oaxaca (Galeotti, n. 762 !).

577. Lippia *geminata*, Kth., De Cand. Prodr. vol. xi. p. 582.—*Lantana lippioides*, Hook. et Arn. Bot. Beech. p. 305. Acapulco and Talisco (Lay and Collie!).

578. Lantana *Camara*, Linn., De Cand. Prodr. vol. xi. p. 598.—*Camara vulgaris*, Benth. Bot. Sulph. p. 154! Acapulco (Barclay fide Benth.!).

579. Lantana *hirsuta*, Mart. et Gal., De Cand. Prodr. vol. xi. p. 599. Village of Santa Lucia, where it is termed "Sonora."

I do not see any essential difference between this species and *L. Camara*, for which I took it when collecting it.

580. Lantana *velutina*, Mart. et Gal., De Cand. Prodr. vol. xi. p. 605. Sierra Madre.

581. Citharexylum *affine*, D. Don, De Cand. Prodr. vol. xi. p. 611.—*C. reticulatum*, Hook. et Arn. Bot. Beech. p. 306, non H.B.K.! Talisco (Lay and Collie!).

582. Vitex *mollis*, Kunth (Tab. LXXI.); arborescens vel arborea, ramulis petiolis cymis foliorumque dorso molliter tomentoso-pubescentibus villosisve, foliis aliis integris aliis trifoliolatis, foliolis oblongis obtusis basi plus minusve attenuata sessilibus vel petiolulatis integerrimis subcoriaceis, adultis supra glabratis nitidis, cymis axillaribus pedunculatis paucifloris bisterve bifidis divaricatis, calyce pedicellato repando 5-dentato, corollæ tubo calyce duplo triplove longiore campanulato labio inferiore porrecto basi barbato, capsula obovato-rotundata glabra.—*V. mollis*, Kunth in Humb. et Bpl. Nov. Gen. et Sp. vol. ii. p. 245.—*V. lasiophylla*, Benth. Bot. Sulph. p. 155! Village of Santa Lucia; Acapulco (Lay and Collie!); from San Blas to Guadalajara (Coulter, n. 1168!); other parts of Mexico, not specified (Coulter, n. 545! Jürgensen, n. 52!); Manzanilla Bay (Barclay!).

A tree about 30 feet high, with long straggling branches, and clothed with either greyish or more or less brown hair. Corolla pale blue.

Plate LXXI. Fig. 1, an entire flower; 2, a stamen; 3, ovary and style; 4 and 5, sections of ovary; 6, section of fruit:—*all magnified.*

BORAGINEÆ.

583. Cordia *Gerascanthus*, Jacq., De Cand. Prodr. vol. ix. p. 472. Mazatlan! Acapulco (Barclay!).

584. Cordia *ferruginea*, Rœm. et Schult., De Cand. Prodr. vol. ix. p. 448. Tepic (Barclay!).

585. Tournefortia *Hartwegiana*, Steudl., De Cand. Prodr. vol. ix. p. 515.—*T. undulata*, Benth., Pl. Hartweg. p. 20 et 32. Sierra Madre (Seemann, n. 2087!); Bolaños (Coulter, n. 1066!); Zacatecas (Hartweg, n. 156!); Tepic (Lay and Collie!).

586. Tournefortia *calycina*, Benth. Bot. Sulph. p. 139.—*T. capitata*, Mart. et Gal., Wlprs. Rep. vol. vi. p. 555. Cerro de Pinal; Acapulco (Barclay!).

587. Tournefortia *hirsutissima*, Linn., De Cand. Prodr. vol. ix. p. 517. Tepic (Lay and Collie!).

588. Tournefortia *velutina*, H. B. et Kth., De Cand. Prodr. vol. ix. p. 524. Acapulco (Barclay!).

589. Heliophytum *parviflorum*, De Cand. Prodr. vol. ix. p. 553.—*Heliotropium parviflorum* Linn. A common weed on the western coast.

590. Heliophytum *Indicum*, De Cand. Prodr. vol. ix. p. 556.—*Heliotropium Indicum*, Linn. A common weed on the western coast.

PLUMBAGINEÆ.

591. Plumbago *scandens*, Linn., De Cand. Prodr. vol. xii. p. 692. Common on the western coast of Mexico.

PHYTOLACCEÆ.

592. Petiveria *alliacea*, Linn., De Cand. Prodr. vol. xiii. part ii. p. 9. Tepic (Lay and Collie!).

593. Rivinia *lævis*, Linn., De Cand. Prodr. vol. xiii. part ii. p. 11. Mazatlan, in waste places (n. 1517).

594. Rivinia *humilis*, Linn., De Cand. Prodr. vol. xiii. part ii. p. 13. Tepic (Lay and Collie, fide Hook. et Arn. Bot. Beech.).

595. Phytolacca *octandra*, Linn., De Cand. Prodr. vol. xiii. part ii. p. 32. Waste places about the village of Santa Lucia. Tepic (Barclay!).

AMARANTHACEÆ.

596. Iresine *interrupta*, Benth. Bot. Sulph. p. 156. Tepic; Acapulco (Barclay! Sinclair!).

597. Brandesia *pycnantha*, Benth. Bot. Sulph. p. 157. Acapulco (Barclay!).

598. Achyranthes *aspera*, Linn. Tepic (Barclay!), probably introduced.

599. Chamissoa *allissima*, Swartz, Benth. Bot. Sulph. p. 158. Tepic (Barclay!).

600. Celosia *nitida*, Vahl? Between San Blas and Tepic (Barclay!).

NYCTAGINEÆ.

601. Boldoa *lanceolata*, Lag., De Cand. Prodr. vol. xiii. part ii. p. 438.—*Salpianthus arenarius*, H.B.K. Acapulco (Barclay!).

602. Boldoa *ovatifolia*, Lag., De Cand. Prodr. vol. xiii. part ii. p. 438.—Benth. Bot. Sulph. p. 155. Tepic (Sinclair!).

603. Boldoa *purpurascens*, Cav., De Cand. Prodr. vol. xiii. part ii. p. 439.—*Salpianthus purpurascens*, Hook. et Arn. Bot. Beech. p. 308. Tepic (Lay and Collie!).

604. Pisonia *aculeata*, Linn., De Cand. Prodr. vol. xiii. part ii. p. 440.—*P. Pacurero*(?), Hook. et Arn. Bot. Beech. p. 308, non H.B.K.! Tepic (Lay and Collie!).

605. Boerhaavia *hirsuta*, Willd., De Cand. Prodr. vol. xiii. part ii. p. 451.—*B. polymorpha*, A. Rich., Benth. Bot. Sulph. p. 155. Tepic (Lay and Collie!).

POLYGONACEÆ.

606. Erigonum *helianthemifolium*, A. Gray, mss. (Wright, Plant. N. Mexic. exsic. n. 624!). Chihuahua (Potts!).

607. Erigonum *Abestianum*, A. Gray, mss. (Wright, Plant. N. Mexic. exsic. n. 620 et 622!). Chihuahua (Potts!).

608. Polygonum *acre*, H.B.K., Nov. Gen. et Spec. vol. ii. p. 179. Western coast of Mexico (Barclay!).

609. Antigonon *leptopus*, Hook. et Arn. Bot. Beech. p. 308. t. 69!—Benth. Bot. Sulph. p. 47 et 160.—Nomen vernacul. "Rosa de Mayato." Between Mazatlan and Santa Lucia, common; San Blas (Barclay!); Tepic (Lay and Collie!); Cape San Lucas, California (Sinclair!).

LAURINEÆ.

610. Nectandra (§ Porostema) *glabrescens*, Benth. Bot. Sulph. p. 161.—*Ocotea salicifolia*, Hook. et Arn. Bot. Beech. p. 309, vix H.B.K. San Blas; Acapulco; Tepic (Lay and Collie! Barclay!).

611. Cassytha *Brasiliensis*, Mart., Nees ab Esenb. Syst. Laurineæ, p. 648. Sierra Madre, growing on *Vaccinieæ*.

ARISTOLOCHIEÆ.

612. Aristolochia *Taliscana*, Hook. et Arn. Bot. Beech. p. 309. Talisco (Lay and Collie!); Manzanilla Bay (Barclay!).

613. Aristolochia (§ Clematitis) *Wrightii*, Seem. (Tab. LXXII.); perennis, villoso-pubescens, ramis diffusis, foliis cordato-reniformibus vel plus minusve trilobis vel imo (Wright, n. 1701!) subhastatis apice acutis vel obtusiusculis tri- vel quintupli-nerviis, floribus axillaribus solitariis, perigonio hirsuto unilabiato, labio elongato tubo æquante, staminibus 6, capsula obovata vel ovato-oblonga. —*A. fœtida*, var. *brevipes*, Benth. Plant. Hartweg. Durango (n. 2175).

One of the smaller species, named in honour of the zealous and indefatigable traveller, Mr. Charles Wright, who collected it in four different localities of New Mexico (Wright, 1700 and 1701!), and between Western Texas and El Paso, N. Mexico (Wright, 567 and 568!); Hartweg found it at Zacatecas, and I in the neighbourhood of Durango, where it seems by no means abundant, as I only noticed it once. The size of the whole plant, and especially that of the leaves (as well as their form) vary extremely; the smallest leaves are scarcely 4 lines long, and 3 lines broad, the largest about $1\frac{1}{2}$ inch long, and 1 inch 3 lines broad. The colour of the corolla is a dull brown.

Plate LXXII. Fig. 1, corolla; 2, stamens and ovary; 3 and 4, seeds:—*all magnified.*

ARTOCARPEÆ.

614. Ficus *lancifolia*, Hook. et Arn. Bot. Beech. p. 310. Tepic (Lay and Collie!).

CUPULIFERÆ.

615. Quercus *acutifolia*, Née, H.B. et Kth., Nov. Gen. et Spec. vol. ii. p. 10.—Lieb. Monograph. Querc. Mex. ined.—Nomen vernacul. "Encino chino." Sierra Madre (n. 1996!).

616. Quercus *Mexicana*, H.B.K. l.c. p. 6. Sierra Madre (nos. 1976, 1977, and 1978!).

The leaves gradually getting smaller as the tree ascends the tops of the mountains. Found on the highest summits, where all other Oaks have ceased, and forming there more bushes than trees.

617. Quercus *Mexicana*, var. *glabrata*, Lieb. Monograph. ined.; ramulis gracilibus angulatis sulcatis glabris atro-purpureis apicem versus villo detergibili obsitis; foliis membranaceis brevi-petiolatis lineari-lanceolatis integerrimis acutis apiculatis basi obtuse cuneatis interdum obliquis, nervis utrinsecus 12–14, minoribus interjectis, a medio fere furcato-ramificatis et angulato-anastomosantibus subtus prominentibus, utrinque glaberrimis subtus pallidioribus, interdum secus costam villo detergibili adspersis, petiolo primum adsperse villoso, mox glabro; fructibus solitariis v. geminis subsessilibus, cupula (juniori) turbinata, squamis adpressis dense imbricatis obtusis leviter puberulis; glande . . . . —Folia 2–4″ longa, 6–9‴ lata, petioli 2–3‴. Gemmæ ovatæ, squamis glabris ovatis obtusis ciliolatis.—Coll. Seemanni, n. 1974 in Herb. Hook. (specimina c. fr. juniori). Nomen vernacul. "Encino saucillo." Sierra Madre.

618. Quercus *elliptica*, Née! in Anales de Ciencias, vol. iii. p. 278.—Coll. Seemanni, n. 1975 in Herb. Hook. Sierra Madre (flor. c. fr. junior.).

Species adhuc male nota et confusa.

619. Quercus *crassifolia*, H.B.K., Nov. Gen. et Sp. vol. ii. p. 12. Sierra Madre (n. 1968!).

The leaves of this beautiful species are of great thickness, and often nearly 1 foot across.

620. Quercus *aristata*, Hook. et Arn. Bot. Beech. p. 444. Cerro de Pinal (n. 1458!).

621. Quercus *læta*, Lieb., Bonpl. vol. iii. p. 38 (*Q. obtusata*, Benth. Pl. Hartw. p. 419. nec H.B.K.); ramis teretibus glabris fuscis, ramulis angulatis pilis stellatis detergibilibus obsitis, foliis coriaceis brevi-petiolatis oblongis utrinque obtusis basi cordato-emarginatis grosse crenato-repandis, arenis obtusis interdum apiculo calloso terminatis, nervis utrinsecus 8–10 excurrentibus, minoribus interjectis, transverse reticulato-venulosis, nervis venulisque subtus prominentibus, supra dilute viridibus nitidis in junioribus pilis stellatis adspersis, subtus glaucis pilis stellatis dense tomentosis, petiolis teretibus tomentosis; pedunculis axillaribus tenuibus flexuosis adsperse pilosis, fructibus interrupte spicatis, paucis intermediis solummodo evolutis; glande ovoidea apiculata basi depressa nitida glabra, cupula patelliformi basin glandis amplectente, squamis minutis arcte imbricatis lanceolatis obtusis dorso parum incrassatis incanis.—Folia adulta 3″ longa, 1″ lata, petioli 2 , pedunculi 2–2½″, glans 6‴ alta, 5‴ in diametro.—Coll. Seemanni, n. 1971 in Herb. Hook. (specimina sterilia). Sierra Madre.

Obs. Planta Hartwegiana, no. 419 in Herb. Hook. et Herb. Reg. Berol. multis notis a *Q. obtusata*, H. W. K., diversa est. Specimina Seemanni sterilia folia habent angustiora ad tertiam modo partem crenato-repanda 3–3½″ longa, 8–9‴ lata.

622. Quercus *tuberculata*, Lieb., Bonpl. vol. iii. p. 38; ramulis teretibus fuscis glabris lenticel-

latis, foliis approximatis coriaceis petiolatis oblongo-obovatis obtusis repandis basi cuneatis integris margine cartilagineo parum revoluto, nervis utrinsecus 9–10 ante marginem furcatis et arcuato-anastomosantibus transverse reticulato-venulosis, subtus prominentibus, supra dilute viridibus nitidis glabris (in junioribus pilis stellatis brevibus adspersis), subtus pallidis glaberrimis, petiolis varia longitudine glabris, fructibus axillaribus sessilibus geminis v. solitariis, glande truncato-ovoidea apice umbilicato-impressa mamilla parva terminata stigmatibus 3 brevissimis, basi umbone magno notata, tenuissime puberula, cupula tertiam glandis partem obtegente depresse cyathiformi, squamis arcte imbricatis tuberculo calloso prominente dorso notatis adpresse ferrugineo-puberulis.—Folia 3–5″ longa, 1½–2″ lata, petioli 2–9‴, glans 6‴ alta et in diametro, cupula 3‴ alta, 8‴ in diametro. Gemmæ ovatæ, squamis ovatis obtusis ciliolatis ceterum glabris.—Coll. Seemanni, n. 1970 in Herb. Hook. (4 fr. !). Sierra Madre.

Obs. Forma foliorum cum *Q. Hartwegii*, Benth., et *Q. læta*, Lieb., convenit; fructibus sessilibus a *Q. læta* distinguitur, glande duplo minori a *Q. Hartwegii*.

623. Quercus *laxa*, Lieb., Bonpl. vol. iii. p. 38; ramis teretibus fuscis tomentosis, ramulis angulatis sulcatis villo flavescente dense obsitis; foliis coriaceis petiolatis obovatis apice rotundatis basi attenuatis plus minus cordato-emarginatis plus minus obliquis repandis, nervis utrinsecus 9–11 excurrentibus sæpe apiculo calloso terminatis, transverse reticulato-venulosis subtus prominentibus, supra glaucis pilis stellatis flavescentibus adspersis, subtus densius incano-tomentosis, petiolis parum compressis tomentosis, stipulis scariosis lincaribus extus adpresse pilosis, fructibus laxe et interrupte spicatis, rhachi 2–3½-pollicari flexuosa dense cavo-flavescenti-tomentosa, glande glabra utrinque truncata subglobosa apice umbilicato-impressa mamilla adpresse tomentosa terminata, basi umbone magno notata, cupula cyathiformi dimidiam glandis partem amplectente, squamis arcte imbricatis lato-lanceolatis obtusis adpresse pubescentibus scariosis.—Folia 3–4″ longa, 1½–2″ lata, petioli 3–5‴, glans 5–6‴ alta totidemque in diametro, cupula 3‴ alta, 6‴ in diametro, stipulæ 3‴ longæ, ½‴ latæ. Gemmæ ovatæ obtusæ, squamis concavis extus adpresse puberulis. Amenta mascula pollicaria, rhachi dense tomentosa, squamis involucri pilosis, antheris apice pilosis.—Coll. Seemanni, n. 1967 in Herb. Hook. Sierra Madre. Species non satis notæ, cum fructus latet.

Obs. A *Q. Hartwegii*, Benth., differt; spicis fructiferis multo longioribus, fructibus plus duplo minoribus, indumento ramulorum foliorumque, foliis apice magis rotundatis, etc.

624. Quercus *resinosa*, Lieb., Bonpl. vol. iii. p. 39; ramulis digitum minimum fere crassis rugosis cicatricatis superne villo brevi ferrugineo obsitis; foliis in apicibus ramulorum approximatis crassis coriaceis brevissime petiolatis maximis obovato-lanceolatis obtusis basi emarginatis margine undulatis grosse repandis, nervis utrinsecus 15–17 patulis rectis parallelis excurrentibus transverse et reticulato-venulosis subtus valde prominentibus, supra dilute viridibus pilis stellatis brevissimis pubescentibus, subtus densius incano-pubescentibus, costa nervis venulis propter glandulas numerosas minimas resiniferas ferrugineis, petiolis brevissimis crassis pubescentibus supra concavis; fructibus . . . . —Folia 9–12″ longa, 4–6″ lata, petioli 2‴.—Coll. Seemanni, n. 1972 in Herb. Hook. (sterilis). Sierra Madre.

Obs. Magnitudine foliorum cum *Q. macrophylla*, Née, convenit, differt vero crassitie foliorum, forma, indumento, nervis crebrioribus, petiolis crassioribus.

625. Quercus *fulva*, Lieb., Bonpl. vol. iii. p. 39; ramulis petiolis pagina inf. foliorum pilis stellatis fulvo-tomentosis, ramulis teretibus cicatricatis, foliis approximatis coriaceis petiolatis lato-obo-

vatis brevissime et abrupte acuminatis apiculatis basi rotundatis v. leviter cordatis interdum parum obliquis integerrimis v. denticulo uno alterove e nervis excurrentibus orto instructis, nervis utrinsecus 7–9, plerisque ante marginem repetite furcatis solutis uno alterove excurrente cum venulis transversis reticulatis subtus prominentibus, supra dilute viridibus secus costam nervosque pulverulentis ceterum nitidis glabris, petiolis teretibus; gemmis cylindricis elongatis (!), squamis laxe imbricatis adpresse pilosis longe ciliatis; fructibus (teneres solummodo adsunt) axillaribus subsessilibus geminis, tubo stylino e cupula exserto piloso, stigmatibus 3 recurvis, squamis cupulæ scariosis adpresse pilosis.—Folia 4–5″ longa, 2½–3″ lata, petioli pollicares, gemmæ 4‴ longæ, 1½‴ latæ.—Coll. Seemanni, no. 1973 in Herb. Hook. Sierra Madre.

Obs. Affinis videtur *Q. brachystachiæ*, Benth., sed differt foliis latioribus subintegris, indumento, fructibus subsessilibus geminis, nec spicatis, forma gemmæ!

626. Quercus *nudinervis*, Lieb., Bonpl. vol. iii. p. 39; ramulis fuscis glabris lenticellatis; foliis ad apices ramulorum brevium valde approximatis coriaceis brevi-petiolatis oblongo-obovatis v. obovato-lanceolatis apice rotundatis v. obtuse acuminatis basi cuneatis plus minus obliquis repandis margine cartilagineo, nervis utrinsecus 12–15 parallelis excurrentibus cum venulis transversis reticulatis subtus valde prominentibus, supra glauco-viridibus nitidis glabris, subtus opacis fuscescentibus inter nervos venulasque pilis stellatis brevibus adspersis, costa nervis venulisque glaberrimis, petiolis supra adplanatis, basi tumidis glabris; gemmis ovatis nitidis, squamis glabris ciliolatis; fruct. . . . . .—Folia 4–6″ longa, 2–3½″ lata, petioli 3‴.—Coll. Seemanni, n. 1457 in Herb. Hook. (sterilis). Cerro de Pinal.

Obs. Foliorum forma cum *Q. circinatæ*, Née, convenit.

627. Quercus *cuneifolia*, Lieb., Bonpl. vol. iii. p. 39; ramulis teretibus glabris atropurpureis; foliis approximatis membranaceis magnis brevi-petiolatis lanceolatis cuneatis obtuse acuminatis ad mediam v. parum infra medium profunde dentatis, dentibus utrinsecus 5–6 lato-ovatis, obtusis basi longe attenuatis cuneatis, nervis utrinque 9–10 partim excurrentibus partim ante marginem arcuato-anastomosantibus cum venulis transversis reticulatis subtus prominentibus, utrinque glaberrimis, petiolis glabris supra planis, stipulis setaceis, parvis deciduis; fruct. . . . .—Folia 7–10″ longa, 2½–4″ lata, petioli 2–3‴, stipulæ 1½‴.—Coll. Seemanni, n. 1456 in Herb. Hook. (sterilis). Cerro de Pinal.

BETULACEÆ.

628. Alnus *arguta*, Schlecht., Spach, Ann. Scienc. Nat. ser. 2. vol. xv. p. 205. Sierra Madre (n. 1965 !).

SALICINEÆ.

629. Salix *microphylla*, Schlecht., Hook. et Arn. Bot. Beech. p. 310. tab. 70. Tepic (Lay and Collie !).

CONIFERÆ.

630. Juniperus *tetragona*, Schlecht., Endl. Synop. Conif. p. 29.—Nomen vernacul. "Tascate." Common on the table-land of Durango, in sunny, exposed places.

Hartweg found it between Mineral del Monte and Chico (Hartweg. n. 436).

631. Chamæcyparis *thurifera*, Endl. Synop. Conif. p. 62.—*Cupressus thurifera*, H.B. et K., Nov. Gen. et Sp. vol. ii. p. 3.—Nomen vernacul. "Cedro de la Sierra." On the banks of rivulets near Guadalupe, in the Sierra Madre; also between Mesquital and Tepic.

632. Taxodium *distichum*, Rich., Endl. Synop. Conif. p. 68.—*Cupressus disticha*, Linn. Spec. 1422.—Nomen vernacul. "Sabino." On the banks of rivers and rivulets, common on the table-land of the State of Durango.

This tree, called by the modern Mexicans "Sabino," by the Aztecs "Ahoehoetl," and by the inhabitants of the United States Black, Bald, or Swamp Cypress, always grows near rivers or running streams, and except it and the Cedro de la Sierra (*Chamæcyparis thurifera*, Endl.), I do not know any *Conifera* which is so closely confined to them as this one. Often have I rejoiced when, after searching a long time for water, the tops of some Sabinos were descried: I had found the object of my search. The Sabino is diffused over the whole table-land of Mexico; it was collected at Misteca Alta (Galeotti, n. 5!), St. Maria de Tule, Oaxaca (Liebmann!), and at some other place not specified (Jürgensen, n. 237); it was besides found in Texas (Lindheimer, n. 181!), in Louisiana (Drummond, n. 322!), Alabama (Drummond!), Florida (Herb. Hook.!), and in various other States of the North American Republic.

Dr. Bennet Dowler, of New Orleans, from an investigation of the successive growths of Cypress forests around that city, the stumps of which are still found *at different depths, directly overlying each other*, from the great size and age of these trees, and from the remains of Indian bones and pottery found below the roots of some of these stumps, arrives at the conclusion "that the human race existed in the delta of the Mississipi more than 57,000 years ago, and that ten subterranean forests, and the one now growing, will show that an exuberant flora existed in Louisiana more than 100,000 years anterior to these evidences of man's existence."

633. Pinus (Abies) *religiosa*, H.B. et K., Nov. Gen. et Sp. vol. ii. p. 5.—*P. hirtella*, H.B.K., l.c.!—Nomen vernacul. "Oyamel." Sierra Madre, on the road from Durango to Mazatlan.

On comparing my specimens of *Pinus hirtella*, H.B.K., from the Sierra Madre, with those named *P. religiosa* in the herbaria of Hooker and Bentham, I observed that the latter too, without exception, had *hirtellous* branches; and again, on examining specimens of *P. religiosa* growing in the Royal Botanic Gardens of Kew, as well as at various other horticultural establishments, I found that they did not differ in any way from those of *hirtella* collected by myself. As the only difference between *P. religiosa* and *P. hirtella* insisted upon by writers on *Coniferæ* consists in the former having glabrous, the latter hirtellous branches, I was forced to conclude that all the specimens of *P. religiosa* which I had seen in England ought to be called *P. hirtella*, unless it could be shown that *P. religiosa* had (notwithstanding Humboldt's, Bonpland's, and Kunth's assertion to the contrary) hirtellous branches. In order to ascertain this point, I addressed a letter on the subject to Mr. George Gordon, at the Horticultural Society's Gardens at Chiswick, a gentleman of great practical experience, who, under date of Chiswick, November 11, 1854, kindly replied, that "having taken a good deal of interest and pains in the matter, when Mr. Hartweg was collecting in Mexico, and begged him to examine minutely Humboldt's and Bonpland's localities, to see what their *A. hirtella* was, he did so, but could discover no other species than the 'Oyamel,' or *Abies religiosa*, which he carefully examined in various places between 15° and 22° S. lat., and ascertained its chief range to be about 19°, and at an elevation of 9000 feet; he also found it on the 'Campanario,' the highest point of the mountains of Angangues, 5 or 6 feet in diameter, and 150 feet high, at other places very much smaller and stunted, but still the same species; now, after carefully examining all these facts, I, as well as Hartweg, came to the decided conclusion that both names, *P. hirtella* and *P. religiosa*, belong to the same species, and that the error of making two species arose from describing imperfect specimens, and not having cones of *A. hirtella* to compare with the 'Oyamel' of the Mexicans."

Finding that Mr. Gordon's opinion coincided so entirely with my own, in order to settle the point definitively, I requested my friend Dr. Charles Bolle, at Berlin, to examine Humboldt and Bonpland's original specimens of *P. religiosa*, and to ascertain whether they had glabrous or hirtellous branches. In a letter from that botanist, dated Berlin, Nov. 24, 1854, he says:—"I congratulate you upon your power of divination, for the authentic specimens of *P. religiosa* in the Royal Herbarium have certainly hirtellous branches." We may therefore conclude that *P. religiosa* and *P. hirtella* are identical, and consider the difference thought to exist between them as entirely attributable to imperfect descriptions. Now, as the names were both given at the same time, it becomes a question which of the two ought to be adopted. The name *hirtella* might appear the most appropriate, as indicating a botanical character; but as that of *religiosa* is so much more diffused, and as the plant is used in Mexico, on account of its elegant branches, for ornamental purposes on religious festivities, I determine in favour of the latter name.

634. Pinus (Pseudo-Strobus) *oocarpa*, Schied., Endl. Synop. Conif. p. 152.—*P. radiata*, Hook. et Arn. Bot. Beech. p. 392, non Don.—Nomen vernacul. "Pino Real." Cerro de Pinal; Tepic (Sinclair!); Chihuahua (Potts! Gregg, n. 628 *a*!).

635. Pinus (Pseudo-Strobus) *leiophylla*, Schied. et Depp., Endl. Synop. Conif. p. 155. Common between Cayotes and Rio Chico, on the road between Durango and Mazatlan.

My guides called this tree "Pino prieto" (*i.e.* Black Pine), but I do not know whether that name is universally in use.

636. Pinus (Tæda) *patula*, Endl. Synop. Conif. p. 157.—Nomen vernacul. "Pino Pinavete?" Between Mesquital and Santa Teresa.

637. Pinus (Pinea) *cembroides*, Zucc., Endl. Synop. Conif. p. 182.—Nomen vernacul. "Pino Piñon." Common between Durango and Rio Chico.

This tree was met with by Hartweg (n. 440) and Gregg (n. 52); its seeds are sold in the shops of Durango as an article of food, and under the name of "Piñones."

Another Pine, called "Ocote" by the natives (perhaps *Pinus* [*Tæda*] *Teocote*, Cham. et Schl.), of which pitch is made, was observed by me in the Sierra Madre, near the settlement of Ocote, but no specimens of it were procured. *Cupressus fastigiata*, De Cand., is cultivated for ornamental purposes at the city of Durango.

PALMÆ.

638. Cocos *nucifera*, Linn., Kth. Enum. vol. iii. p. 285. Common on the western coast, as far as the entrance of the Gulf of California.

An arborescent Fan-Palm was seen by me at the town of San Sebastian, but the specimens of it were lost.

PISTIACEÆ.

639. Pistia *Stratiotes*, Linn. Zeyl. n. 322. In swamps; common on the coast region.

MUSACEÆ.

640. Musa *sapientum*, Linn. Syst. Veg. (edit. Pers.), p. 943.

Succeeds well in the lower coast region, but never bears fruit at Durango, where it is cultivated for its ornamental foliage.

ORCHIDACEÆ.

641. Stenorrhynchus (Bivesica) *Madrensis*, Rchb. fil. mss. in Seem. Bonpl. vol. iii. p. 177; caule ultrapedali glaberrimo vaginato, vaginarum arctarum laminis liberis lanceolatis acuminatis ostium vaginæ superioris attingentibus, spica pluriflora densa quaquaversa apice comosa (alabastris summis nondum expansis), bracteis ab ovato basi cuspidatis flores excedentibus extus dense breviterque pilosis, ovario doliiformi puberulo abbreviato, sepalis oblongis acutis, lateralibus basi dilatatis, omnibus extus puberulis, sepalis paullo brevioribus obtusiusculis aut subacutis omnibus obscurioribus nervis pictis, labello breviter unguiculato panduræformi acuto intus varicose albo-papilloso, rostelli semirhombei dente cuspidato.—*Neottiæ sulphureæ*, La Llave, affinis, quæ videtur distare spica secunda, floribus diverso sensu contortis, bracteis acutis apice nigricantibus, perigonio urceolato. Inter inextricabiles Richardianas Spiranthides exstare non videtur. Sierra Madre, Mexici, 7000 supra mare. (Seemann, no. 1958!)

BROMELIACEÆ.

642. Achmæa *laxiflora*, Benth. Bot. Sulph. p. 173. Acapulco (Barclay!).

643. Ananassa *sativa*, Lindl. Bot. Reg. n. 1068. t. 1081.—Nomen vernacul. "Piña." Cultivated.

644. Tillandsia *usneoides*, Linn. Syst. Veg. (edit. Pers.) p. 333; Beer, Bromeliaceen, p. 151. Talisco (Lay and Coll!ie).

COMMELYNACEÆ.

645. Commelyna *agraria*, Kth. Enum. vol. iv. p. 38. San Blas; Acapulco (Barclay!).

646. Commelyna *acuminata*, H. B. K.—Kth. Enum. vol. iv. p. 38. Between San Blas and Tepic (Barclay!).

ERIOCAULEÆ.

647. Eriocaulon *Benthami*, Kth. Enum. vol. iii. p. 545.—*E. microcephalum*, Hook. et Arn. Bot. Beech. p. 311, non H. B. K. Swampy places, Tepic (Barclay!).

GRAMINEÆ.

648. Pennisetum *purpurascens*, H. et Kth.—Kth. Enum. vol. i. p. 160. Acapulco (Barclay!).

The Indian Corn is cultivated extensively throughout the region.

FILICES.*

(*Auctore J. Smith.*)

649. Elaphoglossum *longifolium*, J. Sm.—*Acrostichum*, Jacq., Willd. l. c. p. 105 (Plum. Fil.

* To make this list of Mexican Ferns more complete, a set collected by Mr. W. Schaffner (now residing at Mazatlan) in the Southern States, has been incorporated with those collected by Dr. Seemann.—*J. Smith.*

t. 135).—*Olfersia longifolia*, Presl, Pterid. p. 234! Sierra Madre (n. 1939). Common throughout tropical America and the West Indian Islands, varying much in size and aspect.

The present specimens are small and imperfect, but they appear to me to be only a state of the above.

650. Elaphoglossum *simplex*, Schott, J. Sm. in Hook. Gen. Fil. t. 105 A.—*Acrostichum simplex*, Sw. Southern Mexico (Schaffner!). Common through tropical America and the West Indian Islands, varying much in size, and more or less furnished with squamæ.

Presl, in his 'Tentamen Pteridographiæ,' places the simple-fronded *Acrostichæ* with free veins under *Olfersia* of Raddi, a genus founded on a pinnate-fronded Fern, which, with its ally *Olfersia cervina*, differs entirely in general character from the species constituting *Elaphoglossum*. In a latter work ('Epimeliæ Botanicæ') he restricts *Olfersia* to Raddi's original species (*O. Corcovadensis*), and constitutes a new genus of *O. cervina*, which he characterizes under the name of *Dorcapteris*, the only apparent distinguishing character being that the fertile pinnæ of *O. Corcovadensis* are linear and entire, those of *O. cervina* sinuose-pinnatifid; but as I have witnessed more than once the production of both kinds of fronds growing at the same time on one and the same plant in the Royal Gardens at Kew, it is evident that, instead of two genera, there is only one species, and that consequently Presl's genus *Dorcapteris* must be set aside.

651. Rhipidopteris *peltata*, Schott, supra, p. 232. Near Orizaba (Schaffner!). West Indian Islands and tropical America.

652. Polypodium *pectinatum*, L., Willd. Spec. Plant. vol. v. p. 180.—Schk. Fil. t. 17. Sierra Madre (n. 1936). Tropical America and the West Indian Islands generally.

This varies much in size, and in being smooth or more or less villose, in consequence of which some of the different states have been described as distinct species. The specimens in this collection are small, and agree best with Schkuhr's figure, as also with specimens from Brazil named *Polypodium Schkuhrii*, by Raddi; but, setting aside size, I know not how to distinguish them from the states called *P. Otites* and the usual typical forms (identified by a specimen in the Linnean Herbarium) of *P. pectinatum*.

653. Polypodium *Madrense*, J. Sm. (Tab. LXXIII.); frondibus stipitatis oblongo-ovatis profunde pinnatifidis coriaceis opacis, sinubus rotundatis, laciniis linearibus obtusis, margine integerrimo incrassatis, venis immersis obscuris bifurcatis, venulis liberis inferioribus fertilibus, soris globosis uniserialibus subconfluentibus, stipite rachibusque subtus squamiferis.—Rhizoma squamosum; stipitis basis nodoso-articulata; frondes 6–12 uncias altæ, laciniæ 1 unciam longæ, 2 uncias latæ, siccatæ supra involuto-circinatæ. Sierra Madre.

This differs from any previous described species; its nearest relationship is with *Polypodium vulgare*, from which it differs in being squamose, and in the margin of the laciniæ being entire and thickened; it is also related to another Mexican species, *Polypodium plebejum* of Schlechtendal, but the specimens I have seen of that do not appear to differ much from those of *Polypodium vulgare*. In the herbarium *Polypodium Madrense* is readily known by the laciniæ being circinately rolled up, the effect of a hygrometric property peculiar to this species, and apparently caused by the different contracting power of the thickened margin and disc of the laciniæ.

Plate LXXIII. Fig. 1, a lacinia, showing the under side bearing sori; 2, a portion of the same, showing the position of the sori on the lower venule; 3, upper side of ditto; 4 and 5, sporangia; 6, spores:—*all magnified*.

654. Lepicystis *sepulta*, J. Smith, supra, p. 230. Sierra Madre (n. 1933). Tropical America generally.

The natural group to which *Lepicystis* belongs includes *Pleopeltis*, and several species of squamiferous

Polypodieæ, with free or partially anastomosing veins. On taking a general view of this group, it appears to me very questionable whether the difference in venation is of sufficient importance to justify the separation of species so closely allied in general habit.

655. Pleopeltis *lanceolata*, Presl, Pterid. p. 193.—J. Sm. Gen. Fil. l. c. p. 59.—*Polypodium lanceolatum*, L., Willd. l. c. p. 153 (Plum. Fil. t. 137).—*Polypodium macrocarpum*, Willd., l. c. p. 147.—*Pleopeltis*, Presl, l. c.—J. Sm. l. c.—Kaulfuss, En. Fil. p. 245.—*Pleopeltis Helenæ*, Presl, l. c. Sierra Madre (n. 1945).

Very generally distributed throughout tropical America and the West Indian Islands; also found in St. Helena, Madagascar, the Indian Peninsula, and Juan Fernandez.

656. Ctenopteris *delicatula*, J. Sm.—*Polypodium delicatulum*, Mart. et Gal., Mex. Fil. p. 35. t. 7. f. 1.—Fée, Gen. Fil. p. 235. Near Guajimalpa, on trees in humid forests (Schaffner!).

657. Xiphopteris *serrulata*, Kaulf. En. Fil. p. 85.—Fée, Gen. Fil. p. 100.—*Grammitis serrulata*, Sw. Near Huatusco (Schaffner!).

Tropical America and West Indian Islands generally.

658. Gymnogramme *Calomelanos*, Kaulf. supra, p. 228. Foot of the Cerro de Pinal, in woods.

Very generally spread over tropical and extratropical America and the West Indian Islands. Varies much in the ultimate segments being obtuse or acute, and more or less inciso-dentate, rendering it impossible to say whether the whole are forms of one or more species; the same remark is equally applicable to the species with yellow farina.

659. Gymnogramme *pedata*, Kaulf. l. c. p. 69.—*Hemionitis pedata*, Sw. Syn. Fil. pp. 20 et 209. t. 1. f. 3.—*Neurogramme pedata*, Lk. En. Fil. Hort. Berol. p. 139 (1841).—Fée, Gen. Fil. p. 169. Sierra Madre (n. 1937).

This is a rare Fern, for, although described and figured long since by Swartz, and even cultivated in the Berlin Botanic Garden in 1833, from whence I received a specimen, its native locality does not seem to have been exactly known until discovered by Dr. Seemann; the present are the first native specimens I have seen.

660. Llavea *cordifolia*, Lag. Gen. et Sp. Plant. p. 33 (1816).—*Ceratodactylis osmundoides*, J. Sm. in Hook. Gen. Fil. t. 36.—Journ. Bot. vol. iv. p. 48.—Fée, Gen. Fil. p. 228.—*Allosorus Karwinskii*, Kunze in Linn. vol. xiii. p. 138.—Schk. Fil. Suppl. t. 4.—Mart. et Gal. Fil. Mex. p. 47.—*Botryogramme Karwinskii*, Fée, Gen. Fil. p. 166. t. 15. l. c. Mexico (Karwinsky, Hartweg, Liebold, Galeotti).

In habit this genus differs entirely from *Allosorus*, its natural affinity being with *Coniogramma* of Fée, a genus founded on *Gymnogramme Javanica* and *serrulata* of Blume, from which *Llavea* differs in having the upper portion of the frond contracted into fertile siliquæform segments, including the sporangiæ, while the fertile segments in *Coniogramma* are plain, the sporangiæ occupying nearly the whole length of the veins, forming naked, linear sori.

661. Hemionitis *palmata*, L., Willd. l. c. p. 129.—J. Sm. Gen. Fil. l. c. p. 69. Sierra Madre (n. 1938). West Indian Islands.

662. Hemionitis *hederæfolia*, J. Sm.; frondibus longe stipitatis cordatis quinquelobis rufo-tomentosis, lobis integerrimis, inferioribus minoribus, stipitibus glabris nitidis teretibus; vernatiis

sarmentosis brevibus squamosis epigæis.—Stipites 8–9 uncias longæ, lobæ 2–3 uncias longæ. Mexico: Liebold (J. Smith, Herb. 1843).

Although the palmate character of the frond of this species does not differ much from *H. palmata*, still its different mode of growth clearly indicates its being a distinct species. In *H. palmata* the axis of vernation consists of a small erect cormus, formed of fasciculate fronds, whereas in *H. hederæfolia* the axis is a decumbent short squamose sarmentum; it also differs in the stipes being perfectly smooth and ebeneous.

663. Notholæna *sinuata*, Kaulf. l. c. p. 135.—J. Sm. Gen. Fil. l. c. p. 50.—*Notholæna lævis*, Mart. et Gal., Fil. Mex. p. 46. Sierra Madre, on rocks (nos. 1928, 1935); Chapultepic (Schaffner!).

No. 1928, pinnæ entire. No. 1935, pinnæ sinuose.—v. v. Hort. Kew.

In *N. lævis* of Martens and Galeotti the pinnæ are entire, but intermediate states show that *N. lævis* and *N. sinuata* are the extreme forms of one species only.

664. Notholæna *rufa*, Presl, Rel. Hænk. p. 19.—J. Sm. Gen. Fil. l. c. p. 50. Sierra Madre, on rocks (n. 1942–1943); Chapultepic (Schaffner!).—v. v. Hort. Kew.

665. Myriopteris *myriophylla*, J. Sm.—*Cheilanthes myriophylla*, Desv., Hook. Sp. Fil. vol. ii. p. 100. t. 105 A.—*Myriopteris paleacea*, Fée, Gen. Fil. p. 149.—*Cheilanthes paleacea*, Mart. et Gal., l. c. p. 76. t. 21. f. 2.—Supra, p. 233. Southern Mexico (Schaffner!). Cordillera of the Andes of Mexico and Peru.

About eighty species of *Cheilanthes* are described by Sir William Hooker in his 'Species Filicum,' where he says, "Vain is the attempt to form a definite character which shall decide the limits of this genus." With this I perfectly agree, as long as the technical character of the genus is made to depend entirely upon the form of the sori and indusium. In the species typical of true *Cheilanthes* the indusium is formed on a reflexed crenule, and is more or less distinctly reniform, containing a single cluster of sporangia in its axis; but in many species referred to *Cheilanthes* more or less of the margin is reflexed and indusoid, containing two or more clusters of sporangia in its axis, which in some species are so contiguous as to have the appearance of being continuous, and apparently not differing from the technical character of *Pteris*. Like other extensive genera, the species are capable of being separated so as to form natural groups, some of which are so very distinct from one another in general habit that they seem to have no natural relationship, and if it was not for the apparent sameness in their mode of fructification, they would hardly be supposed to belong to the same genus. It is therefore not surprising that Pteridologists have taken different views, some retaining the whole under *Cheilanthes*, while others place certain species under different genera. As regards the group to which the present and following species belong, M. Fée raises them to the rank of a genus, named by him *Myriopteris*, which I have adopted.

666. Myriopteris *Lindheimeri*, J. Sm.—*Cheilanthes Lindheimeri*, Hook. Sp. Fil. vol. ii. p. 101. t. 107 A. Sierra Madre (n. 1934).

667. Cheilanthes *viscosa*, Link, Fil. Hort. Reg. Berol. p. 66.—Hook. l. c. vol. ii. p. 104. t. 93 B. Sierra Madre (n. 1944, *β minor*, Hook. l. c.).—v. v. Hort. Kew.

668. Cheilanthes *microphylla*, Sw. Syn. Fil. p. 127.—Hook. l. c. vol. ii. p. 84. t. 98 A.—Sierra Madre (n. 1931). On rocks near Belen, Tacubaga (Schaffner!).

West Indies and tropical America.—v. v. Hort. Kew.

669. Cheilanthes *Seemanni*, Hook. l. c. vol. ii. p. 85. t. 97 A. Sierra Madre.

670. Cheilanthes *cuneata*, Link, l. c. p. 63.—Kunze in Schk. Fil. pp. 73, 6, 36.—Hook. l. c. p. 107. excl. syn. Mart. et Gal. Sierra Madre (n. 1932); Cerro de Pinal (n. 1450).

671. Allosorus *marginatus*, J. Sm.—*Cheilanthes marginata*, H.B.K., Nov. Gen. et Spec. Am. vol. vii. t. 669.—Link, Fil. Hort. Berol. p. 62.—Hook. Sp. Fil. vol. ii. p. 106.—*Cheilanthes chærophylla*, Mart. et Gal., Fil. Mex. p. 47. t. 11.—*Allosorus ciliatus*, Presl, Reliq. Hænk. vol. i. p. 59. Near Guajimalpa, Toluca (Schaffner !). Andes of Mexico and Peru generally.

The habit and general character of this and the following species agree so well with the typical species of the genus *Allosorus* (*A. crispus*), that I have no hesitation in placing them in that genus. *A. crispus* has an extensive geographical range in the temperate regions of the northern hemisphere; for, according to my view, the North American *A. acrostichoides* and the Himalayan *A. Brunoniana* are only forms of the *A. crispus* of Europe, produced by climatal influences, and it is probable that the examination of specimens from the latitudes intervening between the limit of *A. acrostichoides* and the southern limit of the Mexican species will show that the whole are merely modifications of one species.

672. Allosorus *angustifolius*, Presl, Pterid. p. 152.—*Cheilanthes angustifolia*, H.B.K. Gen. et Spec. Am. vol. i. p. 17.—*Onychium angustifolium*, Kunze in Schk. Fil. p. 11.—*Allosorus decompositus*, Mart. et Gal., l. c. p. 48. t. 10. f. 2. Sierra Madre (n. 1927).

673. Plecosorus *Mexicanus*, Fée, Gen. Fil. p. 151. t. 13. f. 1.—*Cheilanthes speciosissima*, Kunze, Analect. Pterid. p. 35. t. 23.—Linn. vol. xiii. p. 145.—Hook. Sp. Fil. vol. ii. p. 103. Near Chapultepic (Schaffner !); Real del Monte (Hartweg).

The large size and squamose character of this Fern gives it the appearance of being more closely related to *Polystichum* (*P. aculeatum*) than to the genus *Cheilanthes*, from which it differs in the sporangia being produced longitudinally on the venules, which, with the involute indusæform margin, induced me to note on my first specimen that it was analagous to *Jamesonia*, but as it differs in habit from that genus as much as it does from *Cheilanthes*, I therefore deem it best to follow M. Fée in considering it the type of a distinct genus.

674. Pellæa *sagittata*, Link, En. Fil. Hort. Berol. p. 60.—Fée, Gen. Fil. p. 129.—*Allosorus sagittatus*, Presl, Kunze in Schk. Fil. Suppl. t. 29.—*Platyloma sagittata*, J. Sm. Gen. Fil. l. c.—*Allosorus cordatus*, Presl, Hook. in Bot. Mag. t. 4698.—*Platyloma cordata*, J. Sm. l. c.—*Pteris sagittata* et *cordata*, Cav., Willd. l. c. p. 292. On rocks near Belen, Chapultepic, and Tacubaga (Schaffner !)

For a long time I considered *P. sagittata* and *P. cordata* to be two distinct species; but the examination of a greater number of specimens has now convinced me that the different appearances are only modifications of one species.

675. Pellæa *flexuosa*, Link, l. c. p. 60.—Fée, Gen. Fil. p. 129.—*Allosorus flexuosus*, Presl, Kunze in Schk. Fil. Suppl. t. 23.—Hook. Ic. Pl. Rar. t. 119. Sierra Madre (n. 1940). On rocks about Tacubaga, Belen, and Chapultepic (Schaffner !).

The scandent character of the frond and the refracted pinnæ readily distinguish this from the preceding species.

676. Pellæa *ternifolia*, Link, l. c. p. 59.—Fée, Gen. Fil. p. 129.—*Pteris ternifolia*, Cav., Hook. et Grev. Ic. Fil. t. 126.—*Pteris subverticillata*, Sw., Willd. l. c. p. 375.—*Allosorus subverticillatus*, Presl, Pterid. p. 153. Near San Angel, Belen, on rocks (Schaffner !).

I originally considered the preceding three species as belonging to my genus *Platyloma*, with which they agree in the character of the sori; but on revising the genus I find them to differ so much in habit and mode of growth from true *Platyloma* (*P. Brownii, P. falcata, P. rotundifolia*), that I deem it best to separate them, and adopt Link's genus *Pellæa*, to which also is referred *Pteris atropurpurea*, Linn., *P. hastata* and *Calomelanos*, Sw., and *P. geranifolia*, Raddi, thus forming a very natural genus.

677. Adiantum *Capillus-Veneris*, Linn., Willd. l. c. p. 449.—Hook. l. c. p. 36.—*A. tenerum*, var. *dissectum*, Mart. et Gal. l. c. p. 71. Near Tacubaga, on a brook (Schaffner!) Very universally diffused throughout both hemispheres.

678. Adiantum *lobatum*, Presl, Reliq. Hænk. p. 62. t. 10. f. 3.—Hook. Spec. Fil. vol. ii. p. 10. Sierra Madre (n. 1947).

679. Adiantum *patens*, Willd. Sp. Plant. vol. v. p. 439.—Hook. Sp. Fil. vol. ii. p. 29. t. 87 A. Sierra Madre (n. 1949); Cerro de Pinal.

680. Adiantum *concinnum*, Humb. Nov. Gen. et Sp. Am. t. 668.—Willd. l. c. p. 451.—Hook. l. c. vol. ii. p. 42.—*A. affine*, Mart. et Gal. l. c. p. 70. Sierra Madre (n. 1946).

681. Pteris *aquilina*, Linn., Willd. l. c. p. 402.—§ *Ornithopteris*, Agard. Monog. Pteridis, p. 45. Sierra Madre (n. 1903).

682. Blechnum *occidentale*, Linn., Willd. l. c. p. 412.—*B. cartiligineum*, Schk. Fil. t. 108 *b*. Supra, p. 235. Tepic (Lay and Collie!).

683. Woodwardia *radicans*, Sw., Willd. l. c. p. 418.—Hook. Gen. Fil. t. 17. Sierra Madre, in ravines (n. 1929). Tepic (Lay and Collie!); Nepal, California, Mexico.

684. Neottopteris *nidus*, J. Sm. in Hook. Gen. Fil. t. 113 B.—Fée, Gen. Fil. p. 203.—*Thamnopteris nidus*, Presl, Epim. Botanicæ, p. 68.—*Asplenium nidus*, Linn., Willd. l. c. p. 303. Tepic (Lay and Collie!); Tropics generally.

685. Asplenium *subulatum*, Hook. et Arn. Bot. Beech. p. 312. t. 71. Tepic (Lay and Collie!).

686. Asplenium *monanthemum*, Linn., Willd. l. c. p. 322.—Mart. et Gal. l. c. p. 57. In woods near Guajimalpa (Schaffner!).

687. Cystopteris *fragilis*, Bernh., Hook. Spec. Fil. vol. i. p. 198.—*Athyrium fumarioides*, Presl, Reliq. Hænk. p. 39. t. 6. f. 2.—*Aspidium fragile*, Mart. et Gal. l. c. p. 67. On the brook between Tacubaga and Belen (Schaffner!).

688. Woodsia *mollis*, J. Sm., Gen. Fil. l. c.—Hook. Spec. Fil. vol. i. p. 60.—*Woodsia Mexicana*, R. Br. in Wall. Pl. Asiat. p. 42 (note).—*Physematium molle*, Kunze, Anal. Pterid. p. 41. t. 27. Near Belen, Santa Fé (Schaffner!).

689. Lastrea *patens*, Presl, Pterid. p. 75.—*Aspidium patens*, Sw., Willd. l. c. p. 244 (excl. syn. *A. nymphale*, Schk.). On the banks of the rivulet between Tacubaga and Belen (Schaffner!). Very generally distributed throughout the West Indies and tropical America.

690. Lastrea *arguta*, J. Smith, supra, p. 238. Sierra Madre (n. 1948).

691. Nephrolepis *exaltata*, Schott, Gen. Fil. t. 3.—J. Sm. Gen. Fil. l. c.—*Aspidium exaltatum*, Willd. l. c. p. 229. Tepic (Lay and Collie!); West Indies and tropical America generally.

692. Trichomanes *sinuosum*, Rich., Willd. l. c. p. 502.—Hook. et Grev. Ic. Fil. t. 13.—Hook. Spec. Fil. vol. i. p. 120. Near Orizaba (Schaffner!).

693. Trichomanes *trichoideum*, Sw., Willd. l. c. p. 509.—Hook. et Grev. Ic. Fil. t. 199.—Hook. Spec. Fil. vol. i. p. 141. Near Orizaba (Schaffner!).

694. Trichomanes *quercifolium*, Hook. et Grev. Ic. Fil. t. 115.—Hook. Spec. Fil. vol. i. p. 120. Near Orizaba (Schaffner!).

695. Trichomanes *pyxidiferum*, Linn., Willd. l. c. p. 503.—Hook. et Grev. Ic. Fil. t. 206.—Hook. Spec. Fil. vol. i. p. 124. Near Orizaba (Schaffner!).

696. Trichomanes *radicans*, Sw., Willd. l. c. p. 513.—Hook. Spec. Fil. vol. i. p. 125. Orizaba, scarce (Schaffner!).

697. Hymenophyllum *polyanthos*, Sw., Willd. l. c. p. 531.—Hook. Spec. Fil. vol. i. p. 106.—*Hymenophyllum Jalapense*, Schlecht. in Linn. vol. v. p. 619. Near Orizaba (Schaffner!).

698. Hymenophyllum *hirsutum*, Sw., Willd. l. c. p. 517.—Hook. et Grev. Ic. Fil. t. 84.—Hook. Spec. Fil. vol. i. p. 88. Near Orizaba (Schaffner!).

699. Hymenophyllum *axillare*, Sw., Willd. l. c. p. 532.—Hook. et Grev. Ic. Fil. t. 124.—Hook. Spec. Fil. vol. i. p. 111. Near Huatusco, on the trunks of trees (Schaffner!).

700. Mertensia *glauca*, Sw., Willd. l. c. p. 75.—*Gleichenia glauca*, Hook. Spec. Fil. vol. i. p. 4. t. 3 B. Sierra Madre (n. 1926).

701. Anemia *collina*, Rad. Bras. Fil. p. 71. t. 12.—Presl, Suppl. Tent. Pterid. p. 86. Sierra Madre (n. 1951).

702. Marattia *alata*, Sm., Willd. l. c. p. 66. Sierra Madre; Jamaica, St. Vincent, Sandwich Islands.

The examination of various specimens induces me to consider that *M. alata* and *lævis* of Smith are only different states of one species.

703. Osmunda *regalis*, Linn., Willd. l. c. p. 97. Sierra Madre (n. 1950).

LYCOPODIACEÆ.

(*Auctore J. Smith.*)

704. Selaginella *rupestre*, Spring, Lycop. vol. ii. p. 55.—*Lycopodium rupestris*, Linn., Willd. l. c. p. 30.—Schk. Fil. t. 165. On rocks near Villa de Nuestra Señora de Guadalupe (Schaffner!).

This is a wide-spread species, being found throughout Asia, from Siberia and Kamtchatka to Hindostan and Ceylon, and in America from Unalaska in the north to Buenos Ayres in the south; also in South Africa.

705. Selaginella *lepidophylla*, Spring, l. c. p. 72.—*Lycopodium lepidophyllum*, Hook. et Grev. in Bot. Misc. vol. iii. p. 106.—Hook. Ic. Pl. t. 162.—*Lycopodium circinale*, Mart. et Gal. l. c. p. 10. —Nomen vernacul. "Siempreviva." Sierra Madre.

706. Selaginella *cuspidata*, Link, En. Fil. Hort. Berol. p. 158.—Spring. l. c. p. 66.—*Lycopo-*

dium circinale, Schlecht. in Linn. vol. v. p. 622.—Nomen vernacul. "Doradilla" et "Flor de piedra." Valley of Mexico (Schaffner!).

707. Lycopodium *tenue,* Humb. et Bonpl. in Willd. l. c. p. 55.—Spring. l. c. p. 48.—*L. fontinaloides,* Spring, l. c. vol. i. p. 49, et Mart. et Gal. l. c. p. 8. Near Orizaba (Schaffner!).

708. Lycopodium *passerinoides,* Humb. et Bonpl. in Kunth, Nov. Gen. et Spec. vol. i. p. 41.—Spring. l. c. p. 33.—*L. nitens,* Schlecht. in Linn. vol. v. p. 623.—Spring. l. c. p. 34. Near Orizaba (Schaffner!).

709. Lycopodium *reflexum,* Lam., Willd. l. c. p. 52.—Spring. l. c. p. 25. Near Orizaba (Schaffner!).

710. Lycopodium *aristatum,* Humb. et Bonpl. in Willd. l. c. p. 17.—Spring. l. c. p. 92. Near Orizaba (Schaffner!).

711. Lycopodium *cernuum,* Linn., Willd. l. c. p. 30.—Spring. l. c. p. 79. Near Orizaba (Schaffner!).

MARSILEACEÆ.

(*Auctore J. Smith.*)

712. Marsilea *quadrifolia,* Linn., supra, p. 244. In swamps near Chapultepic (Schaffner!).

713. Marsilea *vestita,* Hook. et Grev. Ic. Fil. p. 159. Talisco (Lay and Collie!).

MUSCI.

(*Auctore W. Wilson.*)

714. Trichostomum *stenocarpum,* Wils., mss.—Monoicum; caule longiusculo; foliis falcato-secundis, e basi lanceolata lineari-subulatis, canaliculatis, apice subserrulatis, nervo lato celluloso; capsula subcylindrica, erectiuscula, operculo conico-subulato. Sierra Madre (Seemann, n. 1925).

Allied to *T. pallidum*, distinguished by the narrow elongated capsule, and by the lax texture of the leaves, the broad nerve being formed of a single layer of cellules, as in *Campylopus.* Male flower gemmiform, axillary. Calyptra longer than the capsule.

715. Fumaria *hygrometrica,* Hook. et Tayl. Musc. Brit.—Bridel, Br. Univ. vol. ii. p. 51.—Var. *calvescens,* Schwægr.—Bridel, Br. Univ. vol. ii. p. 53.

716. Physcomitrium *pyriforme,* Bridel, Br. Univ. vol. i. p. 98. Sierra Madre.

LICHENES.

(*Auctore Churchill Babington.*)

717. Usnea *barbata,* Fries, Sched. Crit. vol. ix. p. 34. Cerro de Pinal, on Oak-trees, fertile.

These specimens belong to the normal form (*U. florida,* Auct.); one of them has stiff ascending fibrillæ, thus approaching the form which Persoon styles *U. strigosa.* Eschweiler has boldly reduced most

of the supposed species of this genus into one, and we are much inclined to coincide with his view. The present species is a cosmopolite.

718. Roccella *fuciformis*, Ach. Univ. p. 440. Mazatlan, fertile.

Whether *R. fuciformis* be distinct from *R. tinctoria* is still a disputed point. So far as I can judge from a pretty numerous suite of specimens from most of the warmer parts of the world, I should be inclined to unite them, for intermediate specimens are numerous; on the other hand, those who are acquainted with them in a living state for the most part regard them as distinct, and it seems that the *sap* of *R. tinctoria* is deep yellow, whereas that of *R. fuciformis* does not stain the fingers.—(See Rev. T. Salwey on the Cryptogamic Flora of Guernsey, Edinb. Bot. Soc. Trans. vol. iii. p. 74.)

SUPPLEMENT.

ANACARDIACEÆ.

Rhus *terebinthifolia*, Schlecht., Linn. vol. v. p. 600. Tepic (Lay!); San Blas (Sinclair!).

Rhus *macrophylla*, Hook. et Arn. Bot. Beech. p. 413. Acapulco (Lay and Collie!).

Rhus *aromatica*, Ait., var. foliis subtus dense fulvo-tomentosis.—Hook. et Arn. Bot. Beech. p. 248. Tepic (Lay!).

Elaphrium *Jacquinianum*, H.B.K., Nov. Gen. vol. vii. p. 23. t. 613. Tepic (Lay!).

LEGUMINOSÆ.

Eriosema *grandiflora*, Seem.—*Rhynchosia grandiflora*, Schlecht., Hook. et Arn. Bot. Beech. p. 287. t. 59, et p. 418! Cerro de Pinal; San Blas to Tepic (Lay and Collie! Sinclair!).

OLACINEÆ.

Ximenia *parviflora*, Benth. Pl. Hartweg. p. 28. Sierra Madre.

PASSIFLORACEÆ.

219. Passiflora (§ Cieca) *Mexicana*, Juss., De Cand. Prodr. vol. iii. p. 324. Islands in the harbour of Mazatlan; it was found previously at Acapulco, according to De Cand.

CACTEÆ.

232. Mamillariæ inter se affines tres emortuæ. In the descriptions of these species *read* *α for* 34, *β for* 11, and *γ for* 12.

corrected page.

240. Mamillaria, sp. *For* 19 *read* 239.

259. Echinocactus *Wislizenii*, Engelm., supra, p. 290.

"It has been mentioned as something remarkable that one of M. Ehrenberg's *Echinocacti* had upwards of 2000 spines. By counting first the number of spines, then that of the bundles of each rib, and ultimately that of the ribs of every individual, I arrived at the following result:—An *Echinocactus Wislizenii*, Engelm., in the possession of Frederic Scheer, Esq., was found to have 8360 spines, and the *E. Visnaga*, Hook. (*E. platyceras*, Lem.), in the Royal Gardens, 17,600. There was formerly at Kew a specimen of the latter, which was at least three times larger than the present, and which cannot have had less than 51,000. Those *Cacti*, whose bundles consist of a greater number of spines, present results still more surprising. The tallest (*Pilocereus senilis*, Lem.), at Kew, having thirty in each bundle, has a total number of 72,000; yet these plants, giants as they appear in European conservatories, are but pigmies amongst their kindred at home. And if these small specimens have such a number, how many may a full-grown plant possess! and how great may be the number of spines produced in Mexico, a country where a man may travel for days without seeing any other vegetation save vast groves of Cactuses!"—Seem. in Hook. Journ. and Kew Misc. vol. iv. p. 123.

287. Cereus? vel Echinocactus? *For* (21) *read* (286).

CORNEÆ.

Cornus *grandis*, Schlecht. et Cham., Linnæa, vol. v. p. 171. Sierra Madre, on the road from Durango to Tepic.

HAMAMELIDEÆ.

Liquidambar *styraciflua*, Linn. Acapulco (Lay and Collie!).

The Hookerian Herbarium contains specimens from Jalapa (Linden, n. 1036! Galeotti!), Lexington, Kentucky (Short!), New York (Torrey!), New Orleans (Drummond, n. 321!), Louisiana (Tanitunier!), and Marañon (Warszewicz!).

COMPOSITÆ.

404. Trixis *obvallata*, Hook. et Arn. Cerro de Pinal (n. 1477).

OLEACEÆ.

Fraxinus *dipetala*, Hook. et Arn.—De Cand. Prodr. vol. viii. p. 275. Chihuahua (Potts!, who sent seeds raised by Mr. Scheer in his garden at Northfleet, Kent).

PIPERACEÆ.

Enkea *decrescens*, Miquel, in Hook. Journ. Bot. vol. iv. p. 40. Hacienda de Naranjas, foot of the Cerro de Pinal; Central America (Barclay!).

FLORA

OF

THE ISLAND OF HONGKONG.

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HISTORICAL NOTICE.

Prior to the commencement of the seventeenth century, the voyages undertaken to Canton, in the interests of commerce, had contributed nothing to our knowledge of the Flora of the South of China. In 1636, however, Michael Boymius, who had resided in the Chinese empire as a Jesuit missionary, published at Vienna an account of some plants of that country, accompanied by ill-executed coloured woodcuts, amongst which we find the first notice of the Lai-chi. Jacobus Bontius, who visited the East in the capacity of surgeon of a trading-vessel, described and figured various productions of these regions (including the Tea-plant) in Piso and Marcgraav's 'Natural History of India,' which appeared at Amsterdam in 1658. The port of Amoy and islands of Chusan, at both of which places the East India Company then had factories, were visited in 1698 and 1700 by James Cunningham, who had received the appointment of surgeon at those stations. He transmitted a great number of the vegetable productions of Chusan (amongst others hitherto unknown was the Tallow-tree, *Stillingia sebifera*) to Plukenet and Petiver, by whom they were published. Half a century later, Peter Osbeck, chaplain on board a Swedish vessel, published an entertaining work, entitled 'A Voyage to China and the East Indies,' which has been translated into English and other European languages, in which he paid much attention to Natural History, and gives plates of several new plants from the neighbourhood of Canton. Specimens of all he collected were furnished by him to Linnæus, by whom they were described. The next in order is João de Loureiro, a Portuguese priest, who resided more than thirty years as a missionary in Cochin-China, where, as in China, the Jesuits had acquired great reputation and influence by their skill in pure and applied mathematics and by their general knowledge, and where he had received the appointment of President of the Mathematical

and Physical Board at the Court. On his return to Lisbon (having by the way remained about three years at Canton) he published in 1790 his 'Flora Cochinchinensis,' which also contains a great number of plants collected by him in Southern China. This work was reprinted three years after at Berlin, by Willdenow, with notes and observations of his own; and, although the determinations are often inaccurate, and the diagnoses insufficient, it is still considered valuable. At the same period Lord Macartney's Embassy sailed for China, accompanied by two collectors, the fruits of whose labours are still preserved in the Banksian Herbarium at the British Museum. We may notice, by the way, the Russian voyage of circumnavigation, under the command of Captain Krusenstern (1803–6), who was accompanied by the botanists Langsdorff and Tilesius: the latter author has done much towards advancing our knowledge of the *Algæ* of the Chinese Seas. The expedition remained some months at Macao. Langsdorff, in conjunction with Professor Fischer, commenced publishing, in 1810, at Tübingen, the Botany of the voyage, but we believe one fasciculus containing Ferns is all that ever appeared. Dr. Clarke Abel accompanied as naturalist Lord Amherst's unfortunate Embassy to the Court of Peking, in 1816, and made extensive and valuable collections; but, with the exception of a few specimens sent home by another ship, the whole perished at the wreck of the 'Alceste,' in the Straits of Gaspar. A few years later (1820–23), the Horticultural Society of London sent out successively Messrs. Potts and Parkes to Canton as collectors, through whose exertions both the gardens and herbaria of Europe have been greatly enriched. Extensive materials were furnished by the researches of Mr. G. T. Lay, naturalist of H.M.S. Blossom, commanded by Captain F. W. Beechey, and which, in the course of a voyage (1825–28) to the Pacific and Behring's Straits, made some stay at Macao. The Botany of this voyage, elaborated by Sir W. J. Hooker and Dr. Walker Arnott, and produced in a similar form to the present volume, appeared in 1841. Professor F. J. F. Meyen, of Berlin, in the course of a voyage of circumnavigation undertaken by him from 1830 to 1832, a relation of which he afterwards published under the title 'Reise um die Erde,' twice visited Macao and Canton; he inserted some remarks on the climate and vegetation of the South of China, in the seventeenth volume of the 'Transactions of the Imperial Leopoldino-Caroline Academy of Naturalists,' and new plants collected by him were described by Schauer and Walpers, in a Supplement to the nineteenth volume of the same 'Transactions.' The various herbaria of Europe have also largely profited by the labours of M. Gaudichaud, who, as naturalist to the expedition of the 'Bonite,' which visited Canton and Macao in 1836–7, amassed considerable materials, as well by his own researches as by the care of the French Fathers of the foreign missions resident at the latter port. In 1841, Mr. R. B. Hinds, surgeon of H.M.S. Sulphur, which, on its return from a surveying voyage to the Pacific Ocean and the North-west coast of America, took a part in the operations during the Chinese war, collected an herbarium of about a hundred and thirty species at Hongkong, which were determined and described by Mr. Bentham in 'Hooker's Journal of Botany' for 1842, and preceded by a notice on the physical aspect, climate, and vegetation of the island,

written by Mr. Hinds. At the same period, Dr. Theodore Cantor published some useful remarks on the Island of Chusan, where he collected about a hundred and fifty species, the generic names of which were revised by the late Mr. Griffith (Ann. Nat. Hist. ix. 265). Subsequently, Mr. Robert Fortune arrived in China in the commencement of 1843, as collector for the Horticultural Society of London, and made various excursions in Hongkong and its neighbourhood. Many new plants discovered by him in these districts, and in his travels in the Northern Provinces of China, have been described by Professor Lindley in the 'Journal of the Horticultural Society.' Finally, Major Champion, of H.M. 59th Regiment, having removed in 1847 to Hongkong, commenced an indefatigable study of the Flora of the Island; the late Dr. Gardner described several new and interesting species transmitted by him in 'Hooker's Journal of Botany and Kew Garden Miscellany' for 1849, and a full and critical review of his herbarium, by Mr. Bentham, appeared in the same periodical. To these must be added Lieutenant-Colonel J. Eyre, R.A., Dr. W. A. Harland, and J. C. Bowring, Esq., lately or at present residing in the island, to whom we are indebted for many valuable contributions.

The above is, it is believed, a nearly complete list of the furtherers of our knowledge of the Flora of these regions; others have been purposely omitted, either because their researches were confined to more northern districts of the same empire, such as D'Incarville, Bunge, etc., or because, as in the cases of Cleyer, Sonnerat, Menzies, Sparmann, etc., they did not seem of sufficient importance to deserve particular specification. In conclusion, we may observe that various European gardens and herbaria have been enriched by the contributions of Vachell, Reeves, Philippi, Calléry, Braine, and others.

The collections which form the chief basis of the following enumeration were made by Dr. H. F. Hance, who arrived in Hongkong towards the end of 1844, and remained there until April, 1851, when he came back to Europe with his collections, and deposited them with the Author. Dr. Hance himself published a considerable number of new plants discovered by him in the second volume of Walpers' 'Annales,' and in 'Hooker's Journal of Botany and Kew Miscellany;' and he has besides supplied the chief parts of the notes for the Historical Notice and the Introduction of this Flora. The Author's own stay at Hongkong and the neighbourhood was limited, from the 1st to the 22nd of December, 1850, an account of which will be found at p. 225 of the second volume of the 'Narrative of the Voyage of H.M.S. Herald,' and in 'Hooker's Journal of Botany.'

All allusions to the progress which the Chinese themselves have made in Botany have here been purposely omitted, not indeed because it would have appeared pedantic to do so, but because any observation which might have been offered must necessarily had been derived from second hand, and at the same time unscientific sources; but it is to be hoped that some scientific man, conversant with the Chinese language, will investigate this subject as it deserves. Prior to the Tartar conquest of the Celestial Empire, the natives seem to have made considerable advance in the study of their Flora; indeed, if we take the 'Pun-tsan-

kang-muh' (Materia Medica) of Li-shi-chin as the standard to judge of their knowledge, we must own that they were, at the time that great work was written, as nearly as possible on a level with their contemporaries in Western Europe. The 'Pung-tsan-kang-muh,' to which allusion has been made, is a valuable compilation, and was first published about three hundred years ago; it consists of no less than forty closely-printed octavo volumes,* containing several hundred figures and several thousand descriptions of minerals, plants, and animals used in medicine. True, both these representations and descriptions are imperfect, but they are by no means inferior to those found in the 'Kräuterbücher' and Herbals published in Europe before the time of Linnæus. To identify the names and figures given by Li-shi-chin with scientific appellations, will be an interesting study to those who occupy themselves with Chinese Natural History, and, judging from the few extracts which have from time to time been published, the labour of translating the whole into some European language would be amply repaid by a vast amount of curious and useful information, and has indeed become one of the desiderata of our time.

* That is the number of the volumes in my possession; Daniel Hanbury, Esq., has however ten more. Whether my edition is a different one from his, or whether my copy is imperfect, I have at present no means of deciding.

INTRODUCTION.

HONGKONG, a corruption of Hiangkiang, "the fragrant streams," is the name of one of a number of islands in the China Sea, at a short distance from the mouth of the "River of Pearls," on the left bank of which stands the city of Canton, and from which it is divided by a narrow strait, called Kap-shui-mún (*vulgò*, Cap-sing-moon*), or "Swift-water Passage," running between the mainland and a continuous chain of small islands, of similar character and aspect to itself. It is situated between lat. 22° 9′ and 22° 21′ north, and long. 114° 6′ and 114° 18′, and is distant from Canton about eighty-five miles, and forty from the Portuguese settlement of Macao, on the peninsula of Kiangshan. At the narrowest part of the Lai-i-mún passage to the eastward, it is only about half a native mile from the mainland. It resembles, in general form, a scalene triangle, of which the apex is towards the west, but is of very irregular and sinuous outline, especially on the southern coast, which forms the longest side of the triangle, having an area of 29·14 square miles; while it is not quite twenty-seven miles in circumference. It consists of a long and precipitous mountain-ridge, running east and west, in some places gradually sloping down towards the sea, where it is met by extensive level beaches of fine, clear, white quartz-sand; in others terminating abruptly in frowning, perpendicular cliffs, more than a hundred feet in height, perforated at their base by caverns, into which the waves dash with a hollow sound, throwing up clouds of spray. From this ridge spurs diverge at different angles. The peaks vary in altitude, the loftiest being about 1860 feet above the sea-level. The prevailing rock is syenite (extensively quarried, and used for edifices), which is found in immense blocks, imbedded in a soil composed of the same rock, in various stages of disintegration and decomposition (laterite), or piled up in fantastic shapes on the hill summits. The constituents of this rock also occur more or less separate; felspar in its normal condition, or changed into a pure white or pinkish clay; hornblende cropping out on the surface, in deep black, lustrous

* By a very natural error, plants gathered about this locality are noticed thus in nearly all systematic works: "Hab. in Cap. Syng-moon," or "Crescit ad Prom. Sing-moon," the first word being understood as an abbreviation of *Caput*.

crystals; and quartz traversing the laterite in dykes of variable thickness. Masses of trap are also met with, translucent crystals of carbonate of lime not unfrequently found in the centre of the blocks of syenite, and the beds of ravines afford fragments of laminated mica. No signs of stratification or of volcanic action are discoverable. At the base of the primary ridge, in those places where it terminates at some distance from water-mark, and between the various spurs, patches of alluvial soil are found, consisting exclusively of decomposed vegetable matter washed down by the rains, and mingled with the laterite. These are sedulously turned to account by the natives for agricultural purposes, and, owing to care in manuring and irrigation, are sufficiently productive. The numerous ravines by which the flanks of the hills are cleft, furnish a never-failing supply of water, remarkable for its extreme purity; and a little below one of the loftiest peaks a considerable spring arises, the singular position of which leads to the belief that it may have a submarine communication with the mainland. During the summer season these streams become greatly swollen; and the spectator sees the angles of junction of the spurs and main range distinctly traced out, by lines of foam indicating the course of these turbulent cascades.

The climate is subject to a variation of temperature, from 47° to 93° Fahr. The daily range rarely exceeds 15°. Once only, during the years 1844–1851, did the thermometer sink as low as freezing-point.* Towards the end of October or the commencement of November the north-east monsoon sets in. The atmosphere is now wonderfully serene; the air cold, bracing, and dry; and the transition from an atmosphere saturated with moisture is marked by the warping and splitting of tables and other wooden articles of furniture, accompanied by considerable noise, and the curling up of papers, as occurs in this climate when they are placed in a heated room. This is the winter, which endures until about the middle of February, during which scarcely any rain falls, and vegetation is dried up and scanty, a few *Compositæ* being nearly all that can be found flowering. Gradually the temperature becomes higher, the atmospheric deposits greater, the dry, discoloured leaves of the Myrtle, *Melastoma*, and *Emblica* fall, their branches kindle with a tender vernal green, and innumerable flowers spring up from the turf, until about May summer is heralded by the advent of the south-west monsoon. This season is characterized by a most intense and oppressive heat, which causes the greatest languor to European residents; rain falls for a

* The following table is based on observations made during six consecutive years, and is extracted from an Almanack published in the Colony of Hongkong:—

	Max.	Min.	Mean.		Max.	Min.	Mean.
January . .	73° F.	49° F.	61·65° F.	July	92° F.	80° F.	85° F.
February .	78	50	63·5	August . . .	92	78	83·5
March . .	80	49	65·7	September . .	93	78	82·9
April . . .	87	49	72·7	October . . .	90	67	80·3
May . . .	88	68	78·3	November . .	85	57½	72
June . . .	92·5	75	83	December . .	77	47	63·6

week or ten days together, rather in sheets than drops; the swollen torrents rush roaring down into the sea, which they often discolour for a quarter of a mile from the shore; terrific thunderstorms reverberate amongst the hills, which are hidden in a dense veil of cloud and mist; and such is the excessive humidity of the atmosphere, that articles of wood or Russia leather, or the covers of books, even if washed over with alcohol or a solution of some essential oil, become, in the course of a night, covered with a thick blue mould. The rain will then cease for a few days; the heavens remain unclouded, though always more or less hazy, and lit up in the evenings by almost unintermitting flashes of sheet lightning; not a breath will agitate the air, tremulous with the heat radiated from the ground; and the silence is alone broken by the unceasing, loud, and monotonous chirping of the *Cicadeæ* hidden in the grass. At this period vegetation is at its height, and is developed with wonderful rapidity: a few days suffice to perfect the blossoming of the richest flowers, which again fade as quickly; so that to an occasional explorer the face of Nature is singularly protean, and impresses him with a high idea of its luxuriance. About the beginning of September the rain becomes much less frequent, though the heat is still excessive, and, as a natural consequence, the Flora assumes a more sober and less attractive habit. This period may be considered equivalent to a European autumn. It is now that the island is occasionally visited by typhoons, those terrible circular storms which traverse the Indian Ocean and China Sea, and, when they meet with the land in their course, unroof houses, tear off and carry away doors and venetians, drive vessels from their anchorages, prostrate trees, blight and destroy nearly all vegetation, and cause wreck and devastation wherever they pass. Finally, the temperature decreases, the rains cease, and the vegetable world remains dormant, seeking repose after its late activity, and recruiting strength for that of the succeeding year: winter has again returned, and the cycle of the seasons is completed.

To a stranger landing, or regarding the island from the sea, the aspect of Hongkong is very unpromising, conveying the idea of almost absolute sterility. The hills are covered by a mantle of coarse grass, amidst which rise masses of bare, blackened rocks; while the monotonous scene seems only varied by a few bushes, or a solitary tree, studded here and there, and by scattered groves of the *Pinus Sinensis* clothing some of the declivities. As remarked by Meyen, there is no doubt that this tree was at one time far more common, and originally formed dense woods on the flanks of the hills of all the islands hereabouts; but it is used very extensively by the Chinese for burning, and, plantations being seldom or never formed, it thus decreases rapidly. On a closer inspection, however, the botanist is gratified by finding that the first impression is very deceptive; and indeed it is probable that, whether as regards the number of species, or the variety of new and interesting forms comprised in its Flora, the island is, from its size and geographical position, entitled to a very high rank.

The *littoral* Flora consists of *Vitex trifolia*, the fruit of which resembles Allspice in taste, *Clerodendron inerme*, *Scævola Taccada*, *Ipomœa Pes-capræ*, trailing to an immense distance along the sands, and rooting at intervals, *Dilivaria ilicifolia*, two or three species of

Euphorbia, *Guilandina Bonduccella*, forming in some places impenetrable thickets, *Wollastonia scabriuscula*, *Platycodon grandiflorum*, always amongst rocks close by the sea, *Crotalaria calycina* and *C. albida*, *Ægiceras majus*, *Ardisia crispa*, *Paritium tiliaceum*, which affords a magnificent spectacle when covered with its fine sulphur-coloured flowers, which are much infested by a large black ant, *Abrus precatorius*, *Cassia pumila*, *Glossogyne pinnatifida*, *Pandanus fœtidus* (much used as a hedge by the natives, who also eat the tender shoots, by which means, and by constant clipping, it remains stemless, though, when left to itself, it assumes an arborescent form), the lovely and fragrant *Crinum Asiaticum*, *Tetranthera Roxburghii*, a fine tall tree, *Spinifex squarrosus*, a *Rottbœllia*, and *Heteropogon contortus*.

Amongst those plants which occupy a subordinate position in the Flora, but are still more or less common or characteristic, must be enumerated a pretty little *Curculigo*, with leaves like a *Luzula*, which expands its star-like, golden-coloured blossoms close to the earth, on the advent of spring, *Rourea microphylla*, *Ternstræmia Japonica*, *Ficus pyriformis*, *F. stipulata*, and *F. hirta*, *Crotalaria elliptica*, with its hispid, orbicular legumes, the fine crimson-flowered *Ixora blanda*, *Begonia Bowringiana*, *Raphiolepis rubra*, which replaces our Hawthorn, *Æginetia Indica*, *Bambusæ*, the elegant *Blackwellia Loureirii*, *Massænda pubescens*, conspicuous for its large, irregular, snow-white calyx-segment, *Paliurus Aubletii*, *Berchemia lineata*, a *Strychnos*, the seeds of which are employed by the Chinese, under the name of *Má táu*, or Horse-beans, for the destruction of rats, etc., *Choripetalum obovatum*, *Striga hirsuta*, the Tallow-tree (*Stillingia sebifera*), *Jasminum paniculatum*, fragrant and free-flowering, the purple-bloomed *Pterostigma grandiflorum*, a scandent *Pothos*, *Paratropia Cantoniensis*, a handsome shady tree, *Syllisium buxifolium*, a very neat shrub, *Embelia Ribes*, *Osbeckia Chinensis*, *Ardisia primulifolia*, adorned with glossy, crimson, holly-like berries, *Rostellularia procumbens*, etc. *Cardiospermum Halicacabum*, with its bladdery fruit, scrambles amongst the herbage, amidst which rise the pretty lilac spikes of *Ophiopogon spicatus*. Several *Gardenias*, *Ilices*, *Pittosporum glabratum*, and *Eyrea vernalis*, please the eye by the neatness of their foliage, round which *Cuscuta monogyna*, *Toxocarpus Wightianus*, and several *Bauhinias* twine their slender stems. To these must be added a velvet-leaved arborescent *Sponia*, the delicate *Salomonia Cantoniensis*, *Oxalis corniculata*, *Rubus parvifolius*, *R. leucanthus*, and *R. reflexus*, the latter remarkable for the extreme beauty of its foliage, two handsome *Cæsalpiniæ*, *Zornia diphylla*, which enamels the turf with its minute yellow blooms, resembling those of our *Lathyrus pratensis*, *Asparagus falcatus* (to which must be referred, as a synonym, the *Melanthium Cochinchinense* of Loureiro, placed by Kunth among altogether doubtful plants), several species of *Hedera* and *Cissus*, and, amongst Ferns, *Osmunda Vachellii* and *Blechnum orientale*.

Streamlets and their banks, moist rocks and inundated localities are rendered gay by the delicate *Drosera Loureirii*, *Xyris Indica*, an elegant Primulaceous plant, white, yellow, and blue-flowered *Utriculariæ*, the tall *Philydrum lanuginosum*, *Ludwigia*, *Jussiæa* with their white or yellow blossoms, *Hypericum monogynum*, *Eriocaulon Cantoniense*, and another very

minute species, raising their clustered, white, globular heads above the clear water, amidst the lively green fronds of *Ceratopteris thalictroides;* whilst waysides and arid places furnish the ephemeral *Cyanotis axillaris*, and several *Commelynæ*, *Polygona*, *Alternanthera axillaris*, thorny *Sclerostyles*, *Achyranthes aspera*, *Emilia sonchifolia*, two or three *Sidæ*, our garden *Chrysanthemum* (*Pyrethrum Indicum*, DC.), with single yellow flowers, *Corchorus acutangulus*, bearing a fruit with divergent horns, *Triumfetta angulata* and *C. cana*, and *Urena sinuata*, all three employed, by the Chinese, as demulcents and emollients in blennorrhœa and other diseases, on account of the great quantity of mucilage they afford. *Erianthus Japonicus*, growing in thick tufts, attains a height of six or eight feet, and elevates its beautiful, light, feathery panicles amongst the rocks. The dark-blue berries of *Dianella ensifolia* hang pendulous above its sword-like leaves, along with the cedar-scented *Caropteris mastachanthus*, and the graceful lilac bells of *Gutzlaffia aprica*.

Amongst *ruderal* plants (by which are understood all those that, though not cultivated, are yet only found in the immediate vicinity of dwellings, or in places formerly occupied by them, and which appear, in many instances, to follow the footsteps of man spontaneously) are the following:—*Solanum nigrum*, and another thorny species of *Solanum*, with purple flowers and yellow fruit, the size of that of the potato, *Amaranthus spinosus*, *Xanthium discolor*, *Asclepias curassavica*, *Plantago major*, *Psidium*, *Stellaria media* and *S. uliginosa*, *Ranunculus sceleratus*, *Datura alba* (the seeds of which are burnt by burglars when attempting to enter a dwelling, in order, by their fumes, to stupefy the inmates, a device which is, unfortunately, often crowned with success), *Polanisia icosandra*, *Cardamine hirsuta*, *Nicotiana Tabacum*, *Bidens Chinensis*, *Corchorus capsularis*, *Bryophyllum calycinum*, the singular *Euphorbia Tirucalli*, with its leafless, green, quill-like branches, abounding in a violently-acrid milky juice, said to be employed, by the Chinese, for blinding those children whom they wish to bring up as mendicants, in order thereby to excite compassion, *Siegesbeckia orientalis*, *Cassia occidentalis*, *Sonchus oleraceus*, *Ricinus communis*, of which the two varieties, one with red and the other with pale veins to the leaves, appear never to be found intermixed, *Verbena officinalis*, *Capsella Bursa-pastoris*, a *Galium* closely allied to *G. Aparine*, *Rumicis* sp., *Plumbago Zeylanica*, *Lochnera vincoides*, *Physalis pubescens*, *Bothriospermum tenellum*, *Pedalium murex*, *Dysosmia fœtida*, *Mucuna macrobotrys*, and *Cerbera Odallam*.

The *sylvan* Flora consists of six species of Oak, amongst which is *Quercus cornea*, Lour., the fruit of which, resembling the chestnut in taste, is sold in markets, *Liquidambar*, an elegant *Styrax*, *Acer*, *Camellia Japonica* and others, *Vaccinium*, *Cyminosma resinosa*, several species of *Evonymus*, *Aquilaria Chinensis*, *Memecylon*, an extremely handsome *Castanea*, *Rhodoleia formosa*, *Calauma pumila*, *Artabotrys*, the graceful *Melaleuca*-like *Phoberos sævus* and *P. Chinensis*, *Piper arcuatum*, two species of *Elæocarpus*, *Rhapis Kwanwortsik*, *Hiptage Madablota*, the sweet-scented *Schæpfia Sinensis*, etc. At the foot of the hills, on the slopes of which these woods occur, are ravines, whereof the sides are in some places formed by steep rocks, the humid, shady ledges of which are clothed by the lovely *Chirita Sinensis*, the ex-

quisite *Cypripedium purpuratum*, *Renanthera coccinea*, *Pholidota imbricata*, and a few others. Higher up, and in sheltered localities, these woods become in some parts much denser, and assume a far more tropical aspect, as is indicated by the great abundance of *Lycopodia*, and the appearance of *Cibotium glaucum*, *Neottopteris nidus*, and *Psilotum triquetrum;* whilst the trunks of the trees are clothed by a climbing, large, glossy-headed *Anthurium*, and the epiphytal *Niphobolus pertusus*.

At or near the summits of the different peaks, where, from altitude and the free exposure to both monsoons, the temperature is much lower than on the flanks of the hills, a difference of as much as 10° existing in the summer season, the Flora has a more European character. It comprises the pretty, but scentless, *Viola tenuis*, *Lonicera*, *Clematis*, *Polygala Loureirii*, *Polyspora axillaris*, the lovely *Enkyanthus reticulatus*, the "new-year flower" of the Chinese (*Phajus grandifolius*), *Rhododendron squamatum* and *R. Indicum* (the latter so profuse a flowerer that it looks, at a distance, when brought into relief by the dusky sides of the rocks, or the dry grass, like a bush of fire), the azure *Exacum bellum*, replacing our Gentians, *Torenia Asiatica*, *Chloranthus inconspicuus*, *Cirsium Chinense*, *Lilium longiflorum* (affording a magnificent spectacle, with its large, cernuous, white flowers, and the bulbs of which, when stewed, are much esteemed by the natives), a particularly elegant little *Composita* (*Gerbera amabilis*, Hance), and *Ligularia Kämpferi*, confined to the damp ledges of rocks; whilst the deep green, luxuriant carpet of verdure is enamelled by the most beautiful *Orchids*, such as the golden *Spathoglottis Fortuni*, *Arundina Philippi*, the modest *Spiranthes australis*, β. *pudica*, *Platanthera Susannæ*, with its laciniated, snowy perianth, *Glossaspis antenifera*, etc., and the Heath-like *Bæckia frutescens*, which, when rubbed between the hands, exhales a most pleasant aromatic odour, springs up in moist places, with a glaucous *Carex*, *Scleria*, and *Lepidosperma*.

The *normal*, or characteristic species, those which are most widely distributed, most numerous, and which most clearly strike the observer, as constituting the peculiar and distinguishing character of the Flora, are, amidst a thick but rather coarse turf, consisting of species of *Cyperus*, especially in damp localities, *Paspalus*, *Chrysopogon*, *Andropogon*, *Anotherum*, *Digitaria*, *Lycopodium cernuum*, etc., *Myrtus tomentosa*, with its gay, rose-coloured flowers, and sober green leaves, clothed beneath with a close white down, which is met with everywhere, and may be considered the commonest plant in the island, and the fruit of which, when ripe, has a resinous, not unpleasant taste, somewhat resembling that of the Black Currant, and is eaten by the natives, *Melastoma calycina* and *M. macrocarpon*, covered with magnificent purplish-pink blossoms, *Ancistrolobus ligustrinus*, a pretty, compact shrub, with dark, blood-coloured flowers, something like our St. John's-wort, and *Callicarpa tomentosa*, and another with branches hidden in a velvety, fulvous down, lovely bright-green leaves, farinose beneath, and dense branches of small reddish-lilac flowers. An *Emblica*, very common on the low grounds, is among the first to put forth its delicate green leaves on the approach of spring, two *Clerodendra*, the neat, Myrtle-like *Rospidios vaccinioides*, *Stro-*

phanthos divergens, with its trailing branches, dark, glossy foliage, and curious, reddish-yellow, caudate corollas, two pretty *Uvariæ*, *Helicteres angustifolia*, *Desmodium triquetrum*, *Dicerma elegans* (to which may be referred, without doubt, the *Æschynomene heterophylla* of Loureiro, hitherto undetermined), and *Melanthesa Chinensis* are almost equally common. *Alpinia nutans* elevates its gorgeous racemes of flowers, of a light flesh-colour, streaked with the intensest gold and scarlet, by the watercourses; *Ameletia subspicata* in some parts clothes the flat, moist, meadow-like turf with so thick a verdure, that, when in blossom, it looks, at a distance, like a field of thyme; the silvery foliage of the graceful *Rhus succedaneum* flutters in the breeze, *Smilax glabra* straggles over the rocks, *Lygodium Japonicum*, and the leafless, parasitical, intertangled *Cassyta filiformis* climb over all shrubs indiscriminately, the latter perfidiously abstracting the sap, with its cup-like suckers, from those plants from which it claims support; and the abundant, pectinated *Gleichenia dichotoma*, with *Pteris memoralis*, *Adiantum amœnum*, *Nephrolepis tuberosa*, and other Ferns, spring up among the herbage.

The most noticeable feature in the Flora of this Island is the mixture of Asiatic and European forms, especially conspicuous in the vernal vegetation of the hill summits; in this respect it appears to approach closely to that of Cashmere. Its most obvious relationship is with Japan. Its connection with that of Australia is very slight, being merely indicated by such genera as *Stylidium* and *Philydrum*, the last of which is exclusively confined to Cochin China, the south of China, and parts of New Holland. Tropical plants, identical with, or intimately allied to, those of the Indian peninsula and the Malayan Archipelago, are not unfrequent. *Anthurium*, *Chirita*, *Æschynanthus*, *Sponia*, *Piper arcuatum*, etc. etc., may serve as examples, but they by no means represent the normal character of the Flora, which is perfectly *sui generis*. The only three indigenous Palms are a dwarf, stemless *Phœnix*, a *Zalacca*, and a *Rhapis*. *Cocos nucifera* is occasionally planted, but does not thrive, the island of Hainan being its most easterly station in these seas, and even there it is said to perfect fruit sparingly.

Amongst cultivated plants the Sweet Potato (*Batatas edulis*) holds the first rank; it is very largely consumed by the Chinese, even its boiled leaves being used as greens: beside this we must notice as edible vegetables, Yams (*Dioscorea*, sp.) and *Colocasia*, several species of *Sinapis* and *Brassica*, *Basella rubra* (employed as a substitute for Spinach), various species of *Dolichos Soja* and *Phaseolus*, Egg-apples (*Solanum Melongena*), our common Potato and Pea, Water-melons and other *Cucurbitaceæ*, Ground-nuts (*Arachis hypogæa*), a little Barley, grown exclusively for pearling, Cassava (*Manihot utilissima*), *Allium fistulosum*, Rice, Millet, *Setaria*, Sugar-cane, Maize, *Abelmoschus longifolius*, the immature viscid capsules of which are brought to table; and, as fruit, Pomeloes (*Citrus Decumana*), Oranges, Loquats (*Eriobotrya Japonica*), Papaws (*Carica Papaya*), Wangpis (*Cookia punctata*), *Nephelium Litchi* and *N. Longna*, Mangoes, Bananas, Pine-apples, *Averrhoa Carambola*, Guavas, and *Jambosa Malaccensis*. The farinaceous fruits of *Trapa bicornis*, those of *Canarium album*, preserved with salt, and much resembling an olive in flavour, the crimson papillose

acid drupe of a species of *Elæagnus*, Pears, Plums, and Peaches of exceedingly bad quality, and the amygdaloid nuts and fleshy root of *Nelumbium speciosum*, are brought to market, and are all grown in its vicinity, though not in the island itself. *Gossypium herbaceum*, *Bœhmeria nivea*, *Piper Betle*, and a species of *Indigofera*, are cultivated for economic purposes other than esculent. *Ficus nitida*, the claims of which as a true native are considered doubtful, is planted around the villages; the fields and garden-patches are surrounded by hedges of *Pandanus fœtidus*, *Euphorbia nereifolia*, or *Curcas purgans*.

The Fauna of the island is not of great extent; it comprises a small species of Deer—very rare, if not extinct at present,—Foxes, a Manis, two Bats, Rats, and several other small *Muridæ;* a Vulture, Gulls, two or three species of King-fishers, Partridges, Jungle-fowl, Quails, Snipes, Sandpipers, Curlews, Cormorants, Minas, Shrikes, Java Sparrows, Magpies, House Sparrows, a Swallow, two Owls, etc.; six or seven species of Snakes, Lizards, including the common Gecko, and innumerable insects, amongst them a large black Ant, which constructs in the bushes paper-like nests made of leaves, and about the size of a child's head. The spring near the top of the hill above alluded to contains a small fish, said to constitute the type of a new genus, and others are met with in various fresh-water streams. Sponges and Zoophytes are found on its shores, and the adjacent waters swarm with an infinite variety of fish, and a Cephalopod, resembling our Cuttle-fish, which is eaten by the natives.

SYNOPSIS.

RANUNCULACEÆ.

1. Clematis *uncinata,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 255. In a ravine behind Mount Parker, near Saiwan (Champion !).

2. Clematis *parviloba,* Gardn. et Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 241.—Benth. ibid. vol. iii. p. 255. Happy Valley, near the waterfall, and towards West Point, under the Buddhist Cave (Champion !).

3. Clematis *Meyeniana,* Wlprs. Pl. Meyen. p. 277.—*C. oreophila,* Hance in Wlprs. Ann. vol. ii. p. 3 ! Common in almost every ravine in the Island (Champion ! Hance ! Seemann !).

4. Ranunculus *sceleratus,* Linn., De Cand. Prodr. vol. i. p. 34.—*Hecatonia palustris,* Lour., Hook. fil. et Thoms. Fl. Ind. vol. i. p. 35. In waste places near houses (Hance !).

DILLENIACEÆ.

5. Delima *sarmentosa,* Linn., De Cand. Prodr. vol. i. p. 69.—*Leontoglossum scabrum,* Hance in Wlprs. Ann. vol. ii. p. 18, vol. iii. p. 812 !—Hook. fil. et Thoms. Fl. Ind. vol. i. p. 61. Common in ravines all over the Island (Seemann ! Champion ! Hance !).

MAGNOLIACEÆ.

6. Talauma *pumila,* Bl.—*Magnolia pumila,* Andr., De Cand. Prodr. vol. i. p. 81. Shrubby and rather scarce on Victoria Peak ; subarboreous and more common in the woods of the Happy Valley (Champion ! Hance !) ; also cultivated in the gardens of Hongkong and Macao.

Several species of *Magnolia* are cultivated in the gardens.

ANONACEÆ.

7. Uvaria *microcarpa,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 256.—*U badiiflora,* Hance in Wlprs. Ann. vol. ii. p. 19 ! Very common throughout the Island (Hance ! Champion !).

8. Uvaria *platypetala*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 257.—*U. rhodantha*, Hance in Wlprs. Ann. vol. ii. p. 19! Jungle near the Buddhist Temple, East Point (Champion! Hance!).

9. Unona *discolor*, Vahl, var. *lævigata*, Hook. fil. et Thoms. Fl. Ind. vol. i. p. 133.—*U. Chinensis*, Auct. Very common in the lower ravines (Champion! Hance! Seemann!).

"The immature fruit supplies a fine purple dye."—*Bowring*.

10. Artabotrys *odoratissimus*, R. Br. in Bot. Reg. t. 423, non Blume.—Hook. fil. et Thoms. Fl. Ind. vol. i. p. 128.—*A. hamatus*, Blume. Near the Buddhist Temple, East Point, and woods of the Happy Valley (Champion! Hance!).

11. Artabotrys *Blumei*, Hook. fil. et Thoms. Fl. Ind. vol. i. p. 128 in adnot.—*A. hamatus*, Benth. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 257. Woods of the Happy Valley, and jungle near the Buddhist Temple, East Point (Champion!).

SCHIZANDREÆ.

12. Kadsura *Japonica*, Don.—Benth. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 258. Rare; in a ravine below Victoria Peak (Champion!).

LARDIZABALEÆ.

13. Stauntonia *Chinensis*, De Cand. Syst. Veg. vol. i. p. 514. Trailing on rocks in ravines (Champion!).

MENISPERMACEÆ.

14. Limacia *cuspidata*, Hook. fil. et Thoms. Fl. Ind. vol. i. p. 189.—*Hypserpe nitida*, Miers in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 258! In a ravine of Mount Victoria (Champion! Hance!).

15. Cocculus *ovalifolius*, De Cand. Prodr. vol. i. p. 99.—Hook. fil. et Thoms. Fl. Ind. vol. i. p. 190.—*Nephroia pubinervis*, Miers in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 258! Found with the preceding in a ravine of Mount Victoria (Champion!).

16. Cocculus *macrocarpus*, Wight et Arn.—Hook. fil. et Thoms. Fl. Ind. vol. i. p. 191. Happy Valley (Hance! Seemann!).

17. Cyclea *deltoidea*, Miers in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 258. Ravines of Mount Victoria (Champion! Hance! Seemann!).

SABIACEÆ.

18. Sabia *paniculata*, Edgew.—Hook. fil. et Thoms. Fl. Ind. vol. i. p. 211.—*Androglossum reticulatum*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 42! In woods (Champion!).

NELUMBIACEÆ.

19. Nelumbium *speciosum*, Willd.—Hook. fil. et Thoms. Fl. Ind. vol. i. p. 248. Abundant in muddy marshes, according to Colonel Eyre; cultivated in the vicinity of Hongkong, according to Dr. Hance.

PAPAVERACEÆ.

20. Argemone *Mexicana*, Linn., De Cand. Prodr. vol. i. p. 120.—Hook. fil. et Thoms. Fl. Ind. vol. i. p. 251. In waste places (Champion! Hance!).

CRUCIFERÆ.

21. Capsella *Bursa-pastoris*, Linn., De Cand. Prodr. vol. i. p. 177. In waste places and cultivated lands (Hance!).

Also collected by me in Awatsha Bay, Kamtchatka.

22. Rhaphanus *sativus*, Linn., De Cand. Prodr. vol. i. p. 228. Cultivated and also semi-spontaneous in various parts of the Island (Hance!).

Cardamine *hirsuta*, L., is naturalized as a garden weed (Champion!).

CAPPARIDEÆ.

23. Polanisia *viscosa*, De Cand. Prodr. vol. i. p. 242.—*P. icosandra*, Linn. In waste places (Hance! Seemann!). Also found by me at Cowlung, on the Chinese mainland.

24. Capparis *membranacea*, Gard. et Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 241, et vol. iii. p. 259. Victoria Peak and Happy Valley woods (Champion! Hance!).

25. Capparis *pumila*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 260. In a ravine in the Black Mountain (Champion!).

FLACOURTIACEÆ.

26. Phoberos *Chinensis*, Lour., Wight et Arn. Prodr. vol. i. p. 30.—*P. sævus*, Hance in Wlprs. Ann. vol. iii. p. 825! Common in the Happy Valley woods (Champion! Hance! Seemann!).

27. Heptaca? *latifolia*, Gardn. et Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 243. —*Oncoba* sp.? Common in the Island (Champion! Hance!).

Both Champion's and Hance's specimens have only male flowers; all the ovaries are abortive; so it cannot be determined whether the placentation is axile or parietal, the plant a *Flacourtiacea* or *Tiliacea*, but it looks more like a *Flacourtiacea*.

VIOLACEÆ.

28. Viola *Patrinii*, *β. Chinensis*, De Cand. Prodr. vol. i. p. 293. Mount Parker (Hance! Champion!).

29. Viola *tenuis*, Benth. in Hook. Lond. Journ. Bot. vol. i. p. 482. Common on the hills (Champion! Hance!).

30. Viola *confusa*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 260. Mount Parker (Champion!).

POLYGALACEÆ.

31. Salomonia *Cantoniensis*, Lour., De Cand. Prodr. vol. i. p. 334. In marshy fields, abounding near the Albany Barracks (Champion! Hance! Seemann!).

32. Polygala *arillata*, Hamilt., Wight et Arn. Prodr. vol. i. p. 39. Mounts Gough and Victoria, but extremely rare (Champion!).

33. Polygala *glomerata*, Lour., De Cand. Prodr. vol. i. p. 326.—*P. densiflora*, Blume.—*P. arvensis*, Willd., var.?—Benth. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 261. Mount Victoria (Champion!).

34. Polygala *Loureiri*, Gardn. et Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 242.—*P. coniicarpa*, Hance in Wlprs. Ann. vol. i. p. 80! Mount Victoria (Champion! Hance!).

DROSERACEÆ.

35. Drosera *Loureiri*, Hook. et Arn. Bot. Beech. p. 167. t. 31. Common in all the marshes of the Island (Champion! Hance!).

PITTOSPORACEÆ.

36. Pittosporum *glabratum*, Lindl. Journ. Hort. Soc. vol. i. p. 230. Ravines throughout the Island (Champion!).

CARYOPHYLLEÆ.

37. Stellaria *media*, Smith, De Cand. Prodr. vol. i. p. 396.—*S. fœcunda*, Hance in Wlprs. Ann. vol. ii. p. 95!—*Cerastium petiolare*, Hance in Hook. Journ. Bot. and Kew Misc. vol. i. p. 143! In waste places (Hance!).

38. Stellaria *uliginosa*, Murr., Koch Syn. Fl. Germ. (ed. prim.) p. 120.—*Labrea aquatica*, A. St. Hil. nec Seringe in DC. Prodr.—*Stellaria leptophylla*, Hance in Wlprs. Ann. vol. ii. p. 96! In swamps (Hance! Champion!).

Dianthus Morrisii, Hance in Hook. Journ. Bot. vol. vii. p. 472; *Tunica? Morrisii*, Hance in Wlprs. Ann. vol. ii. p. 101! from Lintin, is doubtless *D. Caryophyllus*, L. Specimens brought by T. Thomson from the valley of the Indus seem to belong to the same species; but, as the petals are wanting, this latter point cannot be satisfactorily established. *Dianthus Chinensis* is cultivated in the Hongkong gardens.

OXALIDEÆ.

39. Averrhoa *Carambola*, Linn., De Cand. Prodr. vol. i. p. 689. Common in the Island, both in a cultivated and wild state (Hance!).

40. Oxalis *corniculata*, Linn., De Cand. Prodr. vol. i. p. 692. On roadsides and waste places (Champion! Hance!).

Linum usitatissimum, L., is only cultivated, according to Hance, in some parts of the Island.

MALVACEÆ.

41. Urena *lobata*, Linn., De Cand. Prodr. vol. i. p. 441, supra, p. 81. Common in the Island (Champion! Hance! Seemann!).

42. Paritium *tiliaceum*, Adr. Juss., Wlprs. Rep. vol. i. p. 311; supra, p. 82! On the sea-beach, on banks and enclosures (Champion! Hance!).

43. Sida *rhombifolia*, Linn., De Cand. Prodr. vol. i. p. 462, supra, p. 82. Common in waste places, on roadsides, etc. (Champion! Hance!).

44. Sida *cordifolia*, Linn., De Cand. Prodr. vol. i. p. 464. On roadsides, etc. (Champion!).

45. Sida *humilis*, Willd., De Cand. Prodr. vol. i. p. 463. In waste places, etc. (Hance!; also collected by Hinds, according to Bentham).

46. Malvastrum *carpinifolium*, Asa Gray, Wlprs. Ann. vol. ii. p. 152.—*M. ruderale*, Hance in Wlprs. Ann. vol. iii. p. 830.—*Sida carpinifolia*, L. fil., De Cand. Prodr. vol. i. p. 461. In waste places (Hance!); also at Macao (Hance!).

47. Abutilon *graveolens*, Wight et Arn. Prodr. vol. i. p. 56.—*Sida graveolens*, Roxb., De Cand. Prodr. vol. i. p. 473.—*Abutilon cysticarpum*, Hance in Wlprs. Ann. vol. ii. p. 157! On roadsides (Hance!); also on the mainland opposite Hongkong (Hance!).

Several *Malvaceæ*, including *Hibiscus Rosa-Sinensis*, *H. mutabilis*, *H. Manihot*, *H. trionum*, etc., are cultivated in the gardens.

STERCULIACEÆ.

48. Helicteris *angustifolia*, Linn., De Cand. Prodr. vol. i. p. 476. Very common in the low grounds (Champion! Hance! Seemann!).

49. Reevesia *thyrsoidea*, Lindl. Bot. Reg. t. 1236. Common in the Happy Valley woods; rare on Mount Victoria (Champion!).

50. Firmiana *platanifolia*, R. Brown, Plant. Jav. Rar. p. 235. Naturalized about Victoria (Champion!).

51. Sterculia *lanceolata*, Cav., Lindl. Bot. Reg. t. 1256. Common in ravines and woods, especially about the Buddhist Temple at East Point (Champion! Hance!).

BUETTNERIACEÆ.

52. Buettneria *aspera*, Colebr. in Roxb. Fl. Ind. ed. Car. et Wall. vol. ii. p. 383. Creeping over rocks in ravines, rather local in Hongkong, but covering much ground in some parts of the Chinese coast (Champion! Hance!).

53. Waltheria *Americana*, Linn., De Cand. Prodr. vol. i. p. 492. Common in open grounds (Hance!; also collected by Hinds, according to Bentham).

54. Pterospermum *acerifolium,* Willd.—Wight et Arn. Prodr. vol. i. p. 69. Woods near the Buddhist Temple (Champion !).

TILIACEÆ.

55. Corchorus *acutangulus,* Lam., De Cand. Prodr. vol. i. p. 505. In rice-fields (Champion ! Hance !).

56. Corchorus *capsularis,* Linn., De Cand. Prodr. vol. i. p. 505. Cultivated in fields, and growing in waste places (Champion ! Hance !).

57. Triumfetta *angulata,* Lam., De Cand. Prodr. vol. i. p. 507. Roadsides near the town of Victoria (Champion ! Hance !).

There are several forms of this variable plant in Dr. Hance's collection.

58. Grewia *microcos,* Linn., De Cand. Prodr. vol. i. p. 510.—Hook. et Arn. Bot. Beech. p. 170. Rather scarce; on the hill upon which stands the Fever Hospital (Champion ! Hance ! Seemann !).

59. Elæocarpus *serratus,* Linn., Wight et Arn. Prodr. vol. i. p. 82. Woods in the Happy Valley (Champion !).

60. Friesia *Chinensis,* Gardn. et Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 243. Woods about the waterfall in the Happy Valley (Champion !).

TERNSTRŒMIACEÆ.

61. Eurya *Chinensis,* R. Brown in Abel's Voy. App. p. 379.—Champ. in Linn. Trans. vol. xxi. p. 113, et Hook. Journ. Bot. and Kew Misc. vol. iii. p. 307. Happy Valley and Victoria Peak (Champion ! Hance ! Seemann !).

62. Eurya *Macartneyi,* Champ. (Tab. LXXIV.); frutescens, glabra, foliis majusculis coriaceis subellipticis obtuse acuminatis margine revolutis serrulatis, floribus majusculis dioicis, staminibus marium 14–22, stylis fœm. 3–4 distinctis revolutis, fructu purpureo circa 14-spermo.—*E. Macartneyi,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 307, et Linn. Trans. vol. xxi. p. 113. In woods and on rocks (Champion !).

A shrub; leaves $3\frac{1}{2}$–4 inches long, about 1 inch broad.

Plate LXXIV. Fig. 1, male flower; 2, petal, with stamens attached; 3, receptacle and part of calyx of the male flower; 4, female flower; 5, pistil; 6, section of ovary :—*all magnified.*

63. Ternstrœmia *Japonica,* Thunb. Fl. Japon. p. 224.—*T. Lushia,* Hamilt. !—*Cleyera fragrans,* Champ., et *C. dubia,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. pp. 307, 308 !, et Linn. Trans. vol. xxi. p. 115 !—*C. gymnanthera,* Wight et Arn. Prodr. vol. i. p. 78 !—Wight, Icon. vol. i. t. 47. Very common (Champion ! Hance ! Seemann !).

A widely-diffused plant, found in the Nilghiris (J.D. Hooker and T. Thomson! Th. Lobb! Hohenacker!); Japan (Thunberg, Siebold); Ceylon (Thwaites! Gardner! Champion !). The petals in Wight's Icones are drawn too pointed, as is evident from an examination of Wight's authentic specimens.

64. Ixionanthus *Chinensis,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 308.—Linn. Trans. vol. xxi. p. 114. t. 13 ! Happy Valley (Champion !).

65. Polyspora *axillaris*, Sweet, Hort. Brit. p. 61.—*Gordonia anomala*, Champ. in Linn. Trans. vol. xxi. p. 114.—*Camellia axillaris*, Roxb. Bot. Reg. t. 349, et Bot. Mag. t. 2047.—De Cand. Prodr. vol. i. p. 529. Common all over the Island (Champion! Hance! Seemann!).

66. Schima *superba*, Gardn. et Champ. (Tab. LXXV.); ramis teretibus verrucosis glabris, ramulis pilosiusculis, foliis ovato-ellipticis acuminatis supra medium serrato-crenatis glabris, petiolis puberulis, pedunculis ad extremitatem ramulorum axillaribus solitariis unifloris petiolum subæquantibus, sepalis rotundatis glabris sericeo-ciliatis.—*S. superba*, Gardn. et Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 246. Wong-ny-chung Valley (Champion!).

A shrub; leaves 3–5 inches long, and 1½–2 inches broad; flowers large, white.

Plate LXXV. Fig. 1, a flower-bud; 2, a flower cut open; 3, a stamen; 4, pistil; 5, section of ovary; 6, immature fruit:—*all*, with the exception of fig. 6, *magnified*.

67. Pentaphylax *euryoides*, Gardn. et Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 309.—Linn. Trans. vol. xxi. p. 114. t. 12! Common in the woods (Champion! Hance! Seemann!).

68. Camellia *Japonica*, Linn., De Cand. Prodr. vol. i. p. 529. Happy Valley woods (Hance! Seemann! Eyre! Champion!).

69. Camellia *salicifolia*, Champ. (Tab. LXXVI.); arbuscula, ramis pubescentibus flexuosis, foliis subsessilibus elongato-ovatis acuminatis serratis pubescentibus, floribus parvulis (albis), sepalis acuminatis pubescentibus, capsulis glabris parvis rostratis 1–3-spermis.—*C. salicifolia*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 309.—Linn. Trans. vol. xxi. p. 112. Woods of the Happy Valley, in company with *C. Japonica* (Champion! Hance! Seemann!).

A small tree; leaves about 4 inches long, and 9 lines broad; flowers white.

Plate LXXVI. Fig. 1, calyx and pistil; 2, 3, 4, stamens; 5, pistil; 6, section of ovary; 7, capsule; 8, pollen-masses:—*all slightly magnified*.

70. Camellia *assimilis*, Champ. (Tab. LXXVII.); fruticosa, ramulis glabris, foliis subsessilibus lanceolatis acuminatis serratis glabris, floribus parvulis pendulis (albis), sepalis sericeis obtusis, capsulis glabris parvis rostratis.—*C. assimilis*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 309.—Linn. Trans. xxi. p. 112. Mounts Victoria and Gough (Champion!).

A shrub; leaves about 3 inches long, and 9 lines broad; flowers white.

Plate LXXVII. Fig. 1, stamens and portions of corolla and pistil; 2, a stamen; 3, pistil; 4, capsule:—*all*, with the exception of fig. 4, *magnified*.

71. Camellia *spectabilis*, Champ. (Tab. LXXVIII.); arborea, foliis lanceolatis acuminatis glabris crenatis subtus reticulatis, floribus solitariis magnis (albis) axillaribus et subterminalibus, sepalis coriaceis fructibusque pomi magnitudine sericeis.—*C. spectabilis*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 310.—Linn. Trans. vol. xxi. p. 111. Mount Victoria and Happy Valley woods (Champion! Hance!).

A tree; leaves 4–5 inches long, and 1½–2 inches broad; flowers white.

Plate LXXVIII. Fig. 1 and 2, stamens; 3, pistil; 4, ovary cut open:—*all magnified*.

Camellia Banksiana, Lindl., mentioned by Champion, is a nonentity, as neither Lindley nor any other author has ever published such a name.—*Thea Bohea* is often employed for borders of garden-beds, as we do the Box.

72. Saurauja *tristyla*, De Cand. Prodr. vol. i. p. 526.—*S. Roxburghi*, Wall.? In the woods (Hance!).

GUTTIFERÆ.

73. Garcinia *multiflora*, Champ. (Tab. LXXIX.); foliis ovatis obovatisve acuminatis, floribus (hermaphroditis) corymboso-paniculatis 4-sepalis 4-petalis, staminibus 4-adelphis.—*G. multiflora*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 310. Towards the Black Mountain (Champion!).

A shrub; leaves 3–3½ inches long, 1½–2 inches broad.

Plate LXXIX. Fig. 1, an entire hermaphrodite flower; 2, calyx; 3, one of the petals; 4, bundle of stamens; 5 and 6, anthers:—*all magnified.*

74. Garcinia *oblongifolia*, Champ. (Tab. XCIII.); foliis oblongis basi longe angustatis breviter petiolatis, floribus terminalibus, fœmineis solitariis sessilibus, masculis 3–7 pedicellatis 4-sepalis 4-petalis, staminibus fere ad apicem monadelphis.—*G. oblongifolia*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 311. Happy Valley woods (Champion!).

A tree; leaves 2½–3 inches long.

Plate XCIII. Fig. 1, a male flower; 2, a petal; 3, anthers; 4, section of an anther; 5, pollen-masses; 6, branch, with female flower; 7, female flower, with one of the petals removed; 8, petal, and 9, abortive stamen of the same; 10, ovary; 11, section of ovary:—*all*, with exception of 6, *magnified.*

75. Calophyllum *membranaceum*, Gardn. et Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 309. Mount Victoria and Happy Valley woods (Champion!).

HYPERICINEÆ.

76. Hypericum *Japonicum*, Thunb., De Cand. Prodr. vol. i. p. 548.—*H. nervatum*, Hance in Wlprs. Ann. vol. i. p. 188! In swamps and ricefields, common (Champion! Hance!).

H. monogynum, Linn., is cultivated in the gardens.

77. Ancistrolobus *ligustrinus*, Spach, Ann. Sc. Nat. ser. 2. vol. v. p. 352.—*Elodea Chinensis*, Hance in Hook. Journ. Bot. vol. vii. p. 472. Very abundant in low grounds (Champion! Hance! Seemann!).

MALPIGHIACEÆ.

78. Hiptage *Madablota*, Gærtn., Wlprs. Rep. vol. v. p. 294. In the Happy Valley woods, also on rocks of Mount Gough (Champion!); Dr. Hance's specimens are from Mr. Braine's garden.

ACERINEÆ.

79. Acer *reticulatum*, Champ. (Tab. LXXX.); glabrum, foliis integerrimis ovatis oblongisve breviter acuminatis coriaceis reticulato-venosis utrinque viridibus, corymbis compositis glabris, alis fructus divaricatis.—*A. reticulatum*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 312. Mount Gough and Happy Valley woods (Champion!).

Allied to *A. oblongum*, Wall. Leaves from 3½ to 4 inches long, and from 1½ to 2 inches broad; the flowers white.

PLATE LXXX. Fig. 1, a flowering branch; 2, a branch in fruit; 3, a male flower; 4, hermaphrodite flower; 5, section of ripe fruit:—*all*, with exception of 1 and 2, *magnified*.

SAPINDACEÆ.

80. CARDIOSPERMUM *Halicacabum*, Linn., De Cand. Prodr. vol. i. p. 601. Trailing over shrubs and scrambling among the herbage (Hance!); also at Dane's Island, Whampoa (Hance!), and at Macao (Lay and Collie!).

81. NEPHELIUM *Litchi*, Camb. Mem. Sapind. p. 30. Cultivated on account of its edible fruit (Hance! Champion! Seemann!).

AURANTIACEÆ.

82. MURRAYA *exotica*, Linn., De Cand. Prodr. vol. i. p. 537. Cultivated in the gardens (Hance!); naturalized (Champion!).

83. COOKIA *punctata*, Retz, De Cand. Prodr. vol. i. p. 537. "Wangpy" of the colonists. Cultivated on account of its edible fruit (Hance!); naturalized (Champion!).

84. GLYCOSMIS *citrifolia*, Lindl. Trans. Hort. Soc. vol. vi. p. 72.—*Limonia citrifolia*, Willd., De Cand. Prodr. vol. i. p. 536.—*L. parviflora*, Bot. Mag. t. 2416. Rather scarce (Champion! Hance!).

85. SCLEROSTYLIS *buxifolia*, Benth. (TAB. LXXXI.); glabra v. ramulis minute puberulis, foliis obovali-oblongis emarginatis crebre parallele venosis, floribus axillaribus sessilibus subfasciculatis pentameris, staminibus liberis, ovario biloculari, loculis uniovulatis.—*S. buxifolia*, Benth. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 326.—*Severinia buxifolia*, Tenore, Cat. Hort. Nap. p. 96.—*Atalantia monophylla*, Hook. et Arn. non De Cand.! Abundant on the sides of the hills near the racecourse (Champion! Hance!); Macao (Millett!).

A shrub or small tree; leaves 1–1½ inch long, 6–9 lines broad; berry nearly black.

PLATE LXXXI. Fig. 1, an entire flower; 2 and 3, stamens; 4, ovary; 5 and 6, vertical and horizontal sections of ovary; 7, a branch, with ripe fruit; 8, seed; 9, section of seed; 10, embryo; 11, ditto, with one cotyledon removed; 12, plumule and radicle:—*all*, with exception of 7, *magnified*.

86. SCLEROSTYLIS *venosa*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 327. Fever-Hospital Hill, and other localities (Champion!).

87. SCLEROSTYLIS *Hindsii*, Champ. (TAB. LXXXII.); glabra, foliis ovali-ellipticis oblongisve obtusis tenuiter venosis, floribus axillaribus subfasciculatis pedicellatis pentameris, staminibus subconnatis, ovario biloculari, loculis biovulatis, stylo stigmate breviore.—*C. Hindsii*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 328.—*Atalantia monophylla*, Benth. in Lond. Journ. Bot. vol. i. p. 483! Common on wooded hills (Champion! Hance! Seemann!).

A shrub or small tree; leaves 1½–3 inches long, and about 1 inch broad; fruit orange-coloured.

PLATE LXXXII. Fig. 1, an entire flower; 2, calyx and stamens; 3, stamens; 4, calyx and pistil; 5 and 6, sections of ovary:—*all magnified*.

Citrus Aurantium, Risso, *C. Decumana*, L., and various other species or varieties of *Citrus*, are cultivated in the Gardens of Hongkong and Whampoa.

OLACINEÆ.

88. Schœpfia *Chinensis*, Gardn. et Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 308. Happy Valley (Champion! Hance!).

89. Cansjera *lanceolata*, Benth. in Lond. Journ. Bot. vol. i. p. 491. East Point, Happy Valley, and Little Hongkong (Champion!).

AMPELIDEÆ.

90. Vitis *Cantoniensis*, Seem.—*Cissus? Cantoniensis*, Hook. et Arn. Bot. Beech. p. 175!—*Cissus diversifolia*, Wlprs. Plant. Meyen. (Nova Acta), p. 314!—*Hedera hypoglauca*, Hance in Wlprs. Ann. vol. ii. p. 724! Very frequent in ravines and on barren hills (Champion! Hance! Seemann!); also found at Macao (Vachell!); Canton (Lay and Collie!); on the Cap-Syng-Moon (Meyen); and in the Khasya (Griffith!).

91. Vitis *parvifolia*, Roxb. Fl. Ind. vol. i. p. 662.—*V. succisa*, Hance in Wlprs. Ann. vol. ii. p. 231!—*V. truncata*, Blume? Climbing over shrubs and trees (Champion! Hance!); also found at Macao (Millett!); and in Assam (Wallich!); Kumaon (Strachey and Winterbottom! Th. Thomson!); Himalaya (Thomson!); Khasia Mountains (Hook. fil. and Thoms.!); Java (Zollinger, n. 909!); eastern parts of Bengal (Roxburgh!).

RUTACEÆ.

92. Xanthoxylon *nitidum*, De Cand. Prodr. vol. i. p. 727. Rather abundant in the ravines (Champion!).

93. Xanthoxylon *cuspidatum*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 329. Less common than *X. nitidum*, and rather local (Champion! Hance!).

94. Xanthoxylon *Avicenniæ*, De Cand. Prodr. vol. i. p. 726.—*X. lentiscifolium*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 329. Common on Mount Gough and other localities (Champion!).

95. Xanthoxylon *pteleæfolium*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 330. On Mount Gough (Champion); also collected in the Philippines (Cuming, n. 1819!).

96. Boymia *glabrifolia*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 330.—*Megabotrya meliæfolia*, Hance in Wlprs. Ann. vol. ii. p. 259! Scarce in Hongkong (Champion! Hance!), but abundant on the Chinese coast (Millett! Parkes).

97. Toddallia *floribunda*, Wall. Plant. Asiat. Rar. vol. iii. p. 17. t. 232. Rather scarce (Champion! Hance!).

98. Cyninosma *resinosa*, De Cand. Prodr. vol. i. p. 722. Happy Valley woods (Champion! Hance!).

SIMARUBEÆ.

99. Brucea *Sumatrana*, Roxb., Planch. in Lond. Journ. Bot. vol. v. p. 575. Low grounds and

roadsides (Champion! Hance!); Macao (Millett!); also found at Singapore (G. Thompson!); Ceylon (G. Thompson!); Java (Zollinger!); Malacca (Griffith!); Philippine Islands (Cuming, 987 et 2426!).

STAPHYLEACEÆ.

100. Turpinia *arguta*, Seem.—*Orchanthe arguta*, Lindl. Bot. Reg. t. 1819 (December, 1835). —*Staphylea simplicifolia*, Gardn. et Champ. in Hook Journ. Bot. and Kew Misc. vol. i. p. 309.—*Eyrea vernalis*, Champ. in Hook. Journ. Bot. vol. iii. p. 331.—Planch. in Arn. Sc. Nat. vol. iv. Ser. Bot. tom. ii. p. 256. In ravines on Mount Victoria and Mount Gough (Champion! Hance!).

101. Turpinia *Napalensis*, Wall.—Wight et Arn. Prodr. vol. i. p. 156.—Wight, Icon. t. 972. Common in ravines (Champion!).

HIPPOCRATEACEÆ.

102. Hippocratea *obtusifolia*, Roxb.—Var. *pauciflora*, Benth. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 332. Frequent in ravines on Victoria Peak (Champion!).

CELASTRINEÆ.

103. Evonymus *nitidus*, Benth. (Tab. LXXXIII.); foliis ovatis obovatis oblongisve obtuse acuminatis coriaceis nitidis integerrimis, pedunculis semel bisve dichotomis folio dimidio brevioribus, floribus tetrameris, capsula 4-loculari apice breviter lobata, seminibus solitariis, arilla parva tenui.—*E. nitidus*, Benth. in Lond. Journ. Bot. vol. i. p. 483. Common in ravines (Hinds! Champion!).

A shrub; leaves 3–3½ inches long, and 1–1¼ inches broad; flowers pea-green; and capsule of a reddish colour.

Plate LXXXIII. Fig. 1, a flower-bud; 2, an open flower; 3, a petal; 4, a stamen; 5, ripe fruit:—*all magnified.*

104. Evonymus *longifolius*, Champ. in Hook. Journ. Bot. vol. iii. p. 332. Very rare in the Happy Valley woods (Champion!).

105. Evonymus *laxiflorus*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 333. Happy Valley woods, rare (Champion!).

106. Evonymus *hederaceus*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 333. In a ravine of Victoria Peak, climbing over the rocks and rooting (Champion!).

107. Celastrus *Hindsii*, Benth. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 334.—*Catha monosperma*, Roxb. et Benth.! Trailing over shrubs and trees (Hinds! Champion! Hance!).

Although Mr. Bentham stated in the Kew Journal, vol. iii. p. 334, that he looked upon his *Catha monosperma* as different from Roxburgh's, he is now convinced that they are not different from each other.

108. Celastrus *Championi*, Benth. in Hook. Journ. Bot. and Kew Misc. vol. iii. p. 334.—*Catha Benthami*, Gardn. et Champ. in Hook. l.c. vol. i. p. 310, excl. syn. Benth. Ravine of Victoria Peak (Champion!).

AQUIFOLIACEÆ.

109. Ilex *cinerea,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 327. In a ravine of Mount Victoria (Champion !).

110. Ilex *graciliflora,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 328. Common in the Happy Valley woods (Champion ! Seemann !).

111. Ilex *memecylifolia,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 328. Common on the hills (Champion !).

112. Ilex *viridis,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 329. On the hills (Champion !).

113. Ilex *asprella,* Champ. in Hook. Journ. Bot. and Kew Misc. vol iv. p. 329.—*Prinos asprellus,* Hook. et Arn. Bot. Beech. p. 176. t. 36 ! Victoria Peak and Little Hongkong (Champion ! Hance !).

114. Ilex *pubescens,* Hook. et Arn. Bot. Beech. p. 176. t. 35. Happy Valley woods (Champion ! Hance ! Seemann !).

RHAMNEÆ.

115. Paliurus *Aubletii,* Schult. Syst. vol. v. p. 343. According to Hance, wild in Hongkong; also on Dane's Island, Whampoa (Hance !).

116. Ventilago *Maderaspatana,* Gærtn.—Wight et Arn. Prodr. vol. i. p. 163. Ravines (Champion ! Hance !).

117. Berchemia *lineata,* De Cand. Prodr. vol. ii. p. 23. Ravines (Champion ! Hance ! Seemann !).

118. Sagretia *theezans,* Brongn.—*Rhamnus theezans,* Linn., De Cand. Prodr. vol. ii. p. 26. Ravines (Champion ! Hance !); Macao (Millett !); Philippine Islands (Cuming, n. 1108).

119. Rhamnus *virgatus,* Roxb. Fl. Ind. ed. Car. et Wall. vol. ii. p. 351. Victoria Peak (Champion !).

Zizyphus vulgaris, Lam., is cultivated in Hongkong.

TEREBINTHACEÆ.

120. Rhus *succedaneum,* Linn.—Wight, Icon. t. 560. Happy Valley (Champion ! Hance !).

121. Rhus *hypoleuca,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 43. Mount Gough (Champion ! Hance ! Seemann !).

122. Mangifera *Indica,* Linn., De Cand. Prodr. vol. ii. p. 63. Cultivated.

123. Canarium *Pimela,* Kœnig, De Cand. Prodr. vol. ii. p. 80. In woods (Hance !).

CONNARACEÆ.

124. Rourea *santaloides,* Wight et Arn. Prodr. vol. i. p. 144.—*R. Millettii,* Planch. Linn. vol.

xxiii. p. 420!—*Connarus Roxburghii,* Hook. et Arn. Bot. Beech. p. 179 (excl. syn. Roxb.)! Abundant in the ravines (Hance!); also found at Macao and Canton (Millett! Lay and Collie!).

125. Rourea *microphylla,* Planch. Linn. vol. xxiii. p. 421.—*Connarus microphyllus,* Hook. et Arn. Bot. Beech. p. 421.—*Averrhoa Sinica,* Hance in Wlprs. Ann. vol. ii. p. 241, et vol. iii. p. 839! Abundant in the ravines (Champion! Hance! Seemann!).

LEGUMINOSÆ.

I. Papilionaceæ.

126. Crotalaria *calycina,* Schrank.—Benth. in Lond. Journ. Bot. vol. ii. p. 564. Near Chekchow (Eyre! Hance!).

127. Crotalaria *brevipes,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 44. In sandy soil, at the borders of an estuary at East Point (Champion!).

128. Crotalaria *albida,* Heyne.—Benth. in Lond. Journ. Bot. vol. ii. p. 567. Victoria Peak, and other localities (Hance! Champion!).

Crotalaria *verrucosa,* Linn., *C. retusa,* L., and *C. fulva,* Roxb., are cultivated in the gardens.

129. Indigofera *Anil,* Linn., De Cand. Prodr. vol. ii. p. 225. In waste places, on roadsides, etc. (Hance! Seemann!).

130. Indigofera *hirsuta,* Linn.—De Cand. Prodr. vol. ii. p. 228. On the racecourse (Champion! Hance!).

131. Indigofera *venulosa,* Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 44. Victoria Peak (Champion); gathered also at Silver Island (Fortune, n. 43!).

132. Indigofera *decora,* Lindl., Wlprs. Ann. vol. i. p. 230. East Point (Eyre!).

133. Tephrosia *purpurea,* Pers., De Cand. Prodr. vol. ii. p. 251. East Point (Champion!).

134. Æschynomene *Indica,* Linn., De Cand. vol. ii. p. 320. Estuary at East Point (Champion! Hance!).

135. Zornia *diphylla,* Pers., De Cand. Prodr. vol. ii. p. 316. East Point (Champion! Hance!).

"Bentham's remarks about *Zornia diphylla,* in Hook. Journ. and Kew Misc. vol. iv. p. 45 (I mean the absence of pellucid dots), are inaccurate, as I have satisfied myself by living specimens."—Hance in Bonp. vol. ii. p. 121. Hance's dried specimens also have dots.

136. Alsicarpus *vaginalis,* De Cand. Prodr. vol. ii. p. 353. Hongkong (Hance!); a single specimen only.

137. Uraria *crinita,* Desv., *β. macrostachya,* Benth. in Hook. Journ. and Kew Misc. vol. iv. 45. Common near the Albany Barracks (Champion! Hance!).

138. Pteroloma *triquetrum,* Desv.—*Desmodium triquetrum,* De Cand. Prodr. vol. ii. p. 326. Victoria Peak (Champion! Hance!).

139. Phyllodium *pulchellum*, Desv.—*Dicerma pulchellum*, De Cand. Prodr. vol. ii. p. 339. East Point (Champion! Hance! Seemann!).

140. Phyllodium *elegans*, Benth.—*Dicerma elegans*, De Cand. Prodr. vol. ii. p. 339. Common on low grounds (Champion!).

141. Desmodium *polycarpum*, De Cand. Prodr. vol. ii. p. 334.—*D. nervosum*, Th. Vogel, Pl. Meyen. p. 28!—*D. acrocarpum*, Hance in Hook. Lond. Journ. Bot. vol. vii. p. 414! Common throughout the Island (Champion! Eyre! Hance!).

142. Desmodium *reticulatum*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 46. Hongkong, precise locality not noticed (Champion!).

143. Lespedezia *cuneata*, G. Don, Gard. Dict. vol. ii. p. 307.—*L. juncea*, De Cand. Prodr. vol. ii. p. 348 (excl. syn. Linn., Pers., et Thunb.), et eo teste *Anthyllis cuneata*, Dum. Cours. Rari.—*Hedysarum junceum*, Roxb. non Linn. East Point (Champion! Hance!); also collected at Shanghai (Fabre Tonnerre!).

144. Lespedezia *viatorum*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 47. Common about Little Hongkong (Champion! Hance!).

145. Neustanthus *phaseoloides*, Benth.—*Dolichos phaseoloides*, Roxb.—*D. viridis*, Ham.—*Phaseolus decurrens*, Grah. Climbing over shrubs (Champion! Hance!).

146. Canavalia *gladiata*, De Cand. Prodr. vol. ii. p. 404. Climbing over shrubs and trees (Hance! Seemann!).

147. Mucuna (Citta) *macrobotrys*, Hance in Wlprs. Ann. vol. ii. p. 422.—*M. Championi*, Benth. in Hook. Journ. Bot. vol. iv. p. 49! Above the Buddhist Temple at East Point, climbing over rocks and trees (Champion! Hance!).

Hance's name is the oldest, and therefore adopted.

148. Cajanus *bicolor*, De Cand. Prodr. vol. ii. p. 406. Hongkong (Hance!); also at Whampoa (Hance!).

149. Antylosia *scarabæoides*, Benth.—*Cantharospermum pauciflorum*, Wight et Arn. Prodr. vol. i. p. 255. On roadsides (Champion! Hance!).

150. Pycnospora *hedysaroides*, R. Brown.—*P. nervosa*, Wight et Arn. Prodr. vol. i. p. 197. Hongkong (Champion!).

151. Rynchosia *volubilis*, Lour.?—Hook. et Arn. Bot. Beech. p. 181. Climbing over shrubs and trees (Champion!); also at Whampoa (Hance!).

152. Abrus *precatorius*, Linn., De Cand. Prodr. vol. ii. p. 381. Hongkong (Hance!).

153. Eriosema *Chinense*, Th. Vogel, Leg. Meyen. p. 31. Victoria Peak (Champion! Hance!).

154. Millettia *speciosa*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 73. Victoria Peak (Champion! Hance!).

155. Millettia *nitida*, Benth. in Lond. Journ. Bot. vol. i. p. 484. Very common, from the level of the sea to the summit of Victoria Peak (Champion!).

156. Millettia *Championi,* Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 74. Trailing over rocks on Mount Gough and the Happy Valley woods (Champion! Hance!).

157. Dalbergia *polyphylla,* Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 75. Summit of Mount Gough (Champion!); also in the Philippine Islands (Cuming!).

158. Sophora *Japonica,* Linn., De Cand. Prod. vol. ii. p. 95. Hongkong (Hance!); also collected in other parts of China by Millett and Fortune (n. 35).

159. Bowringia *callicarpa,* Benth. in Hook. Journ. and Kew Misc. vol iv. p. 75. Ravines of Victoria Peak (Champion! Hance!).

160. Ormosia *pachycarpa,* Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 76. Happy Valley woods and elsewhere (Champion! Hance!).

161. Ormosia *emarginata,* Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 77.—*Layia emarginata,* Hook. et Arn. Bot. Beech. p. 183. t. 38. Common in the Happy Valley woods and elsewhere (Champion! Hance!).

II. Cæsalpinieæ.

162. Guilandina *Bonduc,* Ait., De Cand. Prodr. vol. ii. p. 480. On the sea-shore (Hance!).

163. Cæsalpinia *Chinensis,* Roxb. Fl. Ind. vol. ii. p. 361. Common in ravines, especially towards West Point (Champion! Hance!); also collected in other parts of China by Millett and Fortune (n. A. 123!).

"The leaves have the smell of Mace."—Hance, mss.

164. Cæsalpinia *vernalis,* Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 77. On the banks of a stream towards Little Hongkong (Champion! Hance!).

165. Cassia *occidentalis,* Linn., De Cand. Prodr. vol. ii. p. 497. In waste places (Hance!).

166. Cassia *angustissima,* Lam.—*C. mimosoides,* Linn., var. β, Vog. Syn. Cass. p. 69. Victoria Peak and other localities (Champion! Hance!).

C. tomentosa, Linn., is cultivated in Hongkong (Hance!), and, according to Colonel Eyre, one of the most common ornamental trees in China; found everywhere about the villages.

167. Phanera *corymbosa,* Benth.—*Bauhinia corymbosa,* Roxb., De Cand. Leg. Mem. t. 70. About East Point (Champion! Hance!).

168. Phanera *Championi,* Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 78. Ravines of Victoria Peak, at East Point (Champion! Hance!).

169. Gleditschia *Sinensis,* Lam.? Victoria Peak (Champion!, who collected a mere fragment).

III. Mimoseæ.

170. Acacia? *concinna,* De Cand.? Prodr. vol. ii. p. 464. Happy Valley (Champion! Hance!). The leaves are wanting.

171. Acacia *Farnesiana*, Willd., De Cand. Prodr. vol. ii. p. 461. Common about the houses (Hance!).

172. Albizzia *Milletti*, Benth. in Hook. Journ. Bot. vol. iii. p. 59. Happy Valley (Hance! Champion!).

173. Albizzia? *Championi*, Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 79. In woods (Hance! Champion!).

174. Albizzia *stipulata*, Benth., Wlprs. Rep. vol. i. p. 925, vol. v. p. 598. Hongkong (Hance!).

Mimosa pudica, L., is cultivated in the gardens; also *Poinciana pulcherrima*, L., *Bauhinia variegata*, L., *Pisum sativum*, L., etc. etc.

ROSACEÆ.

175. Eriobotrya *fragrans*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 80. Very scarce in a ravine on Mount Victoria (Champion!).

176. Eriobotrya *Japonica*, Lindl., De Cand. Prodr. vol. ii. p. 631. Nomen vernacul. "Loquat." Cultivated on account of its edible fruit (Hance! Seemann! Champion!).

177. Photinia *serrulata*, Lindl., De Cand. Prodr. vol. ii. p. 631. Cultivated (Hance!).

178. Photinia *prunifolia*, Lindl. Bot. Reg. t. 1956. Common in the Happy Valley woods (Champion!).

179. Raphiolepis *rubra*, Lindl. Collect. t. 3.—*R. phæotemon*, Lindl. l. c.? Common all over the Island (Champion! Hance!).

180. Rosa *multiflora*, Thunb., De Cand. Prodr. vol. ii. p. 598. On the hills (Hinds! Hance!).

181. Rubus *leucanthus*, Hance in Wlprs. Ann. vol. ii. p. 468.—*R. glaberrimus*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 80! In ravines of the hills (Champion! Hance!).

Dr. Hance's name has the right of priority.

182. Rubus *reflexus*, De Cand. Prodr. vol. ii. p. 566. In ravines on the hills, very common. (Champion! Hance! Seemann!).

183. Rubus *parvifolius*, Linn., De Cand. Prodr. vol. ii. p. 564. In ravines of the hills (Champion! Hance! Seemann!).

Rubus rosæfolius, Smith (*R. Javanicus*, Bl.) fl. pleno, *Spiræa Reevesiana*, Lindl., and several species of Roses, are cultivated in the gardens; *Rosa Sinica*, Ait. (*nivea*, DC.), was collected by Hance at Macao.

RHIZOPHOREÆ.

184. Kandelia *Rheedii*, Wight et Arn.—Arn. in Ann. Nat. Hist. vol. i. p. 365. In an estuary at Little Hongkong (Champion!).

185. Carallia *Sinensis*, Arn. in Nova Act. Nat. Cur. vol. xviii. p. 335. Very rare, in a ravine on Mount Victoria (Champion!).

ONAGRARIÆ.

186. Jussiæa *villosa*, Lam.—Wight et Arn. Prodr. vol. i. p. 336.—*J. fruticosa*, De Cand. Prodr. vol. iii. p. 57. In swamps (Champion! Hance!).

187. Ludwigia *parviflora*, Roxb.—Wight et Arn. Prodr. vol. i. p. 336.—*L. stagnalis*, Hance in Wlprs. Ann. vol. ii. p. 531! In swamps (Hance! Champion!).

188. Trapa *bicornis*, Linn., De Cand. Prodr. vol. iii. p. 64. Cultivated on account of its fruit (Hance!).

Some of the fruits have *three* horns.

HALORAGEÆ.

189. Goniocarpus *scaber*, Kœnig, De Cand. Prodr. vol. iii. p. 65. Common on grassy slopes, Victoria Peak, etc. (Champion! Hance!).

LYTHRARIEÆ.

190. Ammannia *subspicata*, Benth. in Lond. Journ. Bot. vol. i. p. 484. Common in ditches (Champion! Hance! Hinds!).

191. Lagerstrœmia *Indica*, Linn., var. *pallida*, Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 81. Wild in the woods near the Buddhist Temple (Champion!).

The ordinary variety of this species, and *Lawsonia alba*, Lam., are cultivated in the gardens.

MELASTOMACEÆ.

192. Melastoma *repens*, Lamk., Naud. in Ann. Sc. Nat. Par. ser. 3. vol. xiii. p. 274.—*Osbeckia repens*, De Cand. vol. iii. p. 142. Common on all the hills (Champion! Hance! Seemann! Eyre!).

193. Melastoma *candidum*, D. Don, De Cand. Prodr. vol. iii. p. 145.—*M. calycinum*, Bth. in Hook. Journ. Bot. vol. i. p. 485! On the hills (Champion! Hinds! Hance! Seemann!).

194. Melastoma *macrocarpum*, Don, Naud. in Ann. Sc. Nat. Par. ser. 3. vol. xiii. p. 281. On the hills (Champion! Hance! Seemann!).

195. Melastoma *sanguineum*, Sims, Bot. Mag. t. 2241. On the hills and in woods (Champion! Hance! Seemann!).

196. Osbeckia *Chinensis*, Linn. Spec. p. 490, excl. syn. Pluk., non Auct. plur. De Cand. Prodr. vol. iii. p. 141.—*O. linearis*, Blume, Naud. l. c. vol. xiv. p. 70. In ravines (Champion! Hance! Seemann!).

197. Allomorphia *pauciflora*, Benth. in Hook. Lond. Journ. Bot. vol. i. p. 485. In Hongkong (Hinds!).

198. Memecylon *scutellatum*, Hook. et Arn. Bot. Beech. p. 186, excl. syn. Lour.—*M. ligustrifolium*, Champ. in Hook. Journ. of Bot. and Kew Misc. vol. iv. p. 117! Happy Valley woods (Seemann! Hance! Champion!).

MYRTACEÆ.

199. Bæckia *frutescens*, Linn., De Cand. Prodr. vol. iii. p. 229. Gregarious on bare hills, Mounts Gough and Victoria (Champion! Hance! Seemann!).

200. Syzygium *buxifolium*, Hook. et Arn. Bot. Beech. p. 187. In the ravines (Champion! Hance! Seemann!).

201. Syzygium *odoratum*, Hook. et Arn. Bot. Beech. p. 187. Happy Valley woods (Champion!).

202. Syzygium *nervosum*, De Cand. Prodr. vol. iii. p. 260.—*Calyptranthes mangiferifolia*, Hance in Wlprs. Ann. vol. ii. p. 629! Near the Albany Barracks (Champion!); cultivated in the Island (Hance!).

203. Acmena *Championi*, Bth. in Hook. Journ. of Bot. and Kew Misc. vol. iv. p. 118.—*Memecylon nigrescens*, Hook. et Arn. Bot. Beech. p. 186??. Near the waterfall of the Happy Valley (Champion!).

I strongly suspect that these two names belong to one plant; but of *A. Championi* the flowers are unknown, and of *Memecylon nigrescens* the fruit; besides, the specimens of the latter appear to be in a diseased state.

204. Jambosa *vulgaris*, De Cand. Prodr. vol. iii. p. 286.—*Eugenia Jambos*, Linn. Cultivated on account of its edible fruit, and partly naturalized (Champion! Hance!); according to Eyre, common in the woods.

205. Psidium *Guaiava*, Raddi, supra, p. 125. On roadsides, near habitations (Hance! Seemann!).

206. Myrtus (Rhodomyrtus) *tomentosa*, Ait., De Cand. Prodr. vol. iii. p. 240.—Abundant on all the hills. The fruit has the taste of Allspice.

Myrtus communis, L., and *Punica Granatum*, L., are cultivated in the gardens.

HOMALINEÆ.

207. Blackwellia *fagifolia*, Lindl. in Hort. Trans. vol. vi. p. 269.—*B. padifolia*, Lindl. Bot. Reg. t. 1308!—*B. Loureiri*, Bth. in Lond. Journ. of Bot. vol. i. p. 482! Happy Valley woods (Champion! Hance! Seemann!).

CUCURBITACEÆ.

208. Zehneria *Mysorensis*, Arn.—*Bryonia Mysorensis*, Klein, Wight, Icon. vol. iii. t. 758!—*B. Hookeriana*, Wight et Arn. Prodr. vol. i. p. 345!—*Harlandia bryonioides*, Hance in Wlprs. Ann. vol. ii. p. 648! In woods (Hance!).

The plant described by Dr. Hance is merely one of the glabrous forms (male) of the extremely variable *Zehneria Mysorensis*, Arn., connected with the more hairy ones by numerous intermediate states. How far it is related to *Bryonia umbellata*, Wight et Arn., remains yet to be investigated.

209. Momordica *Charantia*, Linn., Wight et Arn. Prodr. vol. i. p. 348. Semispontaneous, climbing over shrubs (Hance!); also found by Millett in Southern China.

210. Citrullus *vulgaris*, Schrad.—*Cucumis Citrullus*, Ser. in De Cand. Prodr. vol. iii. p. 301. —*Cucurbita Citrullus*, Linn. In sunny places (Hance!).

Luffa acutangula, Roxb., *Coccinia Indica*, Wight et Arn., Melons, Cucumbers, and other esculent *Cucurbitaceæ*, commonly found in the Tropics, are grown in Hongkong; *Trichosanthes dioica*, Roxb. (*T. Chinensis*, Ser. ?) is cultivated at Whampoa.*

PAPAYACEÆ.

211. Carica *Papaya*, Linn. Cultivated on account of its edible fruit (Hance! Seemann!).

BEGONIACEÆ.

212. Doratometra *Bowringiana*, Seem.—*Begonia Bowringiana*, Champ. in Hook. Journ. of Bot. and Kew Misc. vol. iv. p. 120! In half-shady places (Champion! Hance!).

CRASSULACEÆ.

213. Bryophyllum *calycinum*, Salisb., De Cand. Prodr. vol. iii. p. 396. In waste places (Hance! Hinds!).

SAXIFRAGACEÆ.

214. Adamia *versicolor*, Fortune in Journ. Hort. Soc. vol. i. p. 298. Lindl. in Paxt. Flow. Gard. t. 5.—*A. Chinensis*, Gardn. et Champ. in Hook. Journ. of Bot. and Kew Misc. vol. i. p. 311! Ravines of Mounts Victoria and Parker (Champion! Hance!).

215. Itea *Chinensis*, Hook. et Arn. Bot. Beech. p. 189. t. 39. Happy Valley, on the outskirts of the woods at the top of the ridge (Champion! Hance!).

PORTULACEÆ.

216. Portulaca *oleracea*, Linn., De Cand. Prodr. vol. iii. p. 353. On roadsides and in waste places (Hance!).

PARONYCHIEÆ.

217. Polycarpæa *corymbosa*, Lam.—Wight et Arn. Prodr. vol. i. p. 358. Hongkong (Hance!); also at Macao (Vachell!).

UMBELLIFERÆ.

218. Hydrocotyle *Asiatica*, Linn., De Cand. Prodr. vol. iv. p. 62.—*H. lurida*, Hance in Wlprs. Ann. vol. ii. p. 690! In swampy meadows (Hance!), in ricefields (Champion!).

219. Hydrocotyle *rotundifolia*, Roxb., De Cand. Prodr. vol. iv. p. 64.—*H. perexigua*, Hance in Wlprs. Ann. vol. ii. p. 691! In damp, half-shady places (Hance); in ricefields (Champion!).

Coriandrum sativum, L., and the Fennel (*Fœniculum vulgare*, Gærtn.) are cultivated.

* *Passiflora fœtida*, Cav., is cultivated in the gardens, but not wild in the Island.

ARALIACEÆ.

220. Aralia *Chinensis*, Linn., De Cand. Prodr. vol. iv. p. 259. Scarce in the Island (Champion !).

221. Paratropia *Cantoniensis*, Hook. et Arn. Bot. Beech. p. 189. Happy Valley woods (Seemann !) ; common also in other parts of the Island (Champion ! Hance !).

222. Hedera *parviflora*, Champ. in Hook. Journ. of Bot. and Kew Misc. vol. iv. p. 122. Precise station not recorded (Champion !).

223. Hedera *protea*, Champ. l. c. p. 122. Ravines of Mounts Gough and Victoria (Champion !).

Panax aculeatum, Ait., is common at Cowlung, opposite Hongkong (Seemann, n. 2457), but has not been found in the Island.

LORANTHACEÆ.

224. Viscum *orientale*, Willd., De Cand. Prodr. vol. iv. p. 278. Upon trees in the Happy Valley (Seemann ! Hance ! Champion !).

225. Viscum *moniliforme*, Blume, Wight et Arn. Prodr. vol. i. p. 380. Happy Valley, scarce (Champion !).

226. Loranthus *Scurrula*, Linn. Sp. Pl. p. 472 ?, non Roxb.—*L. Chinensis*, De Cand. Prodr. vol. iv. p. 301. Upon trees (Champion !).

HAMAMELIDEÆ.

227. Rhodoleia *Championi*, Hook. Bot. Mag. t. 4509. Hance in Wlprs. Ann. vol. iii. p. 842. Happy Valley woods (Champion !).

228. Liquidambar *Chinense*, Champ. (Tab. XCIV.) ; foliis ovali-oblongis vix acuminatis calloso-serratis in petiolum brevem angustatis coriaceis, racemis terminalibus, amentis superioribus masculis ovoideis infimo fœmineo longius pedicellato globoso.—*L. Chinense*, Champ. in Hook. Journ. of Bot. and Kew Misc. vol. iv. p. 164. Wong-ny-Chung Valley woods (Champion ! Hance !).

The species mentioned by Siebold as occurring in Japan is probably identical with this, and not with *L. Altingiana*, Bl. (*Sedgwickia cerasifolia*, Griff.). *L. Chinense* is a high tree, with leaves 3–4 inches long, and 1–2 inches broad, distinguished from *L. Altingiana* by its coriaceous leaves, narrowed at the base into a very short petiole.

Plate XCIV. Fig. 1, a branch, with a raceme of male flowers ; 2, a catkin of male flowers ; 3, section of the same ; 4 and 5, anthers ; 6, pistil ; 7, section of ovary ; 8, section of female catkin, in fruit ; 9, a ripe fruit ; 10 and 11, seeds :—*all*, with exception of fig. 1, *magnified*.

229. Eustigma *oblongifolium*, Gardn. et Champ. (Tab. XCV.) ; foliis alternis petiolatis coriaceis oblongis acuminatis versus apicem grosse dentatis penniveniis glabris, stipulis parvis subulatis deciduis, pedunculis terminalibus stellato-tomentosis, floribus laxe capitatis pedicellatis pedicellis tribracteolatis. —*E. oblongifolium*, Gardn. et Champ. in Hook. Journ. of Bot. and Kew Misc. vol. i. p. 312. Happy Valley woods, Mounts Gough and Victoria, and Black Mountain (Champion !).

Though Gardner and Champion, in their description of *Eustigma*, correctly state that it has no corolla, yet they speak of "Stamina 5, cum petalis inserta, iisdem alterna," a *lapsus pennæ*, which probably had its origin in the five scales being looked upon as petals, and catalogued as such in the first draft of the generic character. The stamens are inserted in the throat, and opposite the lobes of the calyx.

A small tree; leaves 4–4½ inches long, and 18–21 lines broad.

PLATE XCV. Fig. 1, an entire flower, with the bracts; 2, ditto, with bracts removed, calycinal leaves laid open, and styles cut off; 3, one of the scales; 4 and 5, anthers; 6 and 7, sections of ovary; 8, stellate hair covering various parts of the flower; 9, bunch of ripe fruit; 10, capsule, not quite ripe; 11, section of ditto; 12, a capsule after the dehiscence:—*all*, with the exception of fig. 9, *magnified*.

CORNEÆ.

230. BENTHAMIA *Japonica*, Sieb. et Zucc., var. *Sinensis*, Bth. in Hook. Journ. of Bot. and Kew Misc. vol. iv. p. 165. Happy Valley woods, extremely rare (Champion!).

231. MARLEA *begoniæfolia*, Roxb., De Cand. Prodr. vol. iv. p. 267. Happy Valley woods (Champion! Seemann!).

CAPRIFOLIACEÆ.

232. VIBURNUM *nervosum*, Hook. et Arn. Bot. Beech. p. 190. Mounts Victoria and Gough, common (Hance! Champion! Seemann!).

233. VIBURNUM *odoratissimum*, Ker? De Cand.? Hook. et Arn. Bot. Beech. p. 190. Hongkong; also on the mainland of China, where it is common (Champion!).

234. LONICERA *longiflora*, De Cand. Prodr. vol. iv. p. 333. Largely distributed over the Island (Champion!).

235. LONICERA *hirtiflora*, Champ. in Hook. Journ. of Bot. and Kew Misc. vol. iv. p. 166. On the hills (Champion! Hance!).

236. LONICERA *reticulata*, Champ. in Hook. Journ. of Bot. and Kew Misc. vol. iv. p. 167. On the summits of hills, in grass or amongst rocks (Champion!).

237. LONICERA *multiflora*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 167. From Mr. Cay's garden in Hongkong, and, according to him, indigenous in the Island (Champion!).

RUBIACEÆ.

Subordo I. COFFEACEÆ.

238. GALIUM *Aparine*, Linn., De Cand. Prodr. vol. iv. p. 608.—*G. sororium*, Hance in Wlprs. Ann. vol. ii. p. 734! In hedges (Hance!).

239. BORRERIA *discolor*, Bartl., De Cand. Prodr. vol. iv. p. 545! Hongkong (Champion!).

240. SPERMACOCE *hispida*, Linn., De Cand. Prodr. vol. iv. p. 555. In waste places (Champion!).

241. KNOXIA *corymbosa*, Willd., Wight et Arn. Prodr. vol. i. p. 439. Hongkong (Champion!).

242. PSYCHOTRIA *elliptica*, Ker, De Cand. Prodr. vol. iv. p. 490.—*P. Reevesii*, Wall., De Cand. l. c. p. 519.—*Grumilia Reevesii*, Hook. et Arn. Bot. Beech. p. 193. Very common (Hance! Champion!).

243. Psychotria *serpens*, Linn., De Cand. Prodr. vol. iv. p. 519.—*P. scandens*, Hook. et Arn. Bot. Beech. p. 193. Common, creeping over rocks (Seemann! Hance! Champion!).

244. Pavetta *Indica*, Linn., De Cand. Prodr. vol. iv. p. 490. Happy Valley and West Point (Hance! Champion!).

245. Ixora *stricta*, var. *incarnata*, Roxb. Fl. Ind. vol. i. p. 379, ejusd. ed. Wall. p. 389. Woods near the Buddhist Temple, East Point (Champion! Hance!).

246. Canthium *undulatum*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 198. Happy Valley woods, rare (Champion!).

247. Diplospora *viridiflora*, De Cand. Prodr. vol. iv. p. 477.—*Gardenia daphnoides*, Hance in Wlprs. Ann. vol. ii. p. 796! Victoria Peak, common (Champion! Hance! Seemann!).

248. Pæderia *fœtida*, Linn., De Cand. Prodr. vol. iv. p. 471. Mount Victoria (Champion! Hance!); also found at Dane's Island, Whampoa (Hance!).

249. Morinda *umbellata*, Linn., var.?—Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 196. Common (Hance! Champion!).

250. Guettardella *Chinensis*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 197. Mounts Gough and Victoria (Champion!).

251. Mephitidia (§ Lasianthus) *Chinensis*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 196. Wong-ny-Chung Valley, Victoria Peak, etc. (Champion! Hance!).

Subordo II. Cinchonaceæ.

252. Hedyotis *hispida*, Retz, De Cand. Prodr. vol. iv. p. 420. On roadsides (Hance!).

253. Hedyotis *borrerioides*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 171. Common in the neighbourhood of Chuckchew (Champion!).

254. Hedyotis (§ Macrandia) *recurva*, Benth. (Tab. LXXXIV.); glabra, etsi tactu scabriuscula, ramis teretibus vel leviter tetragonis, stipulis utrinque longe et rigide plurisetis, foliis ovato-lanceolatis, umbellis multifloris, in axillis superioribus pedunculatis, ad apicem caulis paniculam oblongam constituentibus, calycis dentibus corollæque lobis recurvis, capsula dicocca.—*H. recurva*, Benth. in Hook. Lond. Journ. Bot. vol. i. p. 486, et Hook. Journ. Bot. and Kew Misc. vol. iv. p. 170. Abundant in the ravines (Hance! Champion! Seemann!); also gathered by Fortune, n. 53.

An herbaceous plant; leaves 2–2½ inches long, and about 9 lines broad.

Plate LXXXIV. Fig. 1, an entire flower; 2, portion of corolla; 3, pistil; 4 and 5, sections of ovary; 6, head of ripe fruits; 7, a ripe fruit; 8, seeds:—*all*, with exception of 6, *magnified*.

255. Hedyotis (§ Diplophragma) *acutangula*, Champ. (Tab. LXXXV.); suffruticosa, glabra, caule erecto acute tetragono v. alato, stipulis triangularibus, foliis ovato-lanceolatis subsessilibus crassiusculis paucivenis, cymis 2–3-chotomis paniculatis, calycibus sessilibus, dentibus brevibus obtusis, corollæ tubo exserto lobis longiore, capsulæ coccis intus hiantibus.—*H. acutangula*, Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 171.—Common in the ravines (Hance! Seemann! Champion!).

A half-shrubby plant, about 2 feet high; leaves 2–3 inches long, and about 6 lines broad; flowers whitish.

PLATE LXXXV. Fig. 1, an entire flower; 2, corolla, laid open; 3, a stamen; 4, section of ovary and the style; 5, a branch, with ripe fruit; 6, ripe fruit; 7 and 8, sections of the same; 9, a seed:—*all*, with the exception of fig. 5, *magnified*.

256. OLDENLANDIA *corymbosa*, Linn., De Cand. Prodr. vol. iv. p. 426. In ravines (Champion!).

257. SCLEROMITRION *angustifolium*, Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 172.—*Hedyotis angustifolia*, Cham. et Schlecht., De Cand. Prodr. vol. iv. p. 419. In ravines (Hance! Champion!).

258. OPHIORRHIZA *pumila*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 169. Ravines of Mount Victoria (Hance! Champion!).

259. OPHIORRHIZA *Eyrii*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 170. In sheltered ravines, near water (Eyre! Hance!).

260. THYSANOSPERMUM *diffusum*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 168. On rocks, in ravines; abundant on Mount Victoria (Champion!).

261. ADINA *globiflora*, Salisb., De Cand. Prodr. vol. iv. p. 349. Ravines towards West Point, at the waterfall in the Happy Valley, and other localities (Champion! Eyre! Hance!).

262. STYLOCORYNE *Webera*, A. Rich.—Wight et Arn. Prodr. vol. i. p. 401. Happy Valley, scarce (Champion! Hance!).

263. STYLOCORYNE *mollissima*, Wlprs. Rep. vol. ii. p. 517. Happy Valley woods, Mount Victoria, and Buddhist Temple (Champion!).

264. RANDIA *dumetorum*, Lam., De Cand. Prodr. vol. iv. p. 385. Little Hongkong (Hance! Champion!).

265. RANDIA *Sinensis*, Rœm. et Schlecht.?—Hook. et Arn. Bot. Beech. p. 191. Little Hongkong (Champion!); abundant on hills (Eyre!); also at Macao (Eyre!).

266. RANDIA? *leucocarpa*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 194. Top of Victoria Peak (Champion! Hance!).

267. RANDIA? *canthioides*, Champ. l. c. p. 194. Ravines of Mount Victoria (Champion! Hance!).

268. GARDENIA *florida*, Linn., De Cand. Prodr. vol. iv. p. 379. Mount Gough, Mount Victoria, and other localities (Champion! Hance! Seemann!).

269. MUSSÆNDA *pubescens*, Ait., De Cand. Prodr. vol. iv. p. 371. Common in the ravines (Champion! Hance!).

270. MUSSÆNDA *erosa*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 193. Happy Valley (Champion!).

Gardenia florida, L., et var. fl. pleno, several species of *Ixora*, and *Serissa fœtida*, Comm., are cultivated in the gardens.

LOGANIACEÆ.

271. Gelsemium *elegans*, Benth. in Journ. Linn. Soc. vol. i. p. 90.—*Medicia elegans*, Gardn.—*Leptopteris Sumatrana*, Blume. Scarce in Hongkong, but more abundant on the opposite coast (Champion!).

272. Mitrasacme *capillaris*, Wall., De Cand. Prodr. vol. ix. p. 11.—*M. Malaccensis*, Wight, Ic. t. 1601. f. 2.—*Limnophila campanuloides*, Wall. Cat. n. 3908. Stony places towards West Point; rare in Hongkong (Champion).

273. Strychnos *paniculata*, Champ. in Hook. Journ. and Kew Misc. vol. v. p. 56. Woods in the Happy Valley (Champion!).

274. Strychnos *angustiflora*, Benth. in Journ. Linn. Soc. vol. i. p. 102. Happy Valley (Champion! Hinds! Seemann! Hance!).

275. Buddleia *Lindleyana*, Fortune (?).—De Cand. l. c. p. 446. Ravines south of Victoria Peak (Eyre!).

276. Gærtnera (§ Sykesia, *Benth.*) *Hongkongensis*, Seem.; foliis obovato-oblongis obtusis in petiolum angustatis, vaginis stipulaceis apice aristato-dentiferis, paniculæ ramis (in exemplare monstrose?) in folia abeuntibus, corollæ lobis tubo suo longioribus, antheris exsertis.—*Leuconotis*, sp. nov.? Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 333! Hongkong (Eyre!).

A more perfect, though still apparently monstrous specimen of this singular plant than was at Mr. Bentham's command has come to hand, proving it to belong, as a new species, to *Gærtnera*.

COMPOSITÆ.

(*Auctore J. Steetz.*)

Tribus I. Vernoniaceæ.

277. Vernonia (Tephrodes) *cinerea*, Less. in Linn. vol. iv. p. 291. n. 66, vol. vi. p. 673. n. 128.—De Cand. Prodr. vol. v. p. 24. n. 52. In Hongkong (Hinds, Champion, teste cl. Benth.; Hance! Seemann!).

The specimens of this most variable species belong all to the ordinary form.

278. Vernonia (Strobocalyx) *solanifolia*, Benth. in Lond. Journ. Bot. vol. i. p. 486, et Hook. Journ. Bot. and Kew Misc. vol. iv. p. 232. n. 3.—*V. Fortunei*, C. H. Schultz, mss. in Pl. Fortun. exsicc. n. 175! Abundant on the hills (Hinds, Champion, teste cl. Benth.; Hance! Seemann! Fortune!).

The capitula are not quite developed, but there is no doubt that the specimens belong to this remarkable species.

279. Vernonia (Lepidaploa) *Cumingiana*, Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 232+.* Victoria Peak (Champion, teste cl. Benth.).

* Of all the species to which this + is affixed, I have not seen specimens, but have merely taken them up from Bentham's enumeration.—*J. Steetz.*

280. Cyanopis *pubescens*, Blume, De Cand. Prodr. vol. v. p. 69. n. 2. Hongkong (Champion, teste cl. Benth.; Hance! Seemann!).

281. Elephantopus *scaber*, Linn., De Cand. Prodr. vol. v. p. 86. n. 1. In waste places (Champion, teste cl. Benth.; Hance!).

Tribus II. Eupatoriaceæ.

282. Ageratum *conyzoides*, Linn., De Cand. Prodr. vol. v. p. 108. n. 1. Hongkong (Hance! Seemann!).

283. Eupatorium *Reevesii*, Wall., De Cand. Prodr. vol. v. p. 179. n. 251+.—*E. Fortunei*, Turcz.—Hongkong (Champion, teste cl. Benth.); North of China (Fortune, n. 20!).

284. Eupatorium *Lindleyanum*, De Cand. Prodr. vol. v. p. 180. n. 254. Victoria Peak (Champion, teste cl. Benth.; Hance! Seemann!).

The leaves of our specimens are scabrous on both sides, and densely punctate beneath; their margin is very sharp, characters not mentioned by De Candolle, whose brief diagnosis in all other respects agrees well.

Tribus III. Asteroideæ.

285. Aster (Orthomeris) *striatus*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 233+. Hongkong (Champion, teste cl. Benth.).

286. Aster (Orthomeris, *Torr. et Gray*) *Benthami*, Steetz.—*Diplopappus laxus*, Benth. in Lond. Journ. Bot. vol. i. p. 487, et in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 223. n. 10.—Wlprs. Rep. Bot. Syst. vol. ii. p. 578. n. 8.—*Amphirhapis Chinensis*, C. H. Schultz, Bip.! mss. in Pl. Fortunei exsicc. n. 110. On rather barren hills (Hinds, Champion, teste cl. Benth.; Hance!); also at Shanghai (C. F. Tonnerre!) and Chusan (Fortune, n. 110!).

I adopt Bentham's view of placing this and the subsequent species, formerly referred by him to the genus *Diplopappus*, in the section *Orthomeris*, Torr. et Gray, of *Aster*. The double pappus is indeed of no diagnostic value, if the exterior one is not complete and distinguishable at the first sight. Two, three, or a few more short outer bristles are supposed to be of an occasional occurrence, and may they therefore not be considered as an essential generic character, one constant throughout? To this section also belongs *Aster acuminatus*, Michx., as noticed by Asa Gray in the 'Flora of North America,' vol. ii. pp. 156 and 157. It has quite the habit of the Hongkong plant, and must be removed from *Diplostephium*, Cass., where it is placed by De Candolle, having the pappus neither clavellate at the apex, nor in a double series. In the specimens before me but few of all the achænia examined had a trace of outer pappus, and only sometimes I detected a few short bristles. The achænia are ovate, broad, flat, marginated, and covered with appressed hair, but scarcely sericeous-villous, as is said to be the case in Hinds' specimens, which I have not seen. The pappus is rufous, as in *Diplopappus asperrimus*, DC. The leaves are very variable in their size and shape, as well as in their indument; in some specimens they are very scabrous on both sides, in others very scabrous above, but somewhat soft pubescent beneath, or at least but slightly scabrous. Fortune's n. 110, from Chusan (*Amphirhapis Chinensis*, Schultz, Bip.), is a mere variety of this plant, having leaves a little longer (sometimes 3 inches long, including petiole, and 15 lines broad), of thinner texture, and more scattered hair than the ordinary form.

287. Aster (Orthomeris, *Torr. et Gray*) *baccharoides*, Steetz.—*Diplopappus baccharoides*, Benth.

ll. cc.—Wlprs. l. c. n. 9. Abundant on barren hills (Hinds; Champion, teste cl. Benth.; Hance! Seemann!).

288. Asteromæa *Indica*, Blume.—De Cand. Prodr. vol. v. p. 303. n. 1. Hongkong (Hance!).

De Candolle's brief diagnosis agrees throughout well with Dr. Hance's specimens, except in the squamæ of the involucre, which are imbricated, and arranged in three rows, and not, as stated, in two. In the dried state it is impossible to distinguish whether the disc-flowers be yellow or blue. Our plant has somewhat the appearance of *Calimeris integrifolia*, Turcz., but the short pappus is more paleaceous, the paleæ being united at the base, fimbriate at the apex, and not setose. I regret much that the few specimens are without ripe achænia; they seem to become four-costate. The plant approaches also very near to *Hisutsua Cantoniensis*, De Cand. Prodr. vol. vi. p. 44, of which I possess two specimens, collected by Mr. Theodore Siemssen about Canton, but these have the achænia (also unripe) without any pappus, and the habit of *Boltonia*, L'Hérit. It is however a true Asteroideous plant, having a style with lanceolate and acute branches, and belongs not to the *Senecionideæ*, *Chrysanthemeæ*, where placed by De Candolle, but to the *Bellideæ*.

289. Lagenophora *Billardieri*, Cass., De Cand. Prodr. vol. v. p. 307 +.—*Ixauchenus lyratus*, Cass. Hongkong (Champion, teste cl. Benth).

290. Amphirhapis *leiocarpa*, Benth. in Lond. Journ. Bot. vol. i. p. 488, and in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 234. n. 14.—Wlprs. Rep. Bot. Syst. vol. ii. p. 590.—*Solidago*, C. H. Schultz, Bip., Pl. Fortunei exsicc. n. 106, cf. Flora, 1852, p. 48. Abundant in ravines (Hinds; Champion, teste cl. Benth.; Seemann!). About Chusan (Fortune!).

I am not quite certain whether Seemann's two specimens belong to *Amphirhapis leiocarpa*, Benth., because I have not seen the authentic specimens collected by Hinds and Champion, and because the specimens before me have no ripe achænia, so that I am unable to say whether they be compressed or not, the only distinction between *Amphirhapis* and *Solidago*. They are however quite glabrous and striate, as described by Mr. Bentham, and the whole plant has in fact the habit of some varieties of *Solidago Virgaurea*, L., with a more simple inflorescence, as noticed by the same author; this however always has the achænia pubescent. The short diagnosis agrees well with them, but I find the leaves sparingly and remotely serrate, and not irregularly denticulate. The genus *Solidago* is, as far as I know, not indigenous to China, and the two doubtful species of Loureiro's *Solidago Cantoniensis* and *S. decurrens*, of which the achænia are not described, may probably belong to the genus *Amphirhapis*, De Cand. Fortune's plant is quite the same as Seemann's.

291. Grangea *Maderaspatana*, Poir., De Cand. Prodr. vol. v. p. 373. n. 1. Common in the Happy Valley (Champion, teste cl. Benth.; Hance!).

De Candolle describes the style in the flowers of the disc as undivided, but I always found it bilobed in these and other specimens, the stigmatic branches being broader than the style itself, ovate, flat, somewhat obtuse at the apex, and covered with numerous little blunt papillæ on the outside. The anthers are pure white, truly ecaudate, rounded at the base, and tapering into a lanceolate, somewhat obtuse and incurved, or connivent appendage. The pollen-granules are globose and echinulate. The female flowers are often quadrifid, and not always trifid, as stated by De Candolle, l. c.

292. Conyza *ambigua*, De Cand. Prodr. vol. v. p. 381. n. 31. Common on the roadsides (Champion, teste cl. Benth.; Hance! Seemann!).

293. Blumea *lacera*, De Cand. Prodr. vol. v. p. 436. n. 19 *a*.—Var. *a. Burmanni*, De Cand. cf. Zollinger in Flora, 1847, p. 531. Hongkong (Hance!).

The single specimen is only the upper part of the plant, and has entire leaves, but the lowest leaf shows the sublyrato-pinnatifid form peculiar to the cauline leaves of this species; moreover Zollinger's short diagnosis, l. c., agrees very well with it.

294. Blumea *Javanica*, Zollinger, Flora, 1847, p. 531.—*Blumea lacera*, De Cand.—Var. δ. *Blumei*, De Cand. Prodr. vol. v. p. 436. n. 19 δ. Victoria Peak (Champion, teste cl. Benth.; Hance!).

This is a much more villous plant than the preceding, and has much narrower scales of the involucre, as stated by Zollinger, l. c.; it seems to be a good species.

295. Blumea *hieracifolia*, De Cand. Prodr. vol. v. p. 442. n. 55. Hongkong (Hance!).

The scales of the involucre in our specimens are really villous, and not "glabriusculæ," as said to be by De Candolle. The achænia are appressed, pubescent, almost sericeous; otherwise De Candolle's short diagnosis agrees well. *B. hieracifolia* seems to be closely allied to *B. elongata*, De Cand. Prodr. vol. v. p. 445. n. 75, but that has glabrous achænia. *B. Chinensis*, Wlprs. Nov. Act. Acad. Cæs. Leop. Carol. vol. xix. suppl. 1. p. 294 (not De Cand.) is also said to be allied to *B. hieracifolia*, De Cand., but I have not seen it.

296. Blumea *holosericea*, De Cand. Prodr. vol. v. p. 442. n. 56. Hongkong (Champion, teste cl. Benth.; Hance!).

The few specimens are only the upper part of the plant. The teeth of the leaves are somewhat rigid and pungent, therefore I am rather doubtful whether they belong to *B. holosericea*, De Cand.; otherwise the brief diagnosis agrees well. Vainly I tried to identify our plant with any species of De Candolle's section *Osyodontæ*. None of the descriptions agree with it. It is however almost impossible to determine with certainty the species of such a difficult and by no means satisfactorily defined genus as *Blumea*, De Cand., without examining a great number of authentic specimens.

297. Blumea *crinita*, Arn., De Cand. Prodr. vol. vii. p. 283. Hongkong (Hance! Seemann!).

298. Blumea *Chinensis*, De Cand. Prodr. vol. v. p. 444. n. 70 (non vol. vii. p. 283. n. 96, et Hook. et Arn. Bot. Beech. pp. 195 et 265, et non Wlprs. Nov. Act. Acad. Cæs. Leop. Carol. vol. xix. suppl. 1. p. 294). Tolerably common, trailing in ravines (Champion, teste cl. Benth.; Seemann!).

299. Blumea *alata*, De Cand. Prodr. vol. v. p. 448. n. 90. Hongkong (Seemann!).

The single specimen, in a very young state, precisely agrees with my specimens, collected by Schmidt in the Nilgherry Mountains. It seems to be closely allied to *Blumea vernonioides*, De Cand. Prodr. vol. v. p. 447. n. 87, which I have not seen.

300. Blumea *Wightiana*, De Cand. Prodr. vol. v. p. 435. n. 14. Hongkong (Hance!).

The single specimen is only the foot-long summit of a plant in a young state. The flower-heads are two lines long and broad, crowded on the top of a short peduncle, arranged in short racemes, and gradually passing into a dense, obtuse, and leafless ear, an inch in length, compound of crowded, almost sessile flower-heads. The whole plant is hairy, of a somewhat greyish hue, and herbaceous. The upper leaves are obovate, an inch long, and almost as broad, irregularly and minutely toothed, with somewhat callous tips.

301. Pluchea *Indica*, Less. in Linnæa, 1831, p. 150.—De Cand. Prodr. vol. v. p. 451. n. 7. Hongkong (Hance!).

Many of the flower-heads are swollen to a globular shape, larger than the sound flower-heads, apparently caused by an insect, perhaps belonging to a species of *Cynips*. For in dissecting them I always found all parts of the flower and fruit destroyed, and on the ground some oval cavities, enclosing small bodies, which seem to be the chrysalis of an insect.

302. Duhaldea *Chinensis*, De Cand. Prodr. vol. v. p. 366 (1836).—Hook. et Arn. Bot. Beech. p. 265 (1837).—*Blumea Chinensis*, Hook. et Arn.! l. c. p. 195 (1836), non De Cand. Prodr. l. c.—*Blumea Arnottiana*, Steudl.! Nom. Bot. edit. 2. p. 210 (1841).—*Inula Cappa*, De Cand.! Prodr. vol. v. p. 469. n. 31—*I. oblonga*, De Cand.! l. c.—*I. Pseudo-Cappa*, De Cand.! l. c.—*Vernonia* (Lepidaploa) *congesta*, Benth.! in Lond. Journ Bot. vol. i. p. 487 (1842), et in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 232 (1852).—*Vernonia eriosematoides*, Wlprs.! in Nov. Act. Acad. Cæs. Leop. Carol. vol. xix. suppl. 1. p. 254 (1843).—*Moquinia eriosematoides*, Wlprs.! Rep. Bot. Syst. vol. vi. p. 317 (1846). Very abundant (Hinds, Champion, teste cl. Benth.; Hance! Seemann!).*

This beautiful plant has had the misfortune of having been mistaken by some authors, although De Candolle has already, in 1836, shown it to be the type of a well-defined and good genus. Hooker and Arnott, l. c., simultaneously with De Candolle, took it for a new species of *Blumea*, but soon after recognized it themselves as De Candolle's *Duhaldea Chinensis*. Steudel named it *Blumea Arnottiana*. Bentham took it for a new species of *Vernonia*. Walpers, l. c., also brought it to *Vernonia* as a new species, and a few years after referred it to *Moquinia*. I have examined authentic specimens, ticketed in Walpers' own handwriting, in the Royal Herbarium at Berlin. Finally De Candolle, to make confusion worse confounded, created three new species of *Inula* (*I. Cappa*, *I. Pseudo-Cappa*, and *I. oblonga*) of it.

De Candolle's generic diagnosis of *Duhaldea* is very characteristic and carefully drawn up, but in a single point defective. He states the anthers to be ecaudate, but they are truly caudate, the basilar appendages being long, and often somewhat lacerate at their end. This fact is of a value in De Candolle's classification, because henceforth the genus must be removed from the first subtribe of *Asteroideæ*, the *Asterineæ*, and transferred to the fourth, the *Inuleæ*, where its systematical position will be much more natural. On the other hand, the lanceolate stigmatical branches of the style are somewhat attenuate at their apex, and not so blunt as for the most part in *Inuleæ;* we meet however with the same fact, but reversed, even in a genus (*Eupatorium*). Most of the species of *Eupatorium* have, as is well known, a style with long, cylindraceous, flattened, somewhat obtuse but equal stigmatical branches; in *Eupatorium leucocephalum*, Benth., the branches are much clavellate at the top, or more correctly, truly knot-shaped. When such an exception to the principle is admitted (and surely with good reason) in a genus of great extent, this character (viz. the very end of the stigmatical branches being more or less obtuse) can have no greater value either in a whole tribe, than in a genus containing but a few species. There can therefore be no doubt that the genus *Inulaster*, C. H. Schultz, Bip., must be merged in the older genus *Duhaldea*, De Cand., of which it has quite the habit, and the compound cymes arranged in a terminal short panicle. A careful examination of the two plants gave these results:—Between *Duhaldea Chinensis*, De Cand., and *Inulaster macrophyllus*, C. H. Schultz, Bip., in Rich. Tent. Flor. Abyss. vol. i. p. 399, and in Wlprs. Ann. Bot. Syst. vol. ii. p. 843, there is no other difference in the structure of the flower and fruit than that the stigmatic branches of the latter are somewhat more blunt, and the achænia furrowed and glabrous, with a very small basilar callus, whilst in the former the achænia (not quite ripe) are hairy, and the callus is some-

* Inula *Britannica*, De Cand., Fl. Fr. vol. iv. p. 149.—*Inula Britannica*, Linn. Sp. 1237.—De Cand. Prodr. vol. v. p. 467. n. 22. Shanghai (C. F. Tonnerre!).

I do not know whether this widely-spread European plant has previously been found in China; but the single specimen cannot be distinguished in the slightest from the small-leaved forms of the European plant.

what greater. The style is bulbous at the base in both, and the stigmatic series the same; the anthers, pollen, and filaments are not different; the shape and structure of the corollas, of the hermaphrodite as well as the female flowers, the pappus, the receptacle, the involucre are quite the same in both. The female flowers however, very few in number, trifid or quadrifid at the summit, seem to be abortive hermaphrodite ones, because I found always in both three or four filaments, often with the rudiments of free but sterile anthers. These rudiments I never found in *Inula Conyza*, De Cand., in which the female flowers are more slender, and of a more delicate texture; they seem also to be arranged in a complete series, and in a greater number. Otherwise I would agree with any one who would combine *Inula Conyza*, and some other species of that genus, which have the furrowed achænia of almost the same shape as in *Inulaster macrophyllus*, with *Duhaldea*, De Cand. Provisionally the two species may be characterized thus:—

Duhaldea Chinensis, De Cand. l. c.—D. fruticosa; caule ramisque teretibus dense villoso-tomentosis; foliis inferioribus brevissime petiolatis, superioribus subsessilibus oblongo-lanceolatis, utrinque attenuatis, minute calloso-dentatis vel integerrimis, supra pilis sparsis scabris, subtus villis sericeis dense cano-tomentosis; styli ramis apice paullisper attenuatis; achæniis hirsutis.

Duhaldea macrophylla, Steetz.—*Inulaster macrophyllus*, C. H. Schultz, Bip. l. c.—D. biennis (?); caule herbaceo, glabriusculo, sulcato, ramis pubescentibus; foliis omnibus sessilibus, inferioribus vaginantibus, superioribus basi late cordata semiamplexicaulibus ovato-oblongis, irregulariter calloso-denticulatis vel subintegerrimis, supra pilis sparsis scabris, subtus molliter tomentosis; styli ramis apice clavato-obtusis; achæniis glabris sulcatis.

303. Anisopappus *Chinensis*, Hook. et Arn. Bot. Beech. p. 196.—De Cand. Prodr. vol. vii. p. 253. Victoria Peak (Hance!).

De Candolle has not seen this interesting plant, otherwise he would not have placed it amongst his "Plantæ incertæ sedis." Hooker remarks, with good reason, that "it approaches in character to *Buphthalmum*, but has the habit of *Verbesina*." It must be ranged in the subtribe of *Buphthalmeæ*, because it has the style of the *Asteroideæ* tribe, which is almost quite the same as in *Pallenis*, bulbous at the base, and shortly bilobed at the top, the stigmatic lobes being ovate. The teeth of the disc-corolla are exceedingly small; the young achænia are quadrangular and somewhat hairy; the chaff of the receptacle plicate, clasping the achænia and the whole disc-flower. Probably this plant is the *Verbesina Chinensis* of Linnæus, as noticed already by Hooker and Arnott and by De Candolle, l. c., whose diagnosis and short but characteristic description agrees very well with our plant. But Linnæus, in Sp. Pl. ed. Richter, p. 850, states, "Semina coronata margine et setis 4 *lævibus*." The four very short bristles of the achænia, being merely serrate, should therefore prove that our plant cannot be identified with Linnæus's *Verbesina Chinensis*, who certainly has not overlooked the teeth of the bristles! I suppose the misprints in Linnæus's time were as numerous as in ours, and it may be conjectured that in his manuscript was written "setis 4 *brevibus*," and that the printer made "setis 4 *lævibus*" of it. It would be worth the while to examine the plant in the herbarium of Linnæus.

304. Eclipta *prostrata*, Linn., De Cand. Prodr. vol. v. p. 490. n. 4. Hongkong (Seemann!).

Small procumbent specimens, not higher than 8–10 inches; the leaves 1 inch long, 3–4 lines broad, elliptical, attenuated into a short petiole; the immaturea chænia crowned with two opposite, short, callous teeth, in a small coroniform pappus.

305. Siegesbeckia *orientalis*, Linn., De Cand. Prodr. vol. v. p. 495. In waste places (Hinds, Champion, teste cl. Benth.; Hance!).

Tribus IV. Senecionideæ.

306. Xanthium *discolor*, Wallroth, Beiträge zur Botanik, vol. i. part 2. p. 232.—Wlprs. Rep. Bot. Syst. vol. vi. p. 151. n. 6.—*X. Indicum*, Wall. Cat. 3181.—De Cand. Prodr. vol. v. p. 523. n. 2 (ex parte).—*X. orientale*, Linn.—*X. Chinense*, Mill. Dict.—*X. orientale*, Thunb. Fl. Jap. p. 267. In waste places (Hance!).

The few specimens being in a somewhat defective condition, but having good preserved fruits, agree well with Wallroth's diagnosis, l. c., who abolished the old name *Xanthium Indicum*, of various authors, and divided it into three new species, *X. discolor*, *Roxburghii*, and *brevirostre*, Wallr.

307. Wedelia *calendulacea*, Less. Synops. Gen. Comp. p. 222 (non Rich.).—De Cand. Prodr. vol. v. p. 539. n. 9. Hongkong (Hance!); also gathered near Canton (Siemssen!).

This pretty little plant seems to have a wide geographical range in India. The leaves are mostly entire, or with one to three deep serratures on each side.

308. Wollastonia *scabriuscula*, De Cand. Prodr. vol. v. p. 547. n. 3. About rocks and hedges close to the sea (Hance!).

309. Bidens *Chinensis*, Willd. Sp. Pl. vol. iii. p. 1719, et plurimorum auctorum recentium (non Willd. Herb. n. 15,023). Very common (Champion, teste cl. Benth.; Hance!); also gathered near Canton (Siemssen!).

The *Bidens Chinensis*, Willd., and of most of the modern authors, is a very good species, but not well recognized by many of them. Sprengel (Syst. Veg. vol. iii. p. 453. n. 24) placed it with *B. leucantha*, Willd., and De Candolle (Prodr. vol. v. p. 598) is doubtful whether the true *B. Chinensis*, Willd., belongs to *B. leucantha*, Willd., to *B. Sundaica*, Blume, or to *B. Wallichii*, De Cand. It belongs to none of these; and it seems, indeed, that De Candolle has not at all known the plant. I cannot clear up the whole matter, because my specimens from Hongkong and Canton (belonging to the same species) are not in the best condition, having good achænia, but imperfect flowering capitula; but at least I hope to be able to contribute something towards solving the problem. I have examined the authentic specimens in the herbarium of Willdenow under n. 15,023; these however gave no better results than the examination of the authentic specimens of *B. leucantha*, Willd., under n. 15,022 in the same herbarium, as I have noticed on page 158 of this work. There are four sheets with specimens of *Bidens*, of which nos. 1, 2, and 3 contain apparently cultivated specimens of *B. leucantha*, Willd., in a very young and defective state, and n. 4 two specimens, somewhat imperfect, but bearing one good flower-head in fruit, gathered by Klein in Ceylon. These belong, without doubt, to *Bidens Wallichii*, De Cand. Prodr. vol. v. p. 598. n. 28, for that has the inner scales of the involucre alone marginated, the outer ones herbaceous and very pubescent, and the long achænia (6–7 lines in length) crowned with three connivent aristæ, whilst *B. Sundaica*, Blume, l. c., n. 27, is said to have the scales of both series marginated, and shorter achænia (4–5 lines in length); therefore this species, being in Willdenow's own herbarium under the name of *B. Chinensis*, should bear henceforth that name. But, as far as I know, the latter species is never found in China, and so it seems to be advisable to retain the name of *Chinensis* for a plant considered, although not described, by most of the modern botanists as the true *Bidens Chinensis*, Willd., and found in several parts of China, including Hongkong. This species is easily distinguished by its shining smoothness, by its leaves being mostly ternatisect, by its very broad ovate leaflets, somewhat unequal at their base, paler on their under side, with a very sharp but short acuminate apex, and very sharp-pointed serratures, by its very small flower-heads, 3–4 lines long, bearing somewhat short ligulæ, and a double series of involucral scales, of which the inner ones are broad, oblong,

and marginated, the outer herbaceous, somewhat puberulous, much narrower and rather shorter, and by its blackish and smooth, shagreen-like, cylindrical achænia, 4–4½ lines in length, covered towards the apex with some scattered, rigid cilia, of which many, being somewhat triangular, are crowned with three short (1 line long), almost concolorous aristæ, whilst other achænia are somewhat compressed, and crowned with two opposite aristæ.

310. Bidens *bipinnata*, Linn., De Cand. Prodr. vol. v. p. 603. n. 65+. Hongkong (Champion, teste cl. Benth.)

311. Cosmos *caudatus*, H.B.K. Nov. Gen. vol. iv. p. 240.—De Cand. Prodr. vol. v. p. 606. n. 4. Hongkong. Scarcely indigenous, but probably naturalized (Hance!).

312. Glossogyne *tenuifolia*, Cass. et Less.—De Cand. Prodr. vol. v. p. 632. n. 2.—*Bidens tenuifolia*, Lab. Sert. Caledon. p. 44. t. 45! Hongkong (Hance!).

The achænia of this genus have the appearance of those of *Bidens*, but the ligulæ are true female flowers, bearing a bifid style, and not sterile ones, as in *Bidens*. The aristæ of the achænia are straight, not much divaricate, as stated to be the case in *G. pinnatifida*, De Cand., and the segments of the leaves true linear. Moreover the whole plant exactly agrees with the instructive and characteristic figure of Labillardière's Sert. Caledon. l. c.

313. Pyrethrum *Indicum*, Cass. (?) Dict. 44. p. 149. non Roxb.—De Cand. Prodr. vol. vi. p. 62. n. 49. Hongkong (Hance!).

The single specimen is in too bad a condition to be determined with certainty.

314. Pyrethrum *Sinense*, Sabin. Trans. Hort. Soc. vol. iv. p. 330. t. 14.—De Cand. Prodr. vol. vi. p. 62. n. 50. Victoria Peak and elsewhere (Champion, teste cl. Benth.; Hance! Seemann!).

Truly indigenous. The specimens agree well with mine from Japan, received from my lamented friend Zuccarini.

315. Pleiogyne *cardiospermum*, Edgw. in Trans. Linn. Soc. Lond. vol. xx. p. 71+. In rice-fields, abundant (Champion!).

316. Artemisia *Japonica*, Thunb., De Cand. Prodr. vol. vi. p. 100. n. 41+.—*A. glabrata*, Wall. Saiwan and some other places, but not common (Champion, teste cl. Benth.).*

* Artemisia *lavandulæfolia*, De Cand. Prodr. vol. vi. p. 110. n. 94. Shanghai (C. F. Tonnerre!).

I am somewhat doubtful whether our plant really belongs to *A. lavandulæfolia*, De Cand., as I have not seen authentic specimens of it. The upper entire leaves are elliptical, 6–10 lines long, 1–1½ lines broad, attenuate at both ends, very acute, with a somewhat callous tip, and not linear, as stated by De Candolle. The lower leaves (unknown to De Candolle) are pinnatifid, with two or three pairs, or trifid, the leaflets decurrent along the midrib; otherwise of the same size and shape. Most of the leaves, the lower divided ones, as well as the upper entire, are stipellate-auriculate at their base,with two small stipellæ on each side, which is not mentioned in De Candolle's short diagnosis; otherwise it fully agrees. I should therefore suppose that it could belong to *A. leptostachya*, De Cand. Prodr. l. c. p. 113. n. 107 (also unknown to me), because this character is noticed in its diagnosis; but in that species the leaves are said to be all pinnatiparted or trifid, and to be "subtus incana," whilst in our plant they are densely tomentose, perhaps more so than in *A. vulgaris*, Linn., of which it has the entire habit, but differing at first sight by its shorter and less divided leaves, and its somewhat smaller flower-heads, having the outer involucral scales much more

317. Artemisia *vulgaris*, Linn., De Cand. Prod. vol. vi. p. 112. n. 106. Hongkong (Hance!).

Not noticed by De Candolle as occurring in China, but by Loureiro in his 'Flora Cochinchinensis,' p. 600, as spontaneous and cultivated there. It quite agrees with our European form.

318. Artemisia *annua*, Linn., De Cand. Prodr. vol. vi. p. 119. n. 148. Hongkong (Hance!).

This species is noticed by Loureiro, l. c. p. 599, as growing about Peking. Hance also noticed it as spontaneous in China, but De Candolle does not. I cannot see the slightest difference between Hance's Chinese specimens and those of my own herbarium, gathered about Karabagh and in Siberia.

319. Gnaphalium *multiceps*, Wall., De Cand. Prodr. vol. vi. p. 222. n. 4.—*G. confertum*, Bth. in Lond. Journ. Bot. vol. i. p. 488, and in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 235. n. 27. Common in ricefields (Hinds, Champion, teste cl. Benth.; Hance!).

Mr. Bentham himself, that accurate and conscientious observer, reduced his own *G. confertum* in Hook. Journ. Bot. l. c., and apparently with good reason, to this species. Hance's specimens agree well with those from Nepal and Silhet, compared in the Royal Herbarium of Berlin.

320. Gnaphalium *purpureum*, Linn., De Cand. Prodr. vol. vi. p. 232. n. 65.—Var. *spathulatum*, Lour. (non Thunb. nec Burm.).—*G. Americanum*, Willd. (non Miller nec Swartz).—*G. Pennsylvanicum*, Willd., De Cand. Prodr. vol. vi. p. 235. n. 80.—Annuum; foliis omnibus obovato-lanceolatis basi in petiolum brevem sensim attenuatis, supra araneosis subtus cum caule floccoso-tomentosis, involucri squamis scariosis nitidis rufescentibus medio virescentibus acutis. Hongkong (Hance!).

This variety, having a somewhat peculiar habit, is not confined to America alone, but also found in Hongkong and Mauritius, whence I have seen an authentic specimen in the Royal Herbarium of Berlin, gathered by Commerson, communicated by Dr. Thouin, and named *Gnaphalium spathulatum*, Lamarck, Encyclop., evidently by an old botanist. This specimen throughout agrees with ours from Hongkong, and with numerous garden specimens, examined by me, in several herbaria, bearing the names of *G. coarctatum*, Willd., *G. Americanum*, Willd., *G. spicatum*, Lour., *G. Pennsylvanicum*, Willd., *G. obtusifolium*, Hort., and even *G. imbricatum*, Linn., a true *Helichrysum*. Indeed there is very great confusion, and the whole subdivision of "*spicate Gnaphalia*," is so ill defined (as well remarked by Asa Gray in the 'Flora of North America') that it greatly needs a new and more accurate revision.

We are better enabled to distinguish our variety from the common North American *G. purpureum*, Linn., by its peculiar habit, preserved indeed by cultivation, than by any of its technical characters. The floccose pubescence is more loose than in *G. purpureum*, the leaves in general are broader (sometimes 8–12 lines towards the apex), the floral leaves more uniform with the cauline ones, and the involucral scales somewhat narrower, and never tinged with red, but either quite rufescent, or tinged with shining green in their middle. Our variety certainly is always annual, and if the North American *G. purpureum* should be perennial, as stated by Mühlenberg, Elliot, Darlington, and others, but doubted by Asa Gray, perhaps it might

tomentose. Seemann's specimens, gathered in Hongkong, are in too young a state to be referred with certainty to the same species; they have however the habit of it.

Artemisia *apiacea*, Hance!—Wlprs. Ann. Bot. Syst. vol. ii. p. 895. n. 1. Shanghai (C. F. Tonnerre!).

This beautiful species belongs apparently to De Candolle's fourth section of the genus, viz. *Absinthium*, and not, as remarked by Hance, to the first, *Dracunculus*, the disc-flowers being truly hermaphrodite, and the very pyramidal elevated receptacle covered with very short hair. It has entirely the habit of the species of this section.

prove a good species, different from *G. purpureum*, Linn., so much the more as it seems that the latter has the inner hermaphrodite flowers in a greater number than our supposed variety.—By better essential characters our plant is distinguished from *G. Indicum*, Linn. (De Cand. Prodr. vol. vi. p. 231. n. 62, and from *G. Niliacum*, Raddi (De Cand. l. c. n. 61, closely allied to it, and perhaps not different), both of which it at first sight resembles; but they differ by their more slender habit and smaller size, by having narrower leaves, attenuated in a longer petiole, whose enlarged base is somewhat auriculate-clasping, by smaller capitula and flowers, by the scales of the involucre being quite rufescent, and not tinged with green, and particularly by its very deciduous pappus, whose bristles are falling off always isolated, whilst in *G. purpureum*, L., and our variety, the bristles of the pappus, also deciduous, are, when falling off, always united at their very base by a small ring, and thus cohering together.

321. Gynura *Pseudo-china*, De Cand. Prodr. vol. vi. p. 299. n. 7.—Var. *pubescens*, Benth. +. Victoria Peak and elsewhere (Hinds, Champion, teste cl. Benth.).

322. Gynura *auriculata*, De Cand. Prodr. vol. vi. p. 300. n. 15.
Var. *a. glabrata*, De Cand. l. c. Victoria Peak and elsewhere (Hance!).
Var. *β. puberula*, De Cand. l. c. Victoria Peak and elsewhere (Hance!).

Hooker and Arnott's *Gynura bulbosa*, in Bot. Beech. p. 194, De Cand. Prodr. l. c. n. 19, and *Gynura ovalis*, De Cand. Prodr. l. c. n. 11, both not seen by De Candolle, seem to be the same species, for in all collections from Canton or Hongkong compared I have met with it, and never found any other. Philippi gathered it in China (no exact locality recorded), my friend Siemssen near Canton. It is easily distinguished by its upper leaves clasping the stem at the base of their petiole by means of a large auricle, and by the pretty reticulation (caused by dark purple lines) mentioned by De Candolle, l. c. They are not so conspicuous in the puberulous form as in the glabrous one, but when "the pubescence wears off," as well remarked by Hooker and Arnott, l. c. "the under side is elegantly marked with numerous slender waved purplish veins." I have not seen an authentic specimen of this plant from Mauritius, and therefore I am unable to say whether it be different from the Chinese one. The short diagnosis of De Candolle, l. c., however agrees well with it.

323. Emilia *sonchifolia*, De Cand. Prodr. vol. vi. p. 302. n. 1. In waste places (Hinds, teste cl. Benth.; Hance! Seemann!).

324. Ligularia *Kæmpferi*, Sieb. et Zucc. Flor. Japon. vol. i. p. 77. t. 35.—Wlprs. Rep. Bot. Syst. vol. ii. p. 651. n. 1.—*Senecio Kæmpferi*, De Cand. Prodr. vol. vi. p. 363. n. 118, et vol. vii. p. 301. Hongkong (Hance!).

Zuccarini's instructive figure agrees well with our beautiful plant, in no respect different from the Japanese one.

325. Senecio *campylodes*, De Cand. Prodr. vol. vi. p. 370. n. 160.—*S. Chinensis*, De Cand. vol. vi. p. 363. n. 116??—*S. Hindsii*, Benth. in Lond. Journ. Bot. vol. i. p. 488, et in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 235. n. 29!—Wlprs. Rep. Bot. Syst. vol. ii. p. 654. n. 10. Ravines of Victoria Peak (Hinds, Champion, teste cl. Benth.; Hance!).

326. Senecio *Stauntonii*, De Cand. Prodr. vol. vi. p. 370. n. 117. Hongkong (Champion, teste cl. Seem.; Hance!).

Tribus V. Cynareæ.*

327. Saussurea *linearis*, Champ.—Benth. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 235. n. 30. Victoria Peak (Champion, teste cl. Benth.; Hance!).

The few specimens agree well with Bentham's precise diagnosis, l. c. The ripe achænia are glabrous, somewhat curved and ribbed. There is also a specimen gathered by C. F. Tonnerre at Shanghai, and closely allied to it, but it seems to differ in its more slender peduncles and smaller flower-heads. The involucral scales are narrower, and less scarious at the summit. The single specimen however is in too bad a condition to serve any purpose.

328. Cirsium *Chinense*, Gardn. et Champ. in Hook. Journ. and Kew Misc. vol. i. p. 323, et Benth. ibidem, vol. iv. p. 236. n. 31+. Victoria Peak and other hills (Champion, teste cl. Benth.).

329. Cirsium *oreithales*, Hance, Wlprs. Ann. Bot. Syst. vol. ii. p. 944. n. 6. Victoria Peak and hills (Hance! Seemann!).

I refer our specimens to this species, and not to *Cirsium Chinense*, Gardn. et Champ. in Hook. Journ. Bot. and Kew Misc. vol. i. p. 323, because I am not quite persuaded that both belong to the same species. They agree well with Hance's diagnosis in Walpers, l. c., but not with that of *Cirsium Chinense*. Our specimens have not the two foliaceous bracts under the flower-head, as recorded by Gardner and Champion, nor are their leaves glabrous on both sides; they are so on the upper, but araneoso-tomentose on the under side, as described by Hance.

Tribus VI. Mutisiaceæ.

330. Ainsliæa *fragrans*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 236. n. 32. Scarce on Victoria Peak (Champion, teste cl. Benth.).

331. Gerbera *ovalifolia*, De Cand. Prodr. vol. vii. p. 17. n. 8.—Benth. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 236. n. 33.—*Gerbera amabilis*, Hance in Wlprs. Ann. Bot. Syst. vol. ii. p. 947. n. 3 (teste cl. Benth. l. c.). On hills; Victoria Peak, Mount Parker, etc. (Champion, teste cl. Benth.; Hance!).

Hance's authentic specimens have the involucral scales herbaceous and pubescent throughout, as is the case in the East Indian plant.

Tribus VII. Cichoraceæ.

332. Lactuca *brevirostris*, Champ.—Benth. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 237. n. 34. Hongkong (Champion, teste cl. Benth.; Hance!).

* Haplotaxis *carthamoides*, Hamilt. Herb.—De Cand. Prodr. vol. vi. p. 540. n. 14. Shanghai (C. F. Tonnerre!).

The single specimen agrees well in all respects with two specimens sent by Wallich from Silhet and Martabania, under n. 2896, which I compared in the Royal Herbarium at Berlin. I cannot find the slightest difference in any part. De Candolle states in his diagnosis the upper side of the leaves being somewhat rough (*scabrida*), but in the East Indian species, as well as in the Chinese, they are really soft, but in the dried state, as it has the appearance, sprinkled with dots.—*Haplotaxis* is more correct than *Aplotaxis*, the Greek word ἁπλόος, from which De Candolle derived his name, having a *spiritus asper simplex*, and not a *spiritus lenis*.

Some specimens of this species agree well with Bentham's diagnosis; others mixed up with them, and apparently closely allied, seem however to be different. They have somewhat larger capitula, shorter and more rigid peduncles, and the leaves not auricled; the beak of the achænia seems also to be somewhat longer, but they are in a young state. I cannot decide whether these specimens belong to *L. longifolia*, De Cand. Prodr. vol. vii. p. 135. n. 18, said by Bentham to be nearly allied, as that species is unknown to me.

333. Taraxacum *Dens-Leonis*, Desf., De Cand. Prodr. vol. vii. p. 145. n. 2+. Found amongst the ruins of an old house (Champion, teste cl. Benth.).

334. Barkhausia *tenella*, Benth. in Lond. Journ. Bot. vol. i. p. 488+. Hongkong (Hinds, teste cl. Benth.).

There are two specimens, the upper branches of a Cichoraceous plant, which may prove to be this species, but the achænia are too young to admit of critical examination.

335. Brachyramphus *ramosissimus*, Benth. in Hook. Lond. Journ. Bot. vol. i. p. 489, et in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 237.—Wlprs. Rep. Bot. Syst. vol. ii. p. 693.—*Dubyæa ramosissima*, Hance in Wlrps. Ann. Bot. Syst. vol. ii. p. 1028. Hongkong (Hinds, teste cl. Benth.; Hance! Seemann!).

Mr. Bentham is somewhat in doubt whether this plant really belongs to *Brachyramphus*, De Cand., and apparently with good reason, considering that most of the genera of *Lactuceæ* are not strictly enough circumscribed, and pass one into the other. Moreover I fully agree with him that our plant has not the slightest relation to the genus *Dubyæa*, to which it is referred by Hance.

336. Sonchus *oleraceus*, Linn., De Cand. Prodr. vol. vii. p. 185. n. 6+. In waste places (Hinds, teste cl. Benth.).

337. Youngia *runcinata*, De Cand. Prodr. vol. vii. p. 192. n. 3.—*Youngia*, sp., allied to *Y. napifolia*, De Cand., cf. Benth. in Hook. Journ. Bot. and Kew Misc. vol. iv. p. 237. n. 36. Hongkong (Champion, teste cl. Benth.; Hance!).

This plant may be the same species collected by Meyen in China, and described by Walpers in the Nov. Act. Acad. Cæs. Leop. Carol. vol. xix. suppl. 1, as *Youngia runcinata*, and also the same gathered by Champion in Hongkong, supposed by Mr. Bentham to be a mere variety of *Y. napifolia*, De Cand. Both species have indeed many characters in common, but in our specimens the lobes of the leaves are almost triangular and acute, as in *Y. runcinata*, and not oblong and obtuse sinuate, as in *Y. napifolia*. The achænia however, almost ripe in our specimens, are light brown, strongly ribbed, and much attenuated at their apex.

Zinnia elegans, Jacq., *Coreopsis tinctoria*, Nutt., *Tagetes erecta*, Linn., and *Gaillardia pulchella*, Foug., are cultivated in the gardens.

STYLIDIEÆ.

338. Stylidium *uliginosum*, Swartz.—De Cand. Prodr. vol. vii. p. 336.—*S. Sinicum*, Hance in Wlprs. Ann. vol. ii. p. 1030! Moist situations (Champion! Hance!).

LOBELIACEÆ.

339. Piddingtonia *nummularia*, A. De Cand. Prodr. vol. vii. p. 341. Common in ricefields (Champion!).

340. Lobelia *trigona*, Roxb.—*L. trigona* et *trialata*, A. De Cand. Prodr. vol. vii. pp. 359 et 360. Rather scarce (Champion !).

CAMPANULACEÆ.

341. Platycodon *grandiflorum*, A. De Cand.—Var. *Chinense*, Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 296.—*P. Chinense*, Lindl. et Paxton, Fl. Gard. vol. ii. t. 61 ! On the Cuckchew side of the Island only (Champion ! Hance !).

342. Wahlenbergia *agrestis*, A. De Cand. Monog. Camp. p. 145. Ricefields (Champion !).

GOODENIACEÆ.

343. Scævola *Lobelia*, Linn.—Var. *sericea*, Benth.—*S. sericea*, Forst., De Cand. Prodr. vol. vii. p. 506.—*S. lætevaga*, Hance in Wlprs. Ann. vol. ii. p. 1055 ! Rocks on the sea-shore, growing gregariously in large masses (Champion ! Hance !).

SIPHONANDRACEÆ.

344. Vaccinium *Chinense*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 297. Happy Valley (Champion ! Hance ! Seemann !).

345. Enkyanthus *quinqueflorus*, Lour., var. *brevicalyx*, Benth.—*E. reticulatus*, Lindl., De Cand. Prodr. vol. vii. p. 733. Abundant on the hills (Champion ! Hance ! Seemann !).

Enkyanthus uniflorus, Benth., having been founded on some imperfect flowers of *E. quinqueflorus*, mixed with specimens of *Azalea squamata*, must be suppressed.

RHODORACEÆ.

346. Azalea *Indica*, Linn.—*Rhododendron Indicum*, Sweet, De Cand. Prodr. vol. vii. p. 726. Abundant on the banks of streams (Champion ! Hance !).

347. Azalea *squamata*, Lindl. Journ. Hort. Soc. vol. i. p. 152.—Bot. Reg. 1847. t. 3. Abundant on the hills (Champion ! Hance !).

348. Azalea *myrtifolia*, Champ. in Bot. Mag. t. 4609. On the Black Mountain, on rocks, with *A. squamata* and *Indica* (Champion ! Eyre !).

349. Azalea *ramentacea*, Lindl. Journ. Hort. Soc. vol. iv. p. 291. Hongkong, according to Lindley, but not gathered by either Champion, Hance, or Seemann.

350. Rhododendron *Championæ*, Hook. Bot. Mag. t. 4609. Ravines of Mount Victoria (Champion !).

Several species of *Azalea* are cultivated in the gardens.

PRIMULACEÆ.

351. Lysimachia *alpestris*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 299. Always on the banks of streams (Champion ! Eyre, Icon. ined. ! teste cl. Benth.).

MYRSINEÆ.

352. Mæsa *Sinensis*, A. De Cand. Prodr. vol. viii. p. 82.—Var. *glabrior*, Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 300. Very common (Champion! Hance!).

353. Mæsa *coriacea*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 300. Equally common with the *M. Sinensis* (Champion! Hance!).

354. Embelia *Ribes*, Burm.—A. De Cand. vol. viii. p. 85. Common in ravines of Mount Victoria and the Happy Valley woods (Champion! Hance!).

355. Samara *obovata*, Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 301.—*Chloripetalum obovatum*, Benth. in Lond. Journ. Bot. vol. i. p. 490.—*C. Benthianum*, Hance in Wlprs. Ann. Bot. vol. iii. p. 10. Common at West Point and Victoria Peak, Happy Valley (Champion! Hance! Seemann!); also collected by Fortune, n. 171.

356. Myrsine *capitellata*, Wall.—A. De Cand. Prodr. vol. viii. p. 94.—Var. *angustifolia*, Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 301. Hongkong (Champion! Hance!).

357. Ardisia *pauciflora*, Heyne.—A. De Cand. Prodr. vol. viii. p. 127. In ravines (Champion! Hance!).

358. Ardisia *crispa*, A. De Cand. Prodr. vol. viii. p. 134.—*A. crenulata*, Lodd. Victoria Peak, and near the Buddhist Temple (Champion! Hance!).

359. Ardisia *punctata*, Lindl.—A. De Cand. Prodr. vol. viii. p. 135. Abundant on Victoria Peak (Champion).

I do not hold this to be specifically distinct from *A. crispa*, A. De Cand.

360. Ardisia *Japonica*, Blume.—A. De Cand. Prodr. vol. viii. p. 135. In a ravine of Mount Victoria (Champion!).

361. Ardisia *primulæfolia*, Gardn. et Champ. in Hook. Journ. and Kew Misc. vol. i. p. 324. In grassy places in ravines; Mount Victoria, Black Mountain, Mounts Parker and Gough (Champion!).

ÆGICERACEÆ.

362. Ægiceras *majus*, Gærtn.—De Cand. Prodr. vol. viii. p. 142.—*A. fragrans*, Kœn. Salt-water marshes (Hance! Champion!).

SAPOTACEÆ.

363. Sideroxylon *Wightianum*, Hook. et Arn. Bot. Beech. p. 196. t. 41. Happy Valley woods and Mount Victoria (Champion! Hance! Seemann!).

EBENACEÆ.

364. Rospidios *vaccinoides*, A. De Cand. Prodr. vol. viii. p. 220. Very abundant all over the Island (Champion! Hance! Seemann!).

365. Diospyros *Morrisiana*, Hance in Wlprs. Ann. vol. iii. p. 14. Mounts Victoria, Gough, and Parker (Hance! Champion!).

366. Diospyros *eriantha*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 302. Happy Valley woods (Champion!).

STYRACEÆ.

367. Symplocos *Japonica*, A. De Cand. Prodr. vol. viii. p. 255.—Var.? *crassifolia*, Benth. in Hook. Journ. and Kew Misc. vol. iv. p. 303. Mount Victoria (Champion!).

368. Symplocos (Hopea) *microcarpa*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 303. Happy Valley woods (Champion!).

369. Styrax *suberifolium*, Hook. et Arn. Bot. Beech. p. 196. t. 40. Rather common (Champion! Hance!).

370. Styrax *odoratissimum*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 304. Ravines of Mount Victoria (Champion!).

OLEACEÆ.

371. Fraxinus (Ornus) *retusa*, Champ. in Hook. Journ. and Kew Misc. vol. v. p. 330. Woods of the Happy Valley (Champion! Hance!).

372. Olea *marginata*, Champ. in Hook. Journ. and Kew Misc. vol. v. p. 330. Happy Valley, near the waterfall (Champion! Hance!).

373. Osmanthus *fragrans*, Lour.—De Cand. Prodr. vol. viii. p. 291. Extensively cultivated in Chinese gardens.

"Some time ago," says Dr. Hance, in a letter from Hongkong (Bonplandia, vol. ii. p. 120), "I found a specimen of *Osmanthus fragrans* in fruit. Unfortunately it was not ripe, and I did not afterwards examine it; but I fancy the genus ought, with Endlicher, to be merged in *Phillyrea*, not *Olea*, as by most botanists. A. De Candolle retains *Osmanthus* as a distinct genus. Neither Loureiro nor Kämpfer had ever seen this fruit, and the latter even states it to be unknown in Japan."

374. Ligustrum *Sinense*, Lour.—Benth. in Hook. Journ. and Kew Misc. vol. v. 331.—*Olea Walpersiana*, Hance, et *O. consanguinea*, Hance in Wlprs. Ann. vol. iii. pp. 17, 18! Cultivated, but found also frequently on roadsides (Champion! Hance!).

JASMINEÆ.

375. Jasminium *paniculatum*, Roxb.—De Cand. Prodr. vol. xiii. p. 310. Common on Victoria Peak and other ravines (Champion! Hance!).

Dr. Hance's collection contains, from the gardens, *Jasminum Sambac*, Ait., *J. fruticans*, Linn., and *Forsythia odoratissima*, Lindl.

APOCYNEÆ.

376. Melodinus *fusiformis*, Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 332. Buddhist Temple, near East Point (Champion!).

377. Melodinus *lætus,* Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 332. Hongkong (Champion !).

378. Melodinus *suaveolens,* Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 333.—*Lycima suaveolens,* Hance in Wlprs. Ann. vol. iii. p. 31 ! Hongkong (Champion ! Hance !).

379. Alyxia *Sinensis,* Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 334. On rocky hills and in woods, common (Champion !).

380. Cerbera *Odollam,* Gærtn.—De Cand. Prodr. vol. viii. p. 353. Chiefly towards the sea-shore (Champion ! Hance !).

381. Vinca *rosea,* Linn., De Cand. Prodr. vol. viii. p. 382. Apparently wild, but probably only naturalized (Champion ! Hance !).

382. Strophanthus *divergens,* Grah.—De Cand. Prodr. vol. viii. p. 417.—Hance in Hook. Journ. vol. vii. p. 472. Abundant in spots near the level of the sea (Champion ! Hance !).

383. Rhynchospermum *jasminoides,* Lindl. in Journ. Hort. Soc. vol. i. p. 74, et in Paxton, Fl. Gard. vol. ii. p. 26. f. 147.—Var. minor, *glaberrima,* Benth. Abundant on the top of Mount Gough (Champion !).

384. Aganosma? *lævis,* Champ. in Hook. Journ. and Kew Misc. vol. iv. p. 335. In a ravine (Champion ! Hance !).

385. Ecdysanthera *rosea,* Hook. et Arn. Bot. Beech. p. 198. t. 42. Ravines at West Point; in the Happy Valley (Champion ! Hance !).

386. Pottsia *Cantoniensis,* Hook. et Arn. Bot. Beech. p. 199. t. 43. Hongkong (Champion ! Hance !).

Allamanda catharctica, L., and *Nerium odorum,* Ait., are cultivated in the gardens.

ASCLEPIADEÆ.

387. Toxocarpus *Wightianus,* Hook. et Arn. Bot. Beech. p. 200. Hedges near West Point (Hance ! Champion !).

388. Holostemma *pictum,* Champ. in Hook. Journ. and Kew Misc. vol. v. p. 53. Ravines of Mount Victoria (Champion ! Hance !).

389. Asclepias *Curassavica,* Linn., De Cand. Prodr. vol. viii. p. 566. Naturalized all over the Island (Champion ! Hance ! Seemann !).

390. Tylophora *hispida,* Dene. in De Cand. Prodr. vol. viii. p. 610. Common about Victoria (Champion ! Hance !).

391. Marsdenia *tinctoria,* R. Brown.—De Cand. Prodr. vol. viii. p. 613. Ravines of Mount Victoria (Champion !).

392. Stephanotis *Chinensis,* Champ. in Hook. Journ. Bot. and Kew Misc. vol. v. p. 53. Happy Valley, very scarce (Champion !).

393. Gymnema *sylvestris*, R. Brown.—De Cand. Prodr. vol. viii. p. 621.—Var. *Chinensis*, Benth. in Hook. Journ. l. c. p. 54. Near the Magazine Guard (Champion! Hance!).

394. Pentasacme *Championi*, Benth. in Hook. Journ. and Kew Misc. vol. v. p. 54. In waterfalls, among the spray (Champion! Hance!).

395. Dischidia *Chinensis*, Champ. in Hook. Journ. and Kew Misc. vol. v. p. 55. In ravines, on rocks; Mount Victoria (Champion!).

396. Hoya *carnosa*, R. Brown, De Cand. Prodr. vol. viii. p. 636. Abundant in ravines, on rocks, especially those of Mount Victoria (Champion!).

GENTIANEÆ.

397. Exacum *bellum*, Hance in Hook. Journ. of Bot. vol. vii. p. 472, et in Wlprs. Ann. vol. iii. p. 77. On the top of Mounts Gough and Victoria (Champion! Hance!).

GESNERIACEÆ.

398. Æschynanthus *Chinensis*, Gardn. et Champ. in Hook. Journ. and Kew Misc. vol. i. p. 328. Trailing over rocks and ravines (Champion! Hance!).

399. Chirita *Sinensis*, Lindl. Bot. Reg. 1844. t. 59.—Hance in Hook. Journ. and Kew Misc. vol. i. p. 141. Common in beds and ravines among the hills (Hance! Champion!).

"Foliis subcarnosis lanceolatis etc. etc. penniveniis, venis indistinctis; corollæ *extus* glabræ lobis intus puberulis; filamentis vix pilosis.—*Folia* marginibus hyalino-cartilagineis, subtus creberrime punctata. *Calyx* plus minus purpureo-suffusus. *Corolla* extus viridis, intus flavescens, marginibus rubescentibus."—*Hance, MSS.*

BIGNONIACEÆ.

400. Tecoma *grandiflora*, Delaun.—De Cand. Prodr. vol. ix. p. 223. Near Tatam (Eyre!).

CONVOLVULACEÆ.

401. Argyreia *acuta*, Lour., De Cand. Prodr. vol. ix. p. 333. Ravines on Mount Victoria (Champion! Hance!).

402. Batatas *edulis*, Chois., De Cand. Prodr. vol. ix. p. 338.—"Sweet Potato" of the colonists. Extensively cultivated on account of its edible tubers (Hance!).

403. Calonyction *speciosum*, Chois., De Cand. Prodr. vol. ix. p. 345. On the outskirts of woods (Hance!).

404. Ipomœa *Pes-capræ*, Sw., De Cand. l. c. p. 349. On the sea-shore (Hance!).

405. Ipomœa *filicaulis*, Blume, De Cand. l. c. p. 353. In sunny places (Hance!).

406. Ipomœa *Sinensis*, Chois., De Cand. l. c. p. 370. Amongst bushes (Hance!).

407. Ipomœa *cymosa*, Rœm. et Schult., De Cand. l. c. p. 371.—*I. fulvicoma*, Hance in Hook. Journ. and Kew Misc. vol. i. p. 176! On the sea-shore.

There seems to be considerable confusion amongst the synonyms of this species and *I. sepiaria*, Ker. Some of Hance's specimens have rooting branches.

408. Ipomœa *chryseides*, Bot. Reg. t. 270.—De Cand. l. c. p. 382. In open places (Hance!).

409. Convolvulus *parviflorus*, Vahl, De Cand. Prodr. l. c. p. 413.—*C. ianthinus*, Hance in Wlprs. Ann. vol. iii. p. 113! In ravines (Hance!).

410. Evolvulus *alsinoides*, Linn., De Cand. Prodr. vol. ix. p. 447.—*E. pudicus*, Hance in Wlprs. Ann. vol. iii. p. 215! On roadsides and in grassy places (Hance!).

411. Cuscuta *reflexa*, Roxb.—Var. *densiflora*, Benth. in Hook. Journ. and Kew Misc. vol. v. p. 58. Little Hongkong (Champion! Hance!).

Dr. Hance's collections contain, from the gardens of Hongkong, *Pharbitis Nil*, Chois., *P. hispida*, Chois., *Quamoclit Phœnicea*, Chois., *Q. vulgaris*, Chois., *Argyræa speciosa*, Swt., *Ipomœa tuberosa*, Linn., and *I. tuberculata*, Rœm. et Schult. (mentioned as *I. pentadactylis* by Benth. in Hook. Journ. and Kew Misc. vol. v. p. 57).

ERYCIBEÆ.

412. Erycibe *glaucescens*, Wall., De Cand. Prodr. vol. ix. p. 464.—*Machilus?* sp., Champ. in Hook. Journ. and Kew Misc. vol. v. p. 198. n. 5! Hongkong (Champion!); also collected about Macao by Millett.

SOLANACEÆ.

413. Lycopersicum *esculentum*, Mill. Dict. n. 2.—De Cand. Prodr. vol. xiii. pars 1. p. 26. "Tomato" of the colonists. Cultivated on account of its edible fruit.

414. Solanum *nigrum*, Linn., De Cand. Prodr. vol. xiii. pars 1. p. 50. In waste places (Hance! Champion!).

415. Solanum *decemdentanum*, Roxb., De Cand. Prod. vol. xiii. pars i. p. 179.—*S. Calleryanum*, Dun., et *S. Osbeckii*, Dun., teste Benth. in Hook. Journ. and Kew Misc. vol. v. p. 129. Hongkong (Champion!).

416. Solanum *ferox*, Linn., De Cand. Prodr. vol. xiii. pars 1. p. 255.—*S. immane*, Hance in Wlprs. Ann. vol. iii. p. 165!—*S. hirsutum*, Roxb. Fl. Ind. vol. i. p. 571. On roadsides (Champion! Hance!).

417. Solanum *Indicum*, Nees ab Esenb., De Cand. Prodr. vol. xiii. pars 1. p. 309. In waste places (Hance!).

418. Solanum *ovigerum*, Dun., De Cand. Prodr. vol. xiii. pars 1. p. 357.—"Egg-apple" of the colonists. Cultivated on account of its edible fruit.

419. Capsicum *bicolor*, Jacq., De Cand. Prodr. vol. xiii. pars 1. p. 413. Cultivated.

420. Capsicum *frutescens*, Linn., De Cand. Prodr. vol. xiii. pars 1. p. 413. Cultivated.

421. Capsicum *conoides*, Mill., De Cand. Prodr. vol. xiii. pars 1. p. 414. Cultivated.

422. Nicandra *physaloides*, Gærtn., De Cand. Prodr. vol. xiii. pars 1. p. 434. Escaped from the gardens, and now almost wild in waste places of the Island (Hance!).

423. Physalis *angulata*, Linn., De Cand. Prodr. vol. xiii. pars 1. p. 448. In Hongkong (Champion!).

424. Lycium *vulgare*, Dun., De Cand. Prodr. vol. xiii. pars 1. p. 509.—*L. Chinense*, Mill.! Cultivated, and naturalized in some parts (Hance!).

425. Datura *alba*, Nees ab Esenb., De Cand. Prodr. vol. xiii. pars 1. p. 541. In waste places (Hance!).

426. Nicotiana *Tabacum*, Linn., De Cand. Prodr. vol. xiii. pars 1. p. 557. Cultivated (Hance!).

SCROPHULARINEÆ.

427. Pterostigma *grandiflorum*, Benth., De Cand. Prodr. vol. x. p. 380. Common on the hills (Champion! Hance!).

428. Pterostigma *capitatum*, Benth., De Cand. Prodr. vol. x. p. 380. In ditches (Hance! Champion!).

429. Limnophila *hirsuta*, Benth. in De Cand. Prodr. vol. x. p. 388. Hongkong (Hance!).

430. Limnophila *punctata*, Blume, De Cand., Prodr. vol. x. p. 388. Hongkong (Hance!).

431. Herpestris *Monniera*, H.B.K., De Cand. Prodr. vol. x. p. 400.—*Anisocalyx limnanthiflorus*, Hance in Wlprs. Ann. vol. iii. p. 195! Common in marshes (Champion! Hance!).

432. Torenia *rubens*, Benth. in De Cand. Prodr. vol. x. p. 410.—*T. concolor*, Lindl. in Bot. Reg. 1846. t. 62. Common on Mount Victoria and other parts of the Island (Champion! Hance!); also at Dane's Island, Whampoa (Hance!).

433. Vandellia *oblonga*, Benth., De Cand. l. c. p. 413. Common (Champion!).

434. Vandellia *crustacea*, Benth., De Cand. l. c. p. 413. Common (Champion! Hance!).

435. Bonnaya *verbenæfolia*, Benth., De Cand. l. c. p. 421. Very common (Hance! Champion!).

436. Buchnera *stricta*, Benth., De Cand. l. c. p. 495. West Point and Little Hongkong (Champion! Hance!).

437. Striga *hirsuta*, Benth., De Cand. l. c. p. 502. Common with Grass, upon which it is supposed to grow parasitically (Champion! Hance!).

438. Centranthera *hispida*, R. Brown, De Cand. l. c. p. 525, var. floribus pallide flavis, Benth. Mounts Victoria and Parker (Champion!).

Mazus rugosus, Lour. (= *M. vandelioides*, Hance in Wlprs. Ann. vol. iii. p. 193!), has not been collected in Hongkong, as is stated by a mistake in Wlprs. Ann. Dr. Hance obtained his specimens from Shanghai (C. F. Tonnerre!), where, I believe, it was also gathered by Fortune.

Russelia juncea, Zucc., *R. sarmentosa*, Jacq., and *Lophospermum erubescens*, Zucc., are cultivated in the gardens.

OROBANCHEÆ.

439. ÆGINETIA *Indica*, Roxb., Benth. in De Cand. Prodr. vol. xi. p. 43. Abundant in ravines, parasitically on roots of grass (Champion! Hance!).

UTRICULARINEÆ.

440. UTRICULARIA *fasciculata*, Roxb., De Cand. Prodr. vol. viii. p. 7.—*U. extensa*, Hance in Wlprs. Ann. vol. iii. p. 3! In marshes (Hance!).

441. UTRICULARIA *uliginosa*, Vahl?, De Cand. l. c. p. 15? In marshes (Champion!).

442. UTRICULARIA *cærulea*, De Cand. Prodr. vol. viii. p. 19.—Wight, Icon. t. 1583. In marshes (Champion! Hance!).

443. UTRICULARIA *diantha*, Rœm. et Schult.—Wight, Icon. t. 1569.—De Cand. Prodr. vol. viii. p. 21. In marshes (Champion!).

444. UTRICULARIA *humilis*, Vahl, De Cand. Prodr. vol. viii. p. 22.—Wight, Icon. t. 1572. In marshes (Champion!).

ACANTHACEÆ.

445. THUNBERGIA *grandiflora*, Roxb., var. *cuspidata*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 55. In a ravine at Saiwan (Champion!).

446. PHLEBOPHYLLUM *apricum*, Benth. in Hook. Journ. and Kew Misc. vol. v. p. 131.—*Gützlaffia aprica*, Hance in Hook. l. c. vol. i. p. 143, et in Wlprs. Ann. vol. iii. p. 213! Towards Tytam Bay and Little Hongkong (Champion! Hance!).

447. CODONACANTHUS *pauciflorus*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 103. Ravines of Victoria Peak (Champion! Hance!).

448. RUELLIA *tetrasperma*, Champ. in Hook. Journ. and Kew Misc. vol. v. p. 132. Victoria Peak (Champion!).

449. BARLERIA *cristata*, Linn., De Cand. Prodr. vol. xi. p. 229. Hongkong (Hance! Hinds!); also at Dane's Island, Whampoa (Hance!).

450. DIPTERACANTHUS? *calycinus*, Champ. in Hook. Journ. and Kew Misc. vol. v. p. 133. Mount Parker (Champion!).

451. LEPIDAGATHIS *hyalina*, var. *dependens*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 253. Abundant near the Buddhist Temple, East Point (Champion! Hance! Seemann!).

452. DILIVARIA *ilicifolia*, Juss., De Cand. Prodr. vol. xi. p. 268. Borders of all the salt-marshes (Champion! Hance!); also gathered by me in Singapore.

453. Rostellaria *procumbens*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 371. On roadsides and in waste places (Champion! Hance!).

454. Adhatoda *Chinensis*, Benth. in Hook. Journ. and Kew Misc. vol. v. p. 134. Common in the ravines of Mount Victoria (Champion! Hance!).

455. Rungia *repens?*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 472. Mount Parker (Champion!).

456. Dicliptera *cardiocarpa*, Nees ab Esenb., De Cand. Prodr. vol. xi. p. 480. On roadsides (Hance! Champion!).

457. Hypoestes *purpurea*, R. Brown, De Cand. Prodr. vol. xi. p. 509.—Var. *glabrior*, Benth. Abundant near the Buddhist Temple at East Point; also at Little Hongkong (Champion! Hance!).

Thunbergia alata, Roj., *Adhatoda Vasika*, Nees ab Esenb., and *Crossandra infundibuliformis*, Nees ab Esenb., are cultivated in the gardens.

LABIATÆ.

458. Pogostemon *parviflorum*, Benth., De Cand. Prodr. vol. xii. p. 152. Mount Parker (Champion!).

459. Dysophylla *auricularia*, Blume, De Cand. Prodr. vol. xii. p. 156. In ditches and moist places (Champion!).

460. Perilla *arguta*, Benth., De Cand. Prodr. vol. xii. p. 164.—*Mentha reticulosa*, Hance in Wlprs. Ann. vol. iii. p. 247! Wild in the Island, but also cultivated by the Chinese on account of its sweet odour (Hance!); the Portuguese of Macao term it "Folha de inferno."

461. Hedeoma *Nepalensis*, Benth. in De Cand. Prodr. vol. xii. p. 244. In waste places (Hance!).

462. Salvia *Fortunei*, Benth., De Cand. Prodr. vol. xii. p. 354. In ravines (Champion! Hance!).

463. Scutellaria *Indica*, Linn.—Benth., De Cand. Prodr. vol. xii. p. 417. In ravines (Champion! Hance! Seemann!).

464. Anisomeles *ovata*, R. Brown, De Cand. Prodr. vol. xii. p. 455. Happy Valley (Champion! Hance! Seemann!).

465. Leonurus *Sibiricus*, Linn., De Cand. Prodr. vol. xii. p. 501. On roadsides (Champion! Hance!); also at Whampoa (Hance!); and Manilla (G. N. Michell!).

466. Leucas *mollissima*, Wall.—Var. *Chinensis*, Benth., De Cand. Prodr. vol. xii. p. 525. On roadsides, Little Hongkong (Champion! Hance!).

Leucas Malayana, Hance in Wlprs. Ann. vol. iii. p. 269, from Singapore, is identical with *L. Zeylanica*, R. Brown, De Cand. Prodr. vol. xii. p. 531!

467. Teucrium *inflatum*, Swartz, De Cand. Prodr. vol. xii. p. 581. In waste places (Hance!).

468. Teucrium *stoloniferum*, Hamilt., De Cand. Prodr. vol. xii. p. 583. In cultivated grounds (Hance !).

Hance's specimens are stoloniferous.

469. Teucrium *fulvum*, Hance in Wlprs. Ann. vol. iii. p. 270.—*T. quadrifarium*, Hamilt., var. ? In ravines (Champion ! Hance !).

Ocimum Basilicum, L., *Origanum Majorana*, L., *Coleus aromaticus*, Lour., and *Rosmarinus officinalis*, L., are cultivated in the gardens.

VERBENACEÆ.

470. Verbena *officinalis*, Linn., De Cand. Prodr. vol. xi. p. 547. On roadsides and in waste places (Champion ! Hance !).

471. Caryopteris *Mastacanthus*, Schauer, De Cand. Prodr. vol. xi. p. 625.—*Mastacanthus Sinensis*, Endl. In ravines of the Black Mountain (Champion ! Hance !).

472. Premna *integrifolia*, Linn.—*P. serratifolia*, Linn., De Cand. Prodr. vol. xi. p. 632. Near the sea (Champion !).

473. Callicarpa *tomentosa*, Willd., Hance in Wlprs. Ann. vol. iii. p. 236. Common in ravines (Champion ! Hance ! Seemann !).

474. Callicarpa *Reevesii*, Wall., De Cand. Prodr. vol. xi. p. 641.—*C. nudiflora*, Hook. et Arn. Bot. Beech. p. 206. t. 46. In ravines (Champion !).

475. Callicarpa *integerrima*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. v. p. 135. Common throughout the Island, in ravines (Champion ! Hance !).

A bush, from 8–10 feet high.

476. Callicarpa *tenuiflora*, Champ. in Hook. Journ. Bot. and Kew Misc. vol. v. p. 135. At Saiwan (Champion !).

477. Callicarpa *longifolia*, Lam., De Cand. Prodr. vol. xi. p. 645. At Saiwan (Champion !); Happy Valley (Hance ! Seemann !).

478. Clerodendron (§ Euclerodendron, Axiliflora) *lividum*, Lindl. Bot. Reg. t. 945.—De Cand. Prodr. vol. xi. p. 673.—*C. pentagonum*, Hance in Wlprs. Ann. vol. iii. p. 238 ! Happy Valley (Hance ! Seemann ! Champion !).

479. Clerodendron *inerme*, R. Brown, De Cand. Prodr. vol. xi. p. 660.—*Volkameria inermis*, Linn. Common on the sea-beach (Hance ! Champion !).

480. Clerodendron *canescens*, Wall., De Cand. Prodr. vol. xi. p. 665.—*C. hæmatocalyx*, Hance in Wlprs. Ann. vol. iii. p. 238. Common near the level of the sea (Champion ! Hance !); also found by me in the little peninsula of Cowlung.

481. Vitex *trifolia*, Linn., De Cand. Prodr. vol. ix. p. 683.—Var. *unifoliata*, Schauer, l. c.—*V. ovata*, Thunb., Hook. et Arn. Bot. Beech. p. 206. t. 47 ! Common on the sea-coast (Hance ! Champion !).

482. Vitex *bicolor*, Willd., De Cand. Prodr. vol. xi. p. 683. On the sea-beach (Hance !).

This appears to be a mere variety of the preceding species.

Several species of *Latana* are cultivated in the gardens.

BORAGINEÆ.

483. Ehretia *longiflora*, Champ. in Hook. Journ. and Kew Misc. vol. v. p. 58. Happy Valley woods (Champion !).

484. Heliophytum *Indicum*, De Cand. Prodr. vol. x. p. 556. Waste places (Champion ! Hance !).

485. Bothriospermum *tenellum*, Fisch. et Mey., De Cand. Prodr. vol. x. p. 116. A weed in ricefields (Champion ! Hance !).

The *Heliotrope* is cultivated in the gardens.

PLANTAGINEÆ.

486. Plantago *major*, Linn.—Var. *Asiatica*, Dcne. in De Cand. Prodr. vol. xiii. p. 694. In waste places (Champion ! Hance !).

PLUMBAGINEÆ.

487. Statice *Sinensis*, Girard., De Cand. Prodr. vol. xii. p. 642.—*S. Fortunei*, Lindl. Bot. Reg. t. 63. Estuaries and salt-water pools towards Saiwan (Champion !).

Plumbago rosea, Linn., and *P. Zeylanica*, Linn., are cultivated in the gardens.

SALSOLACEÆ.

488. Chenopodium *acuminatum*, Willd.—Var. *Vachellii*, Moq., De Cand. Prodr. vol. xiii. pars 2. p. 63.—*C. Vachellii*, Hook. et Arn. Bot. Beech. p. 269 ! In waste places (Hance !).

489. Chenopodium *album*, Moq., De Cand. Prodr. vol. xiii. pars 2. p. 70. In waste places (Hance !).

490. Suæda *Indica*, Moq., De Cand. Prodr. vol. xiii. pars 2. p. 156. In salt-water marshes (Hance !).

Basella rubra, L. (De Cand. Prodr. vol. iii. pars 2. p. 222), is cultivated.

AMARANTHACEÆ.

491. Celosia *cristata*, Moq., De Cand. Prodr. vol. xiii. pars 2. p. 242. In waste places (Hance !).

492. Celosia *argentea*, Moq., De Cand. Prodr. vol. xiii. pars 2. p. 242. In waste places (Hance ! Champion !).

493. Amaranthus *spinosus*, Linn., De Cand. Prodr. vol. xiii. pars 2. p. 260.—Supra, p. 191. In waste places (Hance ! Seemann !).

494. Achyranthes *aspera*, Linn., De Cand. Prodr. vol. xiii. pars 2. p. 314. In waste places (Hance! Champion!).

495. Telanthera *polygonoides*, Moq.—Var. *compacta*, Moq., De Cand. vol. xiii. p. 364.—Supra, p. 191. On roadsides and in waste places.

Gomphrena globosa, Linn., is cultivated in the gardens.

POLYGONACEÆ.

496. Rumex *crispus*, Linn., De Cand. Prodr. vol. xiii. pars 1. p. 44. On roadsides, at Saiwan (Champion! Hance!).

497. Polygonum *Roxburghii*, Meisn., De Cand. l. c. p. 93.—*P. Meyeni*, C. Koch, Linn. vol. xxii. p. 205? In ricefields (Champion! Hance!).

498. Polygonum *viscosum*, Hamilt., De Cand. l. c. p. 103. Hongkong (Hance!).

499. Polygonum *barbatum*, Linn., De Cand. l. c. p. 104. In swamps (Hance!); also at Dane's Island (Hance!).

500. Polygonum *glabrum*, Willd., De Cand. l. c. p. 114. In ditches (Hance!).

501. Polygonum *orientale*, Linn.—Var. *pilosum*, Meisn., De Cand. l. c. p. 123.—*P. pilosum*, Roxb. Hongkong (Champion! Hance!); also at Whampoa (Hance!).

502. Polygonum *Chinense*, Linn., De Cand. l. c. p. 130. In ditches (Champion! Hance! Seemann!).

503. Polygonum *perfoliatum*, Linn., De Cand. l. c. p. 132. Hongkong (Hance!).

LAURINEÆ.

504. Cinnamomum *Zeylanicum*, Breyn., Nees ab Esenb. Syst. Laurin. p. 45. Cultivated in Hongkong (Hance! Hinds!).

505. Cinnamomum *dulce*, Nees ab Esenb. l. c. p. 62. Near the Buddhist Temple; woods at East Point (Champion! Hance!).

506. Camphora *Parthenoxylon*, Nees ab Esenb. in Wall. Pl. Asiat. Rar. vol. ii. p. 72.—*Sassafras Parthenoxylon*, Nees ab Esenb. Syst. Laur. p. 491.—*Phœbe latifolia*, Champ. in Hook. Journ. and Kew Misc. vol. v. p. 197! Happy Valley woods (Champion! Seemann!).

507. Machilus *Thunbergii*, Sieb. et Zucc.—Blum. Mus. Bot. p. 331? Hongkong (Champion!).

508. Alseodaphne *Chinensis*, Champ. in Hook. Journ. and Kew Misc. vol. v. p. 198. Near the waterfall in the Happy Valley (Champion!).

509. Tetranthera *Roxburghii*, Nees ab Esenb. Syst. Laur. p. 515, var. foliis obovatis, umbellulis umbellatis villosis, Benth. Happy Valley woods (Champion! Hance! Seemann!).

510. Tetranthera *polyantha,* Wall., Nees ab Esenb. l. c. p. 545.—*T. floribunda,* Champ. in Hook. Journ. and Kew Misc. vol. v. p. 199! Happy Valley woods (Hance! Champion!).

511. Actinodaphne *angustifolia,* Nees ab Esenb. l. c. p. 594.—*Machilus velutinus,* Champ. in Hook. Journ. and Kew Misc. vol. v. p. 198! Near the Buddhist Temple; on Victoria Peak, Mount Parker, etc., rather common (Champion! Hance!).

512. Actinodaphne *Chinensis,* Nees ab Esenb. l. c. p. 600.—Var. *oblongifolia,* Nees. Common on hills and in ravines (Champion! Hance! Seemann!); also collected in Southern China by Millett.

513. Daphnidium *bifarium,* Nees ab Esenb. l. c. p. 616. In a ravine of Victoria Peak (Eyre!).

514. Litsæa *Ceylonica,* Nees ab Esenb. l. c. p. 626.—Var. *Chinensis,* Benth. in Hook. Journ. and Kew Misc. vol. v. p. 199. Victoria Peak, and woods at East Point, near the Buddhist Temple (Champion!).

515. Cassytha *filiformis,* Linn., Nees ab Esenb. Syst. Laur. p. 642. Common all over the Island (Champion! Hance! Seemann!).

SANTALACEÆ.

516. Henslowia *frutescens,* Benth. in Hook. Journ. and Kew Misc. vol. v. p. 194.—*Viscum heteranthum,* Wall., et *V. platyphyllum,* Sprengl. in De Cand. Prodr. vol. iv. p. 279? Common on the hills, with an erect habit, or often trailing when in underwood (Champion!).

THYMELEÆ.

517. Aquilaria *Malaccensis,* Lam., De Cand. Prodr. vol. ii. p. 59. Happy Valley (Champion! Hance!).

518. Wikstræmia *Indica,* C. A. Meyer.—*Daphne Indica,* Linn.—Hook. et Arn. Bot. Beech. t. 15. Common on the hills (Champion! Hance!).

519. Wikstræmia *nutans,* Champ. in Hook. Journ. and Kew Misc. vol. v. p. 195. Hills about the Happy Valley (Champion! Hance!).

520. Daphne *Fortunei,* Lindl. in Hort. Soc. Journ. vol. i. p. 147.—*D. Genkwa,* Zucc. Happy Valley (Champion!); also cultivated in Hongkong (Hance!).

ELÆAGNEÆ.

521. Elæagnus *Loureiri,* Champ. in Hook. Journ. and Kew Misc. vol. v. p. 196.—*E. latifolia,* Lour. Pl. Cochinch. p. 89? non Linn.! Mount Parker and Mount Gough; also on the mainland (Champion! Hance!).

ARISTOLOCHIACEÆ.

522. Aristolochia *longifolia,* Champ. in Hook. Journ. and Kew Misc. vol. vi. p. 116. Mount Victoria, extremely rare (Champion!).

EUPHORBIACEÆ.

I. Euphorbieæ.

523. Euphorbia *pilulifera*, Linn., supra, p. 99. In waste places (Champion! Hance!).

524. Euphorbia *hypericifolia*, Linn., supra, p. 99. In waste places (Hance!).

525. Euphorbia *Peplus*, Linn. Syst. Veg. (ed. Pers.) p. 483. In cultivated and waste places (Hance!).

II. Hippomaneæ.

526. Stillingia *sebifera*, Mich. vol. ii. p. 213.—*Croton sebiferum*, Linn. Common in the Island as a shrub, though less so in an arboreous state (Champion! Hance!).

527. Stillingia *discolor*, Champ. in Hook. Journ. and Kew Misc. vol. vi. p. 1.—*S. Japonica*, Champ. l. c. (non Sieb. et Zucc.!). Common in the ravines (Champion! Hance! Eyre!).

III. Acalypheæ.

528. Acalypha *Indica*, Linn., Roxb. Fl. Ind. vol. iii. p. 675. In waste places (Champion!).

529. Mappa sp., *M. glabræ* affinis.—In woods (Hance! Champion!).

There are only leaves in the collections of Hance and Champion; they are broad-ovate, acute, furnished at the back with four glands, two of which are situated near the base of the blade, two at the termination of the principal branch of the second vein.

530. Claoxylon *parviflorum*, Adr. Juss., Hook. et Arn. Bot. Beech. p. 212.—*Acalypha spiciflora*, Burrm. (exclud. syn.). In woods (Hance!).

IV. Crotoneæ.

Hancea, Seem. (gen. nov.), *Chætocarpo*, Thwait., affin.—*Char. Gen. Flores* dioici (vel monoici?). Masc. *Calyx* profunde 4-partitus, laciniis ovatis, acuminatis, imbricatis. *Corolla* nulla. *Stamina* numerosa, filamenta libera; antheræ ovales, adnatæ, longitudinaliter dehiscentes. Fœm. *Ovarium* liberum, sessile, setis patentibus persistentibus vestitum, triloculare, loculis 1-spermis. *Stylus* 1, trifidus, lobis fimbriatis. *Capsula* echinata, trilocularis. *Semina* ovata; cotyledones plani, foliacei; albumen copiosum.—Frutex *Hongkongensis*, ramis petiolis*que hirsutis*; foliis *alternis, ovato-oblongis vel ovato-lanceolatis, longe acuminatis, integerrimis vel repando-denticulatis, petiolatis*; stipulis *lineari-lanceolatis*; floribus masc. *racemosis, axillaribus vel terminalibus*; floribus fœm. *solitariis, axillaribus*.

Hancea, which I have named in honour of my friend Dr. H. F. Hance, the indefatigable explorer of the Flora of Hongkong, is closely allied to *Chætocarpus*, Thwaites (Hook. Journ. of Bot. and Kew Misc. vol. vi. p. 300. t. 10 *A*), but differs in its numerous free stamens and echinate capsule, etc. There is as yet only one species known, viz.:—

531. Hancea *Hookeriana*, Seem. (Tab. XCVI.) Hongkong (Champion!).

This remarkable species I have named in honour of Sir W. J. Hooker and Dr. J. D. Hooker, to whose generous assistance and friendly aid in the publication of this work I am so much indebted.

Plate XCVI. Fig. 1 and 2, male flowers; 3 and 4, stamens; 5, young fruit, showing the style; 6, branch with ripe fruit; 7, young seed; 8 and 9, views of ripe seed; 10, section of ditto; 11 and 12, albumen, albumen and embryo; 14, cotyledons:—*all*, with exception of fig. 6, *magnified*.

532. Curcas *purgens*, Med., supra, p. 102. In hedges, and near human habitations (Hance! Seemann!).

533. Manihot *utilissima*, Pohl.—*Jatropha Manihot*, Linn. Cultivated on account of its edible tubers.

534. Ricinus *communis*, Linn., supra, p. 103. In waste places (Hance! Seemann!).

535. Rottlera *tinctoria*, Roxb. Fl. Ind. vol. iii. p. 827.—*B. aurantiaca*, Hook. et Arn. Bot. Beech. p. 270! Common in the ravines and woods of the Happy Valley (Hance! Champion!).

Both the narrow- and broad-leaved varieties are in Hance's collection.

536. Rottlera *paniculata*, A. Juss., Hook. et Arn. Bot. Beech. p. 212. In ravines (Champion!).

537. Rottlera *Chinensis*, A. Juss., Hook. et Arn. Bot. Beech. p. 212. In open places (Hance!).

538. Stipellaria *trewioides*, Benth. in Hook. Journ. and Kew Misc. vol. vi. p. 5. In ravines (Hance! Champion!).

539. Croton *lachnocarpum*, Benth. in Hook. Journ. and Kew Misc. vol. vi. p. 5. Common in woods (Champion! Hance!).

540. Croton *longifolium*, Wall. Cat. n. 7717? In ravines (Hance!).

The specimens are too imperfect to allow of a more accurate determination.

V. Phyllantheæ.

541. Briedelia *tomentosa*, Bl., var. *glabrescens*, Benth.—*B. Loureiri*, Hook. et Arn. Bot. Beech. p. 211! In hedges, East Point (Champion! Hance! Seemann!).

542. Agyneia *bacciformis*, Adr. Juss.—*A. phyllanthoides*, Sprengel.—*Phyllanthus bacciformis*, Roxb., non Linn.! On rocks near the sea-beach (Hance!); also found at Madras (Wight! Shuter!); Ceylon (Champion!, who gathered it at Point de Galle, Thwaites!).

543. Melanthesa *Chinensis*, Blum. Bijdr.—*M. cernua*, Benth. in Hook. Journ. Bot. vol. i. p. 491, non Dcne.—*Phyllanthus lucens*, Poir., Hook. et Arn. Bot. Beech. p. 210. In the woods (Champion! Hance! Seemann!).

544. Melanthesa, sp. Hongkong (Seemann!).

The specimens are too imperfect for exact identification.

545. Phyllanthus *Maderaspatana*, Linn.? Hongkong (Champion!).

546. Phyllanthus *cinerascens*, Hook. et Arn. (Tab. XCVII.); fruticosa, glabra, ramis striatis

cortice cinereo, foliis parvis obovatis vel ovalibus obtusissimis vel retusis coriaceis glabris approximatis fasciculatis vel 2–4 ad ramulos breves juniores, stipulis cordatis longe acuminatis fimbriatis, floribus 3–5-nis pedicellatis 6-fidis, masculis triandris, fœmineis 3-gynis, stigmatibus bilobis, lobis integerrimis, ovario triloculare, loculis 2-ovulatis.—*P. cinerascens,* Hook. et Arn. Bot. Beech. p. 211. On the hills (Champion! Hance!); Macao (Millett!).

Plate XCVII. Fig. 1, portion of branch, showing the stipules; 2, male flower, not open; 3, male flower, open; 4, female flower; 5, pistil; 6 and 7, sections of ovary:—*all magnified.*

547. Phyllanthus *Nisuri,* Linn., Bot. Beech. p. 210. In sunny places, Hongkong (teste Benth.!).

548. Phyllanthus *urinaria,* Roxb. Fl. Ind. vol. iii. p. 660.—*P. Cantoniensis,* Horn. In sunny places (Hance!).

549. Emblica *officinalis,* Gærtn.—*Dichelactina nodicaulis,* Hance in Wlprs. Ann. vol. iii. p. 376! Ravines (Champion! Hance!).

550. Glochidion *molle,* Hook. et Arn. Bot. Beech. p. 210.—*Bradleia ovata,* Wall. Cat. n. 7852. Happy Valley woods (Champion!).

551. Glochidion *ereocarpum,* Champ. in Hook. Journ. and Kew Misc. vol. vi. p. 6. Happy Valley woods (Champion! Hance! Seemann!).

VI. Buxeæ.

552. Goughia *Nilgerrensis,* Wight, Icon. t. 1877 et 1878. Woods towards Little Hongkong, where it is abundant (Champion! Hance! Seemann!).

VII. Scepareæ.

553. Scepa *Roxburghii.*—Var. *Chinensis,* Seem. *S. Chinensis,* Champ. in Hook. Journ. and Kew Misc. vol. vi. p. 72! Common in the Island (Champion!).

VIII. Antidesmeæ.

554. Antidesma *Bunius,* Sprengl., Tul. in Ann. Nat. Par. ser. 3. vol. xv. p. 186. Woods (Champion!).

555. Antidesma *Japonicum,* Sieb. et Zucc., Fl. Jap. Fam. Nat. p. 88. Happy Valley (Champion! Hance!).

556. Antidesma *paniculatum,* Roxb., Tul. l. c. p. 228. West Point (Champion!).

Buxus sempervirens, L., and *Euphorbia splendens,* Boj., are cultivated in the Island.

URTICACEÆ.

557. Pouzolsia *hispida,* J. J. Benn., Pl. Jav. Rar. p. 66, var.? *glabrata,* Benth. in Hook. Journ. and Kew Misc. vol. vi. p. 73.—*Hyrtandra Javanica,* Miq. Pl. Jungh. p. 25. In shady places (Champion! Hance!).

558. Bœhmeria *nivea*, Gaud.—Hook. in Hook. Journ. of Bot. and Kew Misc. vol. iii. p. 315. t. 8. Common in ravines (Champion!). I found it cultivated at Cowlung, on the Chinese mainland.

559. Morocarpus? *microcephalus*, Benth. in Hook. Journ. and Kew Misc. vol. vi. p. 74. Ravines of Victoria Peak (Champion!).*

ARTOCARPEÆ.

560. Morus *alba*, Linn. Cultivated (Champion! Hance!).

561. Ficus (Urostigma) *nitida*, Thunb.—*Urostigma nitidum*, Miq. in Lond. Journ. Bot. vol. vi. p. 582. On roadsides, near habitations and temples (Hance! Seemann!), apparently cultivated.

562. Ficus (Urostigma) *angustifolia*, Roxb.—*Urostigma nervosum*, Miq. in Lond. Journ. Bot. vol. vi. p. 585. Happy Valley woods (Champion! Hance! Seemann!).

563. Ficus (Plagiostigma) *pyriformis*, Hook. et Arn. Bot. Beech. p. 216. Miq. in Lond. Journ. Bot. vol. vii. p. 437. In the beds of watercourses (Champion! Hance! Seemann!).

564. Ficus (Sycidium?) *variolosa*, Lindl.—Benth. in Lond. Journ. Bot. vol. i. p. 492. Common in the ravines (Champion!).

565. Ficus (Sycidium?) *impressa*, Champ. in Hook. Journ. and Kew Misc. vol. vi. p. 76. Ravines (Champion!).

* *Cannabis sativa*, L., is cultivated in Hongkong; *Humulus Japonicus*, Sieb. et Zucc., was found by me in hedges around Canton: as the latter is extremely scarce and interesting, I have introduced a figure of it in this work, though the species does not belong to the Flora of Hongkong.

Humulus Japonicus, Sieb. et Zucc. (Tab. XCVIII.); caule volubili retrorsum aculeato, foliis e basi cordata suborbicularibus palmato-5–7-lobis, lobis ovato-oblongis vel oblongis acutis acuminatisve dense et acute serratis scaberrimis, petiolis laminam folii superantibus, paniculis masculis terminalibus elongatis subaphyllis, perianthii laciniis acutis hispidis, capitulis fœmineis axillaribus et terminalibus pedunculatis solitariis vel subpaniculatis, bracteis floralibus late ovato-deltoideis acutis margine aculeato-ciliatis hispidissimis foliaceis, quam nucula lenticularis vix dimidio longioribus, eglandulosis.—*H. Japonicus*, Sieb. et Zucc., Florulæ Jap. Fam. Natur. sect. ii. p. 89. Hedges about Canton, growing in the same manner as does our Wild Hop in Europe (Seemann!); also found in Japan (Siebold).

Though this species was published many years ago by Von Siebold and Zuccarini, we still find nearly all our systematic works asserting that there is only *one* species of *Humulus*, as there seems to be only one species of *Cannabis*. This assertion is however entirely owing to the fact that *H. Japonicus* was published in rather an obscure place, and its existence is therefore not generally known, for there can be no doubt whatever that it is a very good species, at once distinguished from the common Hop by the entire absence of those resinous, spherical glands, with which the scales of the imbricated heads of the latter are scattered, and to which they owe their value in the preparation of beer, making a substitution of the one for the other, for economical purposes, an impossibility. Other differences of importance are to be found in the hispid covering of the leaves and bracts, and the length of the petiole, which always exceeds that of the blade of the leaf, to say nothing of the straight axis of the male panicles (by an error in the drawing flexuose), distinguishing them from the flexuose ones of *H. Lupulus*.

Plate XCVIII. Fig. 1, male flower, closed; 2, ditto, open; 3 and 4, perigonial leaves of ditto; 5, stamen; 6 and 7, hair of stem and branches; 8, female flower; 9, perigonal leaf of ditto; 10, pistil; 11, section of ditto; 12, entire seed; 13, section of ditto; 14, embryo:—*all magnified*.

566. Ficus (Leiosycea) *Championi,* Benth. in Hook. Journ. and Kew Misc. vol. vi. p. 76. Woods of the Happy Valley (Champion!).

567. Ficus (Eriosycea) *hibiscifolia,* Champ. in Hook. Journ. and Kew Misc. vol. vi. p. 77. Common in the ravines (Champion! Hance! Seemann!).

568. Ficus (Eriosycea) *hirta,* Vahl.—Miq. in Lond. Journ. Bot. vol. vii. p. 456. In ravines (Champion! Hance! Seemann!).

Ficus elastica, Roxb., is cultivated in Hongkong; *Ficus stipulata*, Thunb., though very common on walls and rocks at Canton, and other parts of Southern China, has not yet been gathered in Hongkong.

CELTIDEÆ.

569. Sponia *argentea,* Planch. in Ann. Sc. Nat. Par. ser. 3. vol. x. p. 323. On the edges of woods (Champion! Hance! Seemann!).

BETULACEÆ.

570. Alnus? sp. n., affinis *A. Japonicæ,* Sieb. et Zucc. Hongkong (Champion!).

MYRICEÆ.

571. Myrica *rubra,* Sieb. et Zucc.; forma foliis paullo latioribus et obtusioribus.—*Benth.* Hongkong (Champion!).

CUPULIFERÆ.

572. Castanea *Chinensis,* Sprengl. Syst. vol. iii. p. 856.—*C. tribuloides,* Lindl. in Wall. Pl. As. Rar. vol. ii. p. 6!—*Fagus castanea,* Lour. Fl. Cochin. (ed. Ulyssipon.) p. 571!—*Quercus tribuloides,* Smith in Rees' Encycl. n. 13!—*Q. ferox,* Roxb. Fl. Ind. Or. vol. ii. p. 640! Wight, Icon. Pl. t. 218!—*Q. Eyrei,* Champ. in Hook. Journ. of Bot. and Kew Misc. vol. vi. p. 114! Abundant in Wang-ny-chung Wood, on the east side of the Happy Valley (Champion!).

A very variable species. Leaves sometimes serrated. It is widely diffused in Asia, viz.:—Nepal (Wallich! Hooker and Thomson!), Assam (Herb. Hook.!), Kumaon (Strachey and Winterbottom! Thomson!), Surju-Valley (Madden!), Khassya (Th. Lobb!, Hooker and Thomson!), Sikkim (Hook. and Thoms.!).

573. Castanea *concinna,* Champ. (Tab. LXXXVI.); foliis oblongo-lanceolatis acuminatis integerrimis basi cuneatis coriaceis supra glabris subtus ramulis inflorescentiaque incano-tomentosis, amentis subpaniculatis masculis pluribus fœmineis brevibus solitariis terminalibus, fructu echinato.—*C. concinna,* Champ. in Hook. Journ. of Bot. vol. vi. p. 115. In the Happy Valley woods (Seemann! Champion! Hance!).

A tree about 30 feet high. Leaves 3 inches long, 9 lines broad. Nut about the size of a small hazelnut.

Plate LXXXVI. Fig. 1, one of the lower leaves; 2, branch of male flowers; 3 and 4, male flowers; 5, seed. Fig. 3 and 4 are *magnified.*

574. Quercus (Lepidobalanus) *cornea,* Lour. (Tab. LXXXVII.); ramulis foliisque novellis to-

mentellis demum glabris, foliis petiolatis oblongo-lanceolatis utrinque acuminatis serratis glabris, amentis simplicibus, floribus sessilibus, inferioribus fœmineis, superioribus masculis, cupulis hemisphæricis extus squamis ovato-triangularibus dense imbricatis vestitis intus glabris.—*Q. cornea,* Lour. Fl. Cochin. p. 572.—*Synædrys ossea,* Lindl., Introd. Nat. Syst. vol. ii. p. 441 !—Benth. in Hook. Journ. and Kew. Misc. vol. vi. p. 112. In the Happy Valley woods (Hance, Champion, Seemann, Eyre).

A tree, from 35 to 40 feet high, furnishing the edible fruit known in China under the names of Shi-Li (*i. e.* Stony Chestnut), or King-Li (*i. e.* Pekin Chestnut). The leaves are from 2–3 inches long, and in the broadest part about 9 lines broad. The acorn and cup of this remarkable species have been described by H. F. Hance (Hook. Journ. and Kew Misc. vol. i. p. 175) in the following words:—Glans ossea, basi rotundata, parte superiori depressa vel interdum pulvinata, indumento raso tomentoso instrato, apice subumbonata, maxima pro parte cupula immersa, incomplete 4–5-locularis. Cupula lignosa, hemisphærica, glande parum brevior, extus squamis ovato-triangularibus dense imbricatis vestita, intus glabra. Semen pendulum, totam glandem replens; testa membranacea; embryone exalbuminoso, orthotropo; cotyledonibus maximis, 4–5-lobis, rimoso-sulcatis; radicula supera.

Plate LXXXVII. Fig. 1, branch, with male and female flowers; 2, a male flower; 3 and 4, section of female flower; 5 and 6, ripe fruit; 7, fruit, with the cup removed; 8, section of the fruit. Fig. 1, 2, 3, and 4, *magnified.*

575. Quercus (Lepidobalanus) *inversa,* Lindl. (Tab. LXXXVIII.); ramis tomentosis, foliis oblongo-ellipticis longe cuspidato-acuminatis integerrimis nunc apice serratis coriaceis glabris superne læte virentibus subtus glauco-tomentosis, basi in petiolum folio 6-plo breviorem angustatis, amentis axillaribus densis cylindricis erectis 2–8-fasciculatis, fructibus biennibus sessilibus, cupulis hemisphæricis suberoso-lignosis extus squamis mucronatis cano-tomentosis vestitis intus albo-velutinis, glandibus maturis ad tres quartas longitudinis e cupulis emersis ovalibus glabris sparse pruinosis spadiceis vertice (e reliquiis albentibus calycis laciniarum) umbonatis.—*Q. inversa,* Lindl. in Paxt. Pl. Gardn. vol. i. p. 59, cum icon. xylog.—*Q. thalassica,* Hance, in Hook. Journ. Bot. and Kew Misc. vol. i. p. 176! In the woods (Fortune! Champion! Hance!).

A tree, from 20 to 30 feet high. Leaves, including petiole, from 3½ to 4 inches long, and 1 inch broad. Common in the temperate parts of the Khasia Mountains (Hooker and Thomson! Th. Lobb! Griffith!).

Plate LXXXVIII. Fig. 1, a branch of male flowers; 2, a male flower; 3, ripe fruit; 4, fruit, with the cup removed; 5, 6, 7, sections of fruit. Fig. 1 *magnified.*

576. Quercus (Lepidobalanus) *Harlandi,* Hance (Tab. LXXXIX.); foliis ellipticis cuspidato-acuminatis integris vix undulato-subrepandis, supra medium parce sinuolato-serratis coriaceis, læte viridibus, supra nitidis, basi in petiolum folio sexies breviorem angustatis, amentis solitariis simplicibus, floribus sessilibus, fructibus biennibus sessilibus laxiuscule spicatis, cupulis hemisphæricis suberoso-lignosis extus squamis griseis latis mucronatis arctissime adpressis vestitis intus griseo-sericeis, glandibus maturis maxima pro parte e cupulis emersis oblongis vel subcordatis glaberrimis vix prope basin pruinosis castaneis apice conico-umbonatis.—*Q. Harlandi,* Hance, in Wlprs. Ann. vol. iii. p. 382. In thick woods (Hance! Seemann!).

A tree about 20 feet high. Largest leaves from 6 to 8 inches long, and generally 2 inches broad. Male flowers with six divisions of the perigon, and 12 stamens. The Oak no. 3, mentioned by Bentham at page 113 of Hook. Journ. and Kew Misc., appears to me, judging from specimens before me, a crippled form of *Q. Harlandi,* Hance, it having been gathered on Victoria Peak, a very exposed position.

Plate LXXXIX. Fig. 1, one of the lower leaves; 2, a branch of male flowers; 3, a male flower; 4, and 5, sections of young fruit; 6, styles of the same; 7 and 8, ripe fruit; 9, 10, and 11, sections of the same. Fig. 3, 4, 5, and 6, *magnified.*

577. Quercus (Gyrolecana) *Championi,* Benth. (Tab. XC.); ramulis novellis furfuraceo-tomentosis, foliis petiolatis obovatis oblongisve obtusis vel brevissime acuminatis coriaceis supra nitidis subtus lepidoto-incanis, amentis tomentosis masculis subfasciculatis fœmineis solitariis dissitifloris, cupulis tomentosis concentrice annulatis.—*Q. Championi,* Bth. in Hook. Journ. and Kew Misc. vol. vi. p. 113. Extending from Happy Valley woods to Victoria Peak (Champion! Eyre!).

A tree. Leaves from 2 to 3 inches long, and 1½ inches broad.

Plate XC.—Fig. 1, branch, with male flowers; 2 and 3, male flowers; 4, a stamen; 5, pollen-masses; 6, stellate hair of the anthers; 7, branch, with female flowers; 8, branch, with very young fruit; 9, section of very young fruit; 10, pistil; 11, section of ovary; 12, an ovulum:—*all,* with exception of 1, 7, and 8, *magnified.*

578. Quercus (Gyrolecana) *salicina,* Blume. (Tab. XCI.); ramulis novellis pubescentibus, foliis e basi acutiuscula vel subrotundata lineari-lanceolatis acuminatis integerrimis vel rarissime remote serrulatis coriaceis subtus plerumque glaucis, adultis glabris, novellis subtus adpresse pubescentibus, venis in utroque latere 7–14 tenuissimis arcuato-patulis vix conspicuis, amentis solitariis simplicibus, cupulis concentrice annulatis.—*Q. salicina,* Blume, Mus. Bot. L.-Batavum, vol. i. p. 305.—*Q. bambusæfolia,* Hance, mss. Happy Valley woods (Champion! Hance! Seemann!).

A tree, 40 feet high. Leaves, including petiole, about 3 inches long, and 4 lines broad. Male flowers with a six-lobed perigonium and 6 stamens.

Plate XCI.—Fig. 1, a branch, with male flowers; 2, male flower; 3, a branch, with female flowers; 4, pistil; 5 and 6, section of the same; 7, ripe fruit, with the cup removed; 8 and 9, sections of the same. Fig. 2, 4, 5, and 6, *magnified.*

579. Quercus (Castaneopsis) *fissa,* Champ. (Tab. XCII.); foliis petiolatis ample ellipticis calloso-pauciserratis supra glabris subtus tenuiter argenteo-lepidotis, amentis glabris paniculatis, fructibus spicatis, cupulis ovoideis irregulariter zonatis glandem includentibus demum irregulariter fissis.—*Q. fissa,* Champ. in Hook. Journ. and Kew Misc. vol. vi. p. 114. Abundant on the skirts of the Happy Valley woods (Champion! Eyre!).

A tree. Leaves from 6 to 8 inches long, and 2–3 inches broad.

Plate XCII.—Fig. 1, a branch, with male flowers; 2, a male flower; 3, pollen-masses; 4, a branch, with very young fruit; 5, pistil; 6 and 7, sections of the same; 8, section of the ovary; 9, an ovulum; 10, section of the same; 11, ripe fruit; 12, fruit, with the cup removed; 13 and 14, sections of fruit; 15, cells of ditto; 16, starch-granules of the latter:—*all,* with exception of 1, 4, 11, 12, 13, and 14, *magnified.*

PIPERACEÆ.

580. Piper *arcuatum,* Blume, Miq. Syst. Pip. p. 332.—Nov. Act. vol. xxi. suppl. t. 58. Hongkong (Hance!).

581. Chavica *Sinensis,* Champ. in Hook. Journ. and Kew Misc. vol. vi. p. 116. Ravines of Victoria Peak (Champion!).

582. Chavica *Betle,* Miq. Syst. Pip. p. 228.—*Piper Betle,* Linn. Hongkong (Hance!).

CHLORANTHACEÆ.

583. Sarcandra *chloranthoides*, Gardn., Contrib. to a Fl. of Ceyl. p. 6. In ravines (Hance! Champion!).

CONIFERÆ.

584. Pinus *Sinensis*, Lamb., Endl. Synop. Conif. p. 185. The most common tree in the Island (Champion! Hance! Seemann!).

585. Cunninghamia *Sinensis*, R. Brown, Endl. Synop. Conif. p. 193. Happy Valley, but only in isolated specimens (Hance! Seemann!).

586. Gnetum *scandens*, Roxb., Fl. Ind. vol. iii. p. 598 (1832).—*G. funiculare*, Blume, Nov. Fam. 32 (1833).—Endl. Synop. Conif. p. 252. Common in the Happy Valley and on Victoria Peak (Champion! Hance!).

Cycas revoluta, Thunb., is cultivated in the gardens.

PALMÆ.

587. Zalacca, sp.? In woods (Hance!).

There are only the leaves of this species; future collectors would do well to gather the flowers and fruit, as this species seems to be new.

588. Rhaphis *Kwanwortsik*, Herm., Wendl. Index Palm. p. 34.—*Chamærops Kwanwortsik*, Sieb. In woods (Hance!).

589. Phœnix *acaulis*, Roxb., Griff. Palms of British India, p. 137. t. 228. In sunny places (Hance!).

Very little importance can be attached to the stemless character of some of the *Phœnices* as a mark of specific distinction. *P. reclinata*, Jacq., for instance, had for years been a "planta acaulis," in the Imperial Gardens at Schönbrunn, near Vienna, and was described as such by Jacquin, when all at once one of the old specimens, growing in the ground of one of the hothouses, began to produce trunks which, in the course of four years, attained a height of 20 feet.

590. Cocos *nucifera*, Linn., supra, p. 204. Occasionally planted on the sea-shore, but does not thrive well (Hance!).

PANDANEÆ.

591. Pandanus *fascicularis*, Lam., Kth. Enum. vol. iii. p. 98. Near the sea-shore (Hance! Seemann!); used for making hedges; the tender shoots are eaten.

AROIDEÆ.

592. Pothos *Seemannii*, Schott in Bonplandia, vol. v. p. 44. On rocks, common (Champion! Hance! Seemann!).

593. Alocasia *commutata*, Schott, Synop. Aroidearum, p. 45. Hongkong (Hance!).

594. Typhonium *divaricatum*, Blume, Schott, Synop. Aroidearum, p. 18. Hongkong (Hance!).

595. Rhaphidophora *Hongkongensis*, Schott in Bonplandia, vol. v. p. 44. Hongkong (Hance!).

"In order to be intelligible respecting *Rhaphidophora*, it is necessary to state that this truly distinct genus has already been several times rectified by its author (Hasskarl). Its type is *Pothos pertusus*, Roxb., *Scindapsus pinnatus*, *pinnatifidus* and *decursivus*, being considered identical, are referred to it (*vide* Hassk. Plant. Jav. Rar. Berol. 1848), whilst those species of the group formerly referred by me (Meletem.) to *Scindapsus*, the ovary of which has several ovula, form the genus *Scindapsus*, Hassk. After an examination of the Hookerian Herbarium, I am able to state that the following species belong to it, viz.:—1, *Rhaphidophora angustifolia*, Schott (*Scindapsus angustifolius*, Hassk.); 2, *R. lingulata*, Schott (*S. lingulatus*, Hassk.); 3, *R. Peepla*, Schott (*S. Peepla*, Schott, Melet.); 4, *R. Lobbii*, Schott (resembling in some measure the *R. Peepla* from Java); 5, *R. lancifolia*, Schott (*Peepla* from Khasia); 6, *R. calophyllum*, Schott (*Peepla* from Sikkim); 7, *R. Hookeri*, Schott (from Khasia), all of which belong to *Monstera*, subgenus *Caioraphus*, C. Koch; 8, *R. caudata*, Schott; 9, *R. pertusa*, Schott (probably *R. lacera*, Hassk.); 10, *R. glauca*, Schott (*S. glaucus*, Schott, Melet.); 11, *R. pinnatifida*, Schott (*S. decursivus*, Zoll.); 12, *R. pinnata*, Schott (*S. pinnatus*, Schott, Melet.); 13, *R. Hügelii*, Schott (from Manilla); 14, *R. decursiva*, Schott (*S. decursivus*, Schott, Melet.); 15, *R. affinis*, Schott (from Churra); 16, *R. eximia*, Schott (discovered by J. D. Hooker in Sikkim). The latter nine species range themselves under C. Koch's subgenus *Scindapsus* and *Scaphospatha* of his genus *Monstera*. Including *R. Hongkongensis*, which must be placed here until better materials have extended our knowledge of it, the genus *Rhaphidophora* now counts seventeen species."—*Schott in Bonplandia*, vol. v. p. 45.

ZINGIBERACEÆ.

596. Alpinia *Galanga*, Sw. Ravines of Mount Victoria (Champion! Hance!).

597. Alpinia *nutans*, Rosc. Ravines of Mount Victoria (Champion! Hance!).

598. Hellenia *Chinensis*, Willd. Ravines of Mount Victoria (Champion! Hance!).

599. Costus *speciosus*, Smith. In ravines (Hance!).

Canna Indica, L., is cultivated in the gardens, and sometimes met as a fugitive from there.

MUSACEÆ.

600. Musa *sapientum*, Linn. Cultivated on account of its edible fruit.

The wild *Musa*, found by Champion in ravines of Mount Parker (without flower or fruit), has not since been met with.

ORCHIDEÆ.

(*Auctore H. G. Reichenbach, fil.*)

601. Platanthera *Galeandra*, Rchb. fil., Linnæa, vol. xxv. p. 226.—*Platanthera Championi*, Lindl. in Hook. Journ. Bot. 1855. p. 37. Hongkong (Seemann! Hance!).

602. Platanthera *Susannæ*, Lindl. Hongkong (Hance!).

603. Habenaria *linguella*, Lindl.—*Centrochilus gracilis*, Schauer. Hongkong (Seemann!).

604. Glossaspis *antennifera*, Rchb. fil., Linnæa, xxv. p. 225. Hongkong (Hance!).

605. Cœloglossum *peristyloides*, Rchb. fil. in Bonpl. vol. iv. p. 321; aff. *C. denso* calcare ovarium non æquante apice simpliciter acuto, labelli laciniis subæqualibus, lateralibus divaricatis linearilanceis, lacinia media ligulata acuta.—*Habenaria peristyloides*, R. Wight, Icon. vol. v. t. 1702! *Planta* bipedalis, nigro-siccata. *Folia* 5, lanceolata, acuminata, duos tresve pollices longa, dimidium pollicem lata. *Folia* superiora in bracteas abeuntia. *Spica* elongata, multiflora; flores illis *Gymnadeniæ odoratissimæ* subæquales, laxiores. *Bracteæ* lanceolatæ, aristatæ, ovaria subæquantes. *Sepala* oblongo-lanceolata, linea media extus carinata. *Tepala* subæqualia, ungui labelli adnata. *Labellum* liberum, trifidum, partitiones laterales lanceæ acuminatæ divaricatæ, partitio media ligulata obtusa abbreviata. *Calcar* filiforme, ovario brevius. Hongkong (Hance!).

606. Goodyera *procera*, Hook. Hongkong (Hance! Seemann!).

607. Spiranthes *Australis*, *β*, *pudica*, Lindl. Hongkong (Hance!).

608. Hæmaria *discolor*, Lindl. Hongkong (Hance!).

609. Dienia *congesta*, Lindl. Orchid. p. 22. *Planta* pedalis–tripedalis. *Pseudobulbus* vaginis hyalinis occultus. *Folia* terna–quina, oblonga, basi cuneata, apice acuminata, quinquenervia, septem usque pollices longa. *Pedunculus* longe exsertus, angulatus (siccus), apice cylindraceo-racemosus. *Bracteæ* subulatæ, pedicellos superantes. *Sepala* oblongo-lanceolata, obtuse acuta. *Tepala* linearifalcata. *Labellum* ovatum, apice trilobulum, lobulo medio porrecto, omnibus callosis. *Gynostemium* latum, super labellum flexum. *Capsulæ* oblongæ, tuberculatæ.—Specimina quam specimina Nepalensia majora. Hongkong. Novemb. (Hance!).

610. Sturmia *nervosa*, Bonpl. vol. iii. p. 250.—*Liparis nervosa*, Lindl. *Planta* spithamæa. *Folia* tria, lanceolata, acuminata, bene plicata. *Pedunculus* elongatus, angulatus, apice distanti-racemosus. *Bracteæ* acuminatæ, ovariis pedicellatis subbreviores. *Sepala* lateralia, semiovata, acuta; sepalum dorsale lineare, acutum. *Tepala* linearia, acuta. *Labellum* flabellatum, apice obtusangulum, retusum, cum apiculo; margine hinc subtiliter crenulatum; falculæ geminæ ante basin. *Gynostemium* supra labelli basin adnatum, ab apice membrana hinc denticulata medium versus alatum. Hongkong (Hance!).

611. Sturmia *longipes*, (*Liparis longipes*, L. O. p. 30). Hongkong (Seemann).

612. Pholidota *Chinensis*, Lindl. in Journ. Hort. Soc. vol. ii. p. 308; Misc. p. 16. 1847. *Pseudobulbi* bipollicares, oblongo-tetragoni. *Folia* post anthesin prope semipedalia, a basi lineari teretiuscula, oblonga, acuta, trinervia, anthesi adhuc valde tenuia, margine undulata, gemina. *Pedunculus* curvatus, bracteis æquidistantibus cymbiformibus acutis scariosis. Flos illi *Pholidotæ imbricatæ* duplo major. *Sepala* oblonga, acuta, dorso carinata. *Tepala* linearia, acuta. *Labellum* basi saccatum, trilobum; lobi laterales semiovati, lobus medius ovatus acutus. *Gynostemium* depresso-anceps, utrinque alatum, androclinii limbo erecto supra androclinium more *Cœlogynis*; rostelli processus obtuse triangulus, limbus inferior foveæ obtuse triangulæ productus. *Anthera* obtuse triangula, more generis quadrivalvis. Hongkong (Hance! Seemann!).

613. Ania *latifolia*, Lindl.? A single specimen, with faded flowers and destitute of anthers. Hongkong (Hance!).

614. Spathoglottis *Fortuni*, Lindl. Bl. Reg. 1845. vol. i. p. 19. *Folia* terna–quaterna, cuneata, lanceolata, acuminata, nervosa, plicata. *Pedunculus* teretiusculus, laxe vaginatus, superne racemosus,

minute puberulus. *Bracteæ* lanceæ, acuminatæ, pedicellis breviores seu æquales. *Ovaria* cum pedicellis duas pollicis tertias longa, velutina. *Sepala* oblonga, obtuse acutiuscula, extus velutina. *Tepala* latiora, firmiora, basi cuneata. *Labellum* tripartitum, partitiones laterales, ligulatæ, obtusæ, antrorsum curvulæ; partitio media linearis basi utrinque unidentata, apice dilatata, rhombea, medio exciso-biloba; lamellæ obtusangulæ, super unguem in nervos incrassatos baseos exeuntes. *Gynostemium* curvum, clavatum, utrinque anguste alatum. Hongkong (Seemann! Hance!).

615. Pachystoma *Chinense*. Hongkong (Seemann! Hance!).

616. Phajus *grandifolius*, Lour. Hongkong (Hance!).

617. Arundina *Philippii*, Rchb. fil., Linnæa, vol. xxv. p. 227, aff. *A. Chinensi*, Bl., labello medio trilobo, lobis lateralibus obtusangulis, lobo medio oblongo, carinis ternis per discum, androclinio cucullato.—*Arundina Chinensis*, Lindl. in Florula Hongk.?—*Planta* humilis. *Folia* lineari-lancea. *Pedunculus* apice pariflorus. *Bracteæ* triangulæ, vulgo minutæ. *Sepala* lancea. *Tepala* cuneato-ovata, acuta. Hongkong (Hance! Seemann!).

618. Cymbidium *ensifolium*, Sw.—*C. micans*, Schauer! Hongkong (Hance!).

619. Cymbidium *xiphiifolium*, Lindl. Hongkong (Hance!).

620. Calanthe *gracilis*, Lindl.—*Limatodes gracilis*, Lindl. Hongkong (Seemann!).

621. Acampe *multiflora*, Lindl.? fruct. Hongkong (Seemann!).

622. Sarcanthus *rostratus*, Lindl.? sine fl. Hongkong (Hance!).

623. Cypripedium *purpuratum*, Lindl.—*C. Sinicum*, Hance, in Wlprs. Ann. vol. iii. p. 602! Hongkong (Hance!).

Obs. Lindley, in Hook. Journ. Bot. 1855, habet "Griffith's *Appendicula teres* appears to be a *Ceratostylis*." Certe certius est *Ceratostylis*, et quidem *C. teres*, Rchb. fil., Bonpld. vol. ii. p. 89.

AMARYLLIDEÆ.

624. Crinum *Asiaticum*, Linn., Kth. Enum. vol. v. p. 547. Sea-shore, Shek-o (Hance!); also at Dane's Island, Whampoa (Hance!).

Zephyranthes rosea, Hook., *Narcissus Tazetta*, L., and *Hippeastrum regium*, Herb., are cultivated in the gardens.

HYPOXIDEÆ.

625. Hypoxis *minor*, Don.—*H. curculigoides*, Wall. In grassy places (Hance!); also found in tropical Himalaya, Kashmir to Sikkim.

Mentioned in the Introduction (supra, p. 356) as "a pretty little *Curculigo*, with leaves like a *Luzula*."

IRIDEÆ.

626. Pardanthus *Chinensis*, Ker, in Arn. Bot. p. 247.—*Ixia Chinensis*, Linn. Saiwan (Champion!); according to Hance cultivated in the gardens.

DIOSCOREÆ.

627. Dioscorea *aculeata*, Linn., Wight, Icon. t. 2060. Hongkong (Hance!).

SMILACEÆ.

628. Ophiopogon *gracilis*, Kunth, Enum. vol. v. p. 298.—*O. spicatus*, Schauer, non Gawl. In grassy places (Hance!).

629. Ophiopogon *spicatus*, Gawl., Kth. Enum. vol. v. p. 299. In grassy places (Hance! Champion!).

630. Smilax *ferox*, Wall.; glabra, ramis teretibus aculeatis, ramulis subangulatis, foliis ramulaceis ovato-oblongis ovato-lanceolatis vel obovatis acuto-mucronatis basi rotundatis vel attenuatis 5-nerviis subtus glaucescentibus, umbellis axillaribus solitariis, petiolum carinatum ecirratum superantibus, perigonii foliolis exterioribus ovato-oblongis interioribus paulo brevioribus oblongo-lanceolatis, staminibus liberis, antheris apertis late oblongis filamento triplo brevioribus, baccis globosis 3-spermis. Trailing over shrubs (Champion! Hance!). Also collected in China by Fortune (n. 71), and in the Khassiya Hills by Griffith.

631. Smilax *lancæfolia*, Roxb. (Tab. XCIX.); glabra, inermis vel sparse aculeata, ramis teretibus, foliis oblongis acuminatis, acumine complicato-recurvatis, in petiolum dorso carinatum decurrentibus 3–5-nerviis, umbellis axillaribus simplicibus longe pedunculatis, pedunculis supra basin bibracteolatis, lobis perigonii exterioribus oblongis acutiusculis, interioribus paulo minoribus, staminibus liberis, antheris apertis subobovato-oblongis obtusis filamento triplo brevioribus, baccis globosis.—*S. lancæfolia*, Roxb. Fl. Ind. vol. iii. p. 792.—*S. oxyphylla*, Wall. Cat. n. 5128!—Kth. Enum. vol. v. p. 238, excl. syn.! Trailing over shrubs (Champion! Hance!); Khassiya Hills (Griffith!).

A scandent shrub, resembling *S. glabra*, Roxb., but differing in being sometimes aculeate, and not having glaucous foliage and fruit, sessile anthers, etc.

Plate XCIX. Fig. 1, a male flower, not open; 2, male flower, open; 3, a stamen; 4, a branch, with ripe fruit; 5, a single ripe fruit; 6 and 7, sections of ditto:—*all*, with exception of fig. 4, magnified.

632. Smilax *glabra*, Roxb. (Tab. C.); inermis, caule ramisque teretibus lævibus, foliis lanceolatis vel ovato-lanceolatis acuminatis basi attenuatis vel rotundatis 3–5-nerviis subtus glaucescentibus, umbellis axillaribus simplicibus breviter pedunculatis vel sessilibus solitariis, gemmis floriferis trilobis, perigonii foliolis exterioribus obcordatis, interioribus subrotundatis denticulatis, antheris cordatis sessilibus, baccis obovato-oblongis vel globosis glaucis.—*S. glabra*, Roxb. Fl. Ind. vol. iii. p. 793. Trailing over shrubs (Hinds! Champion! Hance! Seemann!); also gathered by Millet; Silhet (Wallich!).

A scandent, unarmed shrub. Leaves, including petiole, from 3–5 inches long, and from $\frac{1}{2}$–$1\frac{1}{2}$ inch broad, easily distinguished from the other species by its glaucous foliage and fruit.

Plate C. Fig. 1, an entire male flower, not quite open; 2, the same, open; 3, one of the inner sepals; 4 and 5, anthers; 6, branch, with ripe fruit; 7, young fruit; 8 and 9, sections of ditto; 10, ripe fruit; 11, 12, 13, different views of seed; 14, seed, cut open; 15, embryo:—*all*, with exception of fig. 6, *magnified*.

633. Smilax *Hongkongensis*, Seem.; inermis, glabra, ramis striatis, ramulis subangulatis, foliis cordatis vel ovatis acuminatis mucronatis, umbellis axillaribus solitariis vel geminis, perigonii foliolis

erectis connatis, staminibus 3, monadelphis, antheris cordatis acuminatis, baccis subtrilobis, 3-spermis. Trailing over shrubs (Hance! Seemann!).

There are unfortunately no female flowers of this species, remarkable for its connated perigonial leaves and monadelphous stamens.

634. Smilax *ovalifolia*, Roxb. Fl. Ind. vol. iii. p. 794.—*S. macrophylla*, Roxb. l. c.!—*S. prolifera*, Roxb. l. c.! Trailing over shrubs (Hance!).

This species has generally paniculate, but sometimes also simple umbels. It is widely distributed over tropical Asia. In Herb. Hook. there are specimens from Rangoon (M'Clelland!), Ceylon (Walker! Gardner!), Kumaon (Strachey and Winterbottom!), Silhet (Wallich!).

Smilax Pseudo-China, Linn., was said to have been collected in China (Bot. Beech. p. 218), but it appears that some North American specimens of that plant were inadvertently mixed up with a Chinese collection; if this explanation suffices with regard to the statement in Bot. Beech., we have still to find out what Roxburgh and Loureiro understand by their respective *S. Pseudo-China*.

LILIACEÆ.

635. Lilium *longiflorum*, Thunb., Kth. Enum. vol. iv. p. 267. Summits of the hills among grass (Champion! Hance!).

A yellow-flowered variety is said to grow on Mount Parker.

636. Barnardia *scilloides*, Lindl., Kth. Enum. vol. iv. p. 337. In ravines near Chuckchew (Champion!); also collected on Lippas Island, near Macao (Vachell!), and by Fortune, n. 144.

637. Dianella *ensifolia*, Redouté, Kth. Enum. vol. v. p. 50. In ravines of various parts of the Island (Hance! Champion!).

638. Asparagus *falcatus*, Linn., Kth. Enum. vol. v. p. 71.—*Melanthium Cochinchinense*, Lour., teste cl. Hance. In various parts of the Island, common (Hance! Champion!).

Polianthes tuberosa, L., *Allium fistulosum*, L., *Agapanthus umbellatus*, L'Hérit., *Dracæna ferrea*, Linn., etc., are cultivated in the gardens.

PHYLLYDREÆ.

639. Philydrum *lanuginosum*, Banks, Kth. Enum. vol. iii. p. 380. Marshes at Saiwan (Hance! Champion!); also found in the Philippine Islands (Cuming, 2345!), at Port Curtis, Australia (M'Gillivray!), and at Sydney (Herb. Hook.!).

COMMELYNEÆ.

640. Commelyna *communis*, Linn., Kth. Enum. vol. iv. p. 36. In waste places, roadsides, etc. (Hance!).

641. Commelyna *Bengalensis*, Linn., Kth. Enum. vol. iv. p. 50. In waste places (Hance!).

ALISMACEÆ.—Sagittaria *Chinensis*, Sims in Bot. Mag. t. 1631.—Kth. Enum. vol. iii. p. 157, is cultivated about Canton. I was only enabled to gather a solitary leaf of it, which however exactly agrees with the figure in the 'Botanical Magazine.'

642. Anilema *didymum*, Hamilt., Wall. Cat. n. 5202. Hongkong (Hance!).

643. Cyanosis *axillaris*, Rœm. et Schult., Kth. Enum. vol. iv. p. 105. In waste places (Hance!).

Tradescantia discolor, Smith, is cultivated in the gardens.

XYRIDEÆ.

644. Xyris *pauciflora*, Willd., Kth. Enum. vol. iv. p. 17. In swamps (Hance!).

Mentioned as *Xyris Indica* at p. 356.

ERIOCAULEÆ.

645. Eriocaulon *Wallichianum*, Mart. in Wall. Pl. Rar. vol. iii. p. 26. t. 249.—*E. Cantoniense*, Hook. et Arn. Bot. Beech. p. 219! In marshes, at Saiwan and elsewhere (Hance! Champion!).

Hooker and Arnott's name is overlooked in Körnicke's recent revision of the genus *Eriocaulon*, in the twenty-seventh volume of the 'Linnæa.'

CYPERACEÆ.

(*Auctore Munro.*)

646. Cyperus *polystachyus*, Rottb. Hongkong (Hance!).

647. Cyperus *Haspan*, Linn. Hongkong (Hance!).

648. Cyperus *Iria*, Linn. Hongkong (Hance! Seemann!).

649. Cyperus *canescens*, Vahl. Hongkong (Hance!).

650. Mariscus *cyperinus*, Vahl. Hongkong (Hance!).

651. Kyllingia *monocephala*, Linn. Hongkong (Hance!).

652. Lipocarpha *argentea*, R. Brown.—*L. lævigata*, Nees ab Esenb. Hongkong (Hance!).

653. Fuirena *umbellata*, Rottb. Hongkong (Hance!).

654. Isolepis *barbata*, R. Brown. Hongkong (Hance!).

655. Fimbristylis *acuminata*, Vahl. Hongkong (Hance!).

656. Fimbristylis *podocarpa*, Nees ab Esenb. Hongkong (Hance!).

657. Fimbristylis *communis*, Kunth. Hongkong (Hance!).

658. Fimbristylis *quinquangularis*, Nees ab Esenb. Hongkong (Hance!).

659. Fimbristylis *junciformis*, Nees ab Esenb. Hongkong (Hance!).

660. Fimbristylis *complanata*, Nees ab Esenb. Hongkong (Hance!).

661. Lepidosperma *Chinense*, Nees et Meyen. Hongkong (Hance! Seemann!).

662. Cladium *Chinense*, Nees ab Esenb. Hongkong (Hance!).

663. Rhynchospora *laxa*, R. Brown. Hongkong (Hance!).

664. Scleria *hibecarpa,* Nees ab Esenb. Hongkong (Hance!).

665. Scleria *scrobiculata,* Nees ab Esenb. Hongkong (Hance!).

666. Scirpus *Chinensis,* Munro (sp. nov.); culmo 3-gono foliato glabro, foliis planis carina margineque scabris, umbella supradecomposita cymæformi involucro 3–5-phyllo longissimo umbellam multo superante, spicis 2–pluribus congestis omnibus sessilibus multifloris, squamis convexis fuscis striatis obtusis muticis lineolis sanguineis notatis, stylo 2-fido, achænio (immaturo) biconvexo, stamina 3 setis 3 staminibus alternantibus retrorsum scabris achænium non laxe superantibus. Proximus *Scirpo sylvestri,* sed laxe differt stylo involucro setisque. Hongkong (Hance!).

667. Carex *Chinensis,* Retz. Hongkong (Hance!).

668. Carex *Indica,* Linn. Hongkong (Hance!).

GRAMINEÆ.

(*Auctore Munro.*)

669. Oryza *sativa,* Linn.—"Rice" of the colonists. Extensively cultivated in Hongkong and the neighbourhood.

670. Alopecurus *geniculatus,* Linn. Hongkong (Hance!).

671. Paspalum *scrobiculatum,* Linn. Hongkong (Hance! Seemann!).

672. Paspalum *Chinense,* Nees ab Esenb.—*Panicum lineare,* Linn. Hongkong (Hance!).

673. Panicum *sanguinale,* Linn., var. *commutatum,* Nees ab Esenb. Hongkong (Hance!).

674. Panicum *colonum,* Linn. Hongkong (Hance!).

675. Panicum *ischæmoides,* Retz. Hongkong (Hance!).

676. Panicum *angustum,* Trin. Hongkong (Hance!).

677. Setaria *Statice,* Kunth. Hongkong (Hance!).

678. Setaria *glauca,* P. de B., var. *penicillata.* Hongkong (Hance! Seemann!); also collected at Shanghai (C. F. Tonnerre!).

679. Gymnothrix *Japonica,* Kunth; an etiam *G. Thouarii,* P. de B.? Hongkong (Hance!).

680. Isachne *miliacea,* Roth.—*I. muricata,* Nees ab Esenb., forma glabrior. Hongkong (Hance!).

681. Thouarea *sarmentosa,* Pers. In the sand of the sea-beach (Hance!).

682. Spinifex *squarrosa,* Linn. Sand of the sea-beach (Hance!).

683. Thysanoæna *acarifera,* Nees ab Esenb. Hongkong (Hance!).

684. Arundinella *miliacea,* Link. Hongkong (Hance!).

685. Arundo *Madagascariensis,* Kunth. Hongkong (Hance! Seemann!).

686. Sporobolus *elongatus*, R. Brown.—*S. diandrus*, P. de B. Hongkong (Hance! Seemann!).

687. Phragmites *Roxburghii*, Kunth. Hongkong (Hance!).

688. Cynodon *dactylon*, Pers. On roadsides (Hance! Seemann!).

689. Chloris *barbata*, Sw. Hongkong (Hance!); also at Macao (Hance!).

690. Eleusine *Indica*, Gærtn. Hongkong (Hance!); also at Dane's Island (Hance!).

691. Eragrostis *unioloides*, Retz.—*E. amabilis*, Hook. et Arn., non Linn. Hongkong (Hance!).

692. Eragrostis *Zeylanica*, Nees ab Esenb. Hongkong (Hance!).

693. Eragrostis *orientalis*, Trin. Hongkong (Hance!).

694. Eragrostis *verticillata*, P. de B. Hongkong (Hance!).

695. Eragrostis *plumosa*, Linn. Hongkong (Hance!).

696. Schizostachyum *dumetorum*, Munro, mss.—*Bambusa dumetorum*, Hance in Wlprs. Ann. vol. iii. p. 781! In woods (Hance!).

697. Hordeum *hexastichum*, Linn. Cultivated in the Island.

"All sprung from a single seed introduced."—*Hance, mss.*

698. Hemanthria *fasciculata*, Kunth. Hongkong (Hance!).

699. Zoysia *pungens*, Willd. Hongkong (Hance!).

700. Pogonatherum *refractum*, Nees ab Esenb. Hongkong (Hance!).

701. Imperata *Kœnigii*, P. de B. Hongkong (Hance!).

702. Erianthus *tristachys*, Nees ab Esenb. Hongkong (Hance!).

703. Eulalia *densa*, Munro.—*Saccharum densum*, Nees ab Esenb.! Hongkong (Hance!).

704. Heteropogon *Roxburghii*, Wight et Arn. Hongkong (Hance!).

705. Andropogon *Martini*, Roxb. Hongkong (Hance!).

706. Chrysopogon *aciculatus*, Trin.—*C. trivialis*, Nees ab Esenb.! Hongkong (Hance!).

707. Sorghum *tropicum*, Nees ab Esenb. Hongkong (Hance!).

708. Meoschium *Meyenianum*, Nees ab Esenb. Hongkong (Hance!).

709. Ischæmum *leersioides*, Munro, mss. (n. sp.). Hongkong (Hance!).

Another new species of this genus (*I. cinerascens*, Munro) was collected by Mr. C. F. Tonnerre at Shanghai.

Bambusa Arundo, Hb. Klein., and *Zea Mays*, Linn., are cultivated in the Island.

FILICES.

(*Auctore J. Smith.*)

Polypodiaceæ, *R. Br.*

Tribe I. Polypodieæ, *J. Sm.*

710. Phegopteris *rugulosa,* Fée, Gen. Fil. p. 243.—*Polypodium rugulosum,* Labill. Nov. Holl. vol. ii. t. 241. Hongkong (Hance! Seemann!).—v. v. Hort. Kew.

711. Phegopteris *trichodes,* J. Sm.—*Polypodium trichodes,* J. Sm. in Hook. Journ. Bot. vol. iii. p. 394 (exclus. syn. Reinw.). Hongkong (Hance! Seemann!).—v. v. Hort. Kew.

On comparing a numerous suite of herbarium specimens of this and the preceding species, and also *Phegopteris ornata* of India, it becomes difficult to separate them as distinct species; their modes of vernation however differ, the fronds of *P. rugulosa* being distantly produced (the axis being an elongating sarmentum), whereas in *P. trichodes* they are produced in a fascicle, constituting a decumbent corm.

712. Meniscium *simplex,* Hook. Lond. Journ. Bot. vol. i. p. 294. t. 11. Hongkong (Hance! Seemann!).—v. v. Hort. Kew.

Cultivated plants of this species often produce contracted fertile fronds, with the whole under side sporangiferous, agreeing in character with the Tribe *Acrostichæ,* thus showing that the character of the sori is not alone sufficient for determining the limits of genera. If the first observed specimens of this species had happened to be the state with contracted fronds, it would no doubt have been referred to the Acrostichoid genus *Pœcilopteris,* the natural ally of *Meniscium.*

713. Phymatodes *nuda,* J. Sm.—*Pleopeltis nuda,* Hook. Ex. Fl. t. 63 (non Hook. Gen. Fil.).—*Drynaria Fortunei,* T. Moore, Gard. Chron. vol. for 1855, p. 708, non Kunze. Hongkong, Shanghai (Fortune! Tonnerre!).—v. v. Hort. Kew.

714. Phymatodes *excavata,* J. Sm.—*Polypodium excavatum,* Bory, Willd. l. c. p. 158.—*Pleopeltis nuda,* Hook. Gen. Fil. t. 18 (non Ex. Flora). Hongkong (Hance!); Macao.

715. Phymatodes *irioides,* Presl.—*Polypodium irioides,* Poir., Willd. l. c. p. 160. Hook. et Grev. Ic. Fil. t. 125.—*Polypodium polycephalum,* Wall. Scull Island (Hance!).—v. v. Hort. Kew.

Common throughout the tropical and subtropical regions of the eastern hemisphere; also found in the Island of Trinidad.

716. Niphobolus *adnascens,* Kaulf. En. Fil. p. 124.—*Polypodium adnascens,* Sw.—*Polypodium spissum,* Bory.—*Polypodium pertusum,* Roxb., Hook. et Grev. Ic. Fil. t. 162.—*Polypodium vittarioides,* Wall. Hongkong (Hance! Seemann!).—v. v. Hort. Kew. East Indies and Malayan Archipelago; common.

717. Niphobolus *lingua,* Spreng. Syst. vol. iv. p. 45.—*Acrostichum lingua,* Thunb. Fl. Jap. t. 33.—*Polypodium lingua,* Sw., Lang. et Fisch. Ic. Fil. t. 5. East Indies and China (Hance!).—v. v. Hort. Kew.

718. Drynaria *Fortunei,* Kunze, Mett. Monog. Polypodium, p. 121. t. 3. Foo-chow-foo (Fortune! Tonnerre!).

In habit and general aspect this species resembles *Drynaria quercifolia,* but differs in having only one

row of sori between the primary veins, in which respect it agrees with *Drynaria coronans* of India; but *D. Fortunei* is distinguished from the latter as well as from *D. quercifolia* by having the margin of the laciniæ minutely notched at equal distances.

719. Ceratopteris *thalictroides*, Brongn. Hongkong (Seemann!). Very general throughout the tropics and subtropics of both hemispheres.—v. v. Hort. Kew.

Tribe Acrosticheæ, *J. Sm, l. c.*

720. Pœcilopteris *heteroclita*, Presl.—*Acrostichum heteroclitum*, Presl, Reliq. Hænk. p. 15. t. 2. f. 2. Hongkong (Hance!).

721. Pœcilopteris *repanda*, J. Sm.—*Acrostichum repandum*, Blume, En. Fil. Jav. p. 104.—Fl. Jav. t. 14, 15. Hongkong (Hance!).—v. v. Hort. Kew.

Tribe Pterideæ, *J. Sm. l. c.*

722. Notholæna *sulcata*, Link, Hort. Berol. vol. ii. p. 367.--Kunze, Fil. t. 3.—*N. densa*, J. Sm. En. Fil. Philipp. l. c. p. 395.—*N. pilosa*, Hook. et Arn. in Beech. Voy. Hongkong.

723. Cheilanthes *tenuifolia*, Sw., Syn. Fil. p. 129.—Schk. Fil. t. 125.—Hook. Sp. Fil. vol. ii. p. 82. Hongkong (Hance! Seemann!); East Indies; Malay Archipelago.

724. Onychium *Japonicum*, Kunze, in Schk. Fil. Supp. p. 11.—Hook. Sp. Fil. vol. ii. p. 122.—*Trichomanes Japonicum*, Thunb. Fl. Jap. p. 340. Foo-chow-foo (Tonnerre!).

725. Adiantum *caudatum*, Linn., Hook. Sp. Fil. vol. ii. p. 13.—Schk. Fil. t. 17. Hongkong (Hance!); East India.—v. v. Hort. Kew.

726. Adiantum *lunulatum*, Burm., Hook. Sp. Fil. vol. ii. p. 11.—Hook. et Grev. Ic. Fil. t. 104. Dane's Island (Hance!), East Indies.

727. Adiantum *flabellulatum*, Linn., Hook. Sp. Fil. vol. ii. p. 30.—*A. amœnum*, Wall. Hongkong (Seemann!).

728. Pteris *longifolia*, Linn., Willd. l. c. p. 369.—Schk. Fil. t. 88.—Agard. Monog. Pteridis, p. 1. Hongkong (Hance! Seemann!).

This species ranges throughout the tropics and subtropics of both hemispheres, extending in latitude from the Cape of Good Hope to the shores of the Mediterranean, flourishing under great diversity of climate, both as regards temperature and moisture. In the island of Ischia it grows in company with *Cyperus polystachys*, within the influence of the hot vapour issuing from the steam-holes of the extinct volcano, in soil at a temperature of from 140° to 167° Fahr. In a state of cultivation its spores vegetate in such profusion as to become a pest in hothouses. It is common in the West India Islands, and is found in Mexico, but, with the exception of Venezuela, it has not been found in any other part of South America.

729. Pteris *Cretica*, Linn., Willd. l. c. p. 374.—Agard. Monog. Pteridis, p. 8.—Schk. Fil. t. 90. Shanghai (Fortune! Tonnerre!).—v. v. Hort. Kew.

This has probably a wider geographical distribution than the preceding species. The fronds vary much in size, and in the pinnæ being variously divided, which has given rise to several of the states having been described as distinct species.

730. Pteris *crenata*, Sw., Willd. l. c., p. 373.—Agard. l. c. p. 14.—(Burm. Fl. Zey. t. 87.) Hongkong (Hance!).—v. v. Hort. Kew.

731. Pteris *semipinnata*, Linn., Willd. l. c. p. 388.—Agard. l. c. p. 17.—*P. dimidiata*, Willd. l. c. p. 381.—*N. flabellata*, Schk. Fil. t. 93. Hongkong (Fortune! Seemann! Hance!).—v. v. Hort. Kew.

732. Pteris *nemoralis*, Willd. l. c. p. 386.—Agard. l. c. p. 25. Hongkong (Seemann!).

733. Pteris *aquilina*, Linn. supra, p. 342. Hongkong (Seemann!).

734. Blechnum *orientale*, Linn., Willd. l. c. p. 414.—Schk. Fil. t. 109. Hongkong (Seemann!).—v. v. Hort. Kew.

735. Brainea *insignis*, J. Sm.—*Bowringia insignis*, Hook. in Journ. Bot. and Kew Misc. vol. v. p. 237. t. 2. Hongkong (Hance! Seemann!), Khasia (Hook. fil. and Thomson).—v. v. Hort. Kew.

This remarkable Fern has been described and figured by Sir W. J. Hooker, under the name of *Bowringia*, but as that name happens to be already applied to a genus of *Leguminosæ* by Mr. Bentham, I adopt the name *Brainea* in compliment to C. Braine, Esq., who, on his return from Hongkong in 1851, introduced the living plants now found in the Royal Gardens at Kew.—With regard to the position *Brainea* occupies in a natural sequence, its general habit and character of the sporangiferous receptacle appears to indicate its relationship with *Lomaria*, especially with *L. Boryana* of Willdenow, as also with *Sadleria cyathioides* of Kaulfuss. *Brainea* agrees with them in having a stout, *Zamia*-like caudex, rising to the height of 2–5 feet, but its venation is anastomosed, and the sporangia are destitute of an indusium. The sporangia being produced on transverse anastomosing costal veins, seems to indicate some affinity with *Woodwardia* and *Doodia*, but the absence of the indusium, and its arboreous habit, shows it to be distinct from those two genera. *Sadleria* has bipinnatifid fronds, whereas in *Brainea* they are simply pinnate, as generally observed; but such does not appear to be the normal character, for a plant under my notice has produced bipinnatifid, and even complete bipinnate fronds. On taking all these points into consideration, I am induced to place *Brainea* in the *Blechneæ* alliance, even though it has no indusium.

736. Neottopteris *Nidus*, J. Sm., supra, p. 342. On trees; Hongkong (Hance! Seemann!).

Representatives of this genus are found throughout the tropics, extending from Western Africa eastward through India, the Malayan Archipelago, the Sandwich and Friendly Islands, and, in one or two localities, on the Pacific side of America; but it has not been observed in the great Fern regions of tropical America or the West Indies. In southern latitudes it extends to Norfolk Island, and the southern parts of the east coast of Australia. Many localities possess forms peculiar to them, and although great similarity pervades the whole, yet some seem sufficiently specifically distinct. Fée, in his 'Genera Filicum,' enumerates thirteen species; the chief distinctions consist in the fronds varying in being linear-lanceolate or broad-elliptical, sessile or stipitate, and in the costa being prominently acute or obtuse-convex. In cultivated plants under my notice, these differences are obvious, and it appears to me that the acute costa of the Australian type of *N. Nidus* is characteristic of its being a distinct species from the Indian type, in which the costa is merely convex, but in extensive suites of herbarium specimens the differences seen in the living plants are not so evident, and then it becomes difficult to separate them as distinct species.

737. Asplenium *lanceum*, Thunb. Fl. Jap. p. 333.—Willd. l. c. p. 303.—*Diplazium lanceum*, Presl.—*Scolopendrium dubium*, Don.—*Asplenium subsinuatum*, Hook. et Grev. Ic. Fil. t. 27. Hongkong (Hance! Seemann!); East Indies.

This is a very distinct species, being one of a few *Aspleniæ* that have sarmentose vernation. It varies

however so much in the technical character of the sori, that, as shown by its synonyms, it has been placed by the respective authors under different genera; sori agreeing with the technical character of each of the three genera being found on the same frond, or on different fronds of the same plant. This and many other examples of sori characteristic of these genera being often produced on the same plant, shows that the binate sori of *Diplazium*, and the opposite coalescing sori of *Scolopendrium*, are scarcely tenable as generic distinctions; and there being no natural character to assist in defining *Scolopendrium* and *Diplazium* as distinct from *Asplenium*, it appears to me that the whole may with propriety be viewed as forming but one extensive natural genus, consisting of groups of species, more readily distinguished by their different phases than by any characters derived from the sori.

738. Asplenium *thelypteroides*, Mich., Schk. Fil. t. 76 b.—Willd. l. c. p. 337.—*Diplazium thelypteroides*, Presl. Hongkong.—v. v. Hort. Kew.

739. Asplenium *fontanum*, R. Br.—*Aspidium fontanum*, Sw., Schk. Fil. t. 53.—Willd. l. c. p. 272. Hongkong (Seemann!); Shanghai (Tonnerre!).—v. v. Hort. Kew.

If we restrict *Asplenium fontanum* to its European type, then the present specimens may have some right to be considered a distinct species; but intermediate forms being found in the Himalayan and other regions, renders it impossible to view the whole otherwise than as one species.

740. Asplenium *laserpitifolium*, Lam., Willd. l. c. p. 347. Hongkong (Hance! Seemann!).—v. v. Hort. Kew.

741. Diplazium *sylvaticum*, Sw., Willd. l. c. p. 352.—Schk. Fil. t. 85 b.—*Callipteris sylvatica*, Bory.—*Asplenium latifolium*, D. Don.—*Asplenium maximum*, D. Don.—*Asplenium diversifolium*, Wall. Hongkong.

742. Diplazium *fraxinifolium*, Wall. Cat. n. 194, non D. Don. Hongkong (Hance!).

Tribe Aspidieæ.

743. Aspidium *intermedium*, J. Sm.—*Sagenia intermedia*, J. Sm. En. Fil. Philipp. l. c. p. 410. Hongkong (Hance! Seemann!).

This plant belongs to a grade consisting of *Aspidium cicutarium*, Sw., from the West Indies, *A. sinuatum*, Gaud., of the islands of the Pacific, and *A. coadunatum*, Wall., from India. These being described by their respective authors as distinct species, and coming from different countries, may be viewed as good evidence that they are truly distinct species, and which is further confirmed by the different appearance of cultivated plants originally received from the three localities above mentioned, but on collating the numerous specimens in the Hookerian and my own herbarium, it becomes difficult to separate them as distinct species.

744. Cyrtomium *falcatum*, Presl, Pterid. p. 86.—*Polypodium falcatum*, Linn., Thunb. Fl. Jap. p. 336. t. 35. Hongkong; Shanghai (Tonnerre).—v. v. Hort. Kew.

745. Nephrodium *granulosum*, J. Sm.—*Polypodium granulosum*, Presl, Reliq. Hænk. p. 21. t. 4. f. 2.—*Aspidium glandulosum*, Blume, En. Fil. Jav. p. 144. Hongkong (Hance!).

746. Nephrodium *molle*, Schott, Gen. Fil. t. 22.—Presl, Pterid. p. 81.—*Aspidium molle*, Sw., Schk. Fil. t. 34 b.—Willd. l. c. p. 244. Hongkong (Hance! Seemann!); throughout the tropics generally.—v. v. Hort. Kew.

747. Lastrea *podophylla*, J. Sm.—*Aspidium* (Lastrea) *podophyllum*, Hook. in Journ. Bot. and Kew Misc. vol. v. p. 236. t. 1.—*Aspidium Sieboldi*, Van Houtte, Cat., Mett. Fil. Hort. Lips. t. 20. f. 1–4.—*Pycnopteris Sieboldi*, T. Moore. Hongkong; Japan.—v. v. Hort. Kew.

The genus *Lastrea*, as characterized by Presl, contains a very heterogeneous mass of species, all agreeing in having punctiform sori, seated on or below the apex of free veins, and furnished with a reniform indusium, the latter character distinguishing *Lastrea* from another extensive group (*Polystichum*), the typical species of which have an orbicular indusium, and are also known by their fronds being more coriaceous, rigid, and spinose than in *Lastrea;* unfortunately for the value of these characters, there are species possessing the general character of the fronds of *Polystichum*, but with reniform indusia, hence the form of the indusium proves of little value as a character whereby to distinguish *Lastrea* from *Polystichum;* indeed the limits of the two genera cannot readily be defined; the numerous species are however capable of being arranged in natural sections, characterized by their modes of vernation and other points of difference, which some authors have considered of sufficient importance to constitute several new genera, the present species being typical of one, but which I do not adopt. Its nearest affinity is with *Lastrea atrata*, J. Sm. (*Aspidium atratum*, Wall.), and belongs to the sequence containing *Lastrea Filix-mas*.

748. Lastrea *opaca*, Hook. mss. Hongkong (Hance! Seemann!); Shanghai (Tonnerre!); Macao (Vachel!).

749. Lastrea *decurrens*, J. Sm. En. Fil. Hort. Kew. 1846.—*Aspidium decursive-pinnatum*, Kunze. China (Herb. Lambert. 1834, J. Sm.)—v. v. Hort. Kew.

750. Nephrolepis *tuberosa*, Presl, Pterid. p. 79.—*Aspidium tuberosum*, Bory, Willd. l. c. p. 234.—*Nephrodium edule*, Don. Hongkong (Hance! Seemann!); East Indies.—v. v. Hort. Kew.

751. Nephrolepis *hirsutula*, Presl, l. c. p. 79.—*Aspidium hirsutulum*, Sw., Willd. l. c. p. 232.—Schk. Fil. t. 33. Hongkong (Hance! Seemann!); East Indies.—v. v. Hort. Kew.

Tribe Dicksonieæ, *J. Sm. l. c.*

§ *LINDSÆÆ.*

752. Schizoloma *ensifolium*, J. Sm. En. Fil. Philipp. l. c. p. 414.—*Lindsæa ensifolia*, Hook. Sp. Fil. vol. i. p. 220.—Hook. et Grev. Ic. Fil. t. 3. Hongkong (Hance!); Malayan Archipelago; Australia; East Indies.—v. v. Hort. Kew.

753. Schizoloma *heterophyllum*, J. Sm. l. c. p. 414.—*Lindsæa heterophylla*, Dry., Trans. Linn. Soc. vol. iii. t. 8. f. 1.—Hook. Sp. Fil. vol. i. p. 223. Hongkong (Hance! Seemann!); Malayan Archipelago.

The pinnæ of this species vary much in form, and in the venation being free or anastomosing, thus showing that the technical characters of *Lindsæa* and *Schizoloma*, observed in their typical species, are not constant.

754. Lindsæa *flabellulata*, Dry. l. c. t. 8. f. 2.—Hook. Sp. Fil. vol. i. p. 211. Hongkong (Hance! Seemann!).

755. Odontosoria *tenuifolia*, J. Sm.—*Davallia* (§ Odontosoria) *tenuifolia*, Presl, Pterid. p. 129. *Davallia tenuifolia*, Sm., Hook. Sp. Fil. vol. i. p. 186.—*Stenoloma tenuifolia*, Fée. Hongkong (Hance! Seemann!); very general throughout the tropics of the Eastern hemisphere, and in Brazil.—v. v. Hort. Kew.

In conformity with my views of the affinities of Ferns, as founded on their different modes of vernation, described at page 226 of this Work, it becomes necessary to separate this and the following species from true *Davallia*, the latter genus being now restricted to the species having a fleshy squamose rhizome, with articulate vernation, agreeing with the division *Eremobrya*. In *Odontosoria* the vernation is fasciculate and adherent, consequently belongs to the division named *Desmobrya*. In *Odontosoria retusa* the sporangiferous receptacle is often continued across the apex of 2–4 venules, consequently assuming the character of *Lindsæa*, with which the present genus is naturally allied.

756. Odontosoria *Chinensis*, J. Sm.—*Davallia* (§ Odontosoria) *Chinensis*, Presl, l. c.—*Davallia Chinensis*, Sw., Hook. Sp. Fil. p. 187.—*Trichomanes Chinensis*, Linn. Hongkong.

§ *DAVALLIÆ*, J. Sm.

757. Davallia *divaricata*, Blume, En. Fil. Jav. p. 237.—*D. polyantha*, Hook. Sp. Fil. vol. i. p. 147. t. 59 A. Hongkong (Hance!).—v. v. Hort. Kew.

758. Microlepia *polypodioides*, Presl, Pterid. p. 125.—*Dicksonia polypodioides*, Sm., Willd. l. c. p. 487.—*Davallia polypodioides*, Hook. Sp. Fil. vol. i. p. 181. Hongkong, and throughout the tropics generally (Hance! Seemann!).

The numerous and various climatic influences under which this species grows, appears to cause it to assume different phases, the extreme states having the appearance of being distinct species; but the many intermediate states, and our want of knowledge of the nature of their rhizomes, renders it impossible to arrive at any other conclusion than that the great mass of examples in our herbariums belong to one species only.

§ *DICKSONIEÆ*.

759. Cibotium *Barometz*, J. Sm. Gen. Fil. l. c.—*C. glaucescens*, Kunze, in Schk. Fil. Suppl. p. 73. t. 31.—Hook. Sp. Fil. vol. i. p. 83.—Conf. Hasskarl's *Retzia*. Hongkong (Hance! Seemann!); Shanghai (Fortune).

Although this Fern has been long known in a cultivated state in the Botanic Gardens of this country, yet it is only recently that herbarium specimens of it have been received from China, and which agree with the living plants in the Royal Gardens at Kew, the origin of which were sent from Canton by the late John Reeves, Esq., as the plant on which the story of the fabulous Barometz was founded.—(Conf. Pharmaceutical Journal, vol. xvi. p. 278.)

Tribe Cyatheæ, *Gaud., J. Sm.*

760. Alsophila *gigantea*, Presl, Pterid. p. 61.—Hook, Sp. Fil. vol. i. p. 32.—*Polypodium giganteum*, Wall.—*Gymnosphora gigantea*, J. Sm. Gen. Fil. p. 114.—*Alsophila cernua*, Hook. l. c. p. 53. t. 20.—*Polypodium cernua*, Wall.

In the present specimens the pinnules are more entire than in the Indian types, the venules also occasionally anastomose, nevertheless I cannot think it is a different species.

Gleicheniaceæ, *R. Br.*

761. Mertensia *dichotoma*, Willd. l. c. p. 70.—Schk. Fil. t. 148.—J. Sm. Gen. Fil. l. c.—*Gleichenia dichotoma*, Hook. Sp. Fil. p. 12.—*Polypodium dichotomum*, Thunb. Fl. Jap. t. 37. Hongkong (Hance! Seemann!). Very general throughout the tropics of the Old and New World.

762. Mertensia *glauca,* Sw., Willd. l. c. p. 75.—*Gleichenia glauca,* Hook. Sp. Fil. p. 4. t. 3 B. Hongkong (Seemann !).

Schizæaceæ, *Mart.*

763. Lygodium *flexuosum,* Sw., Willd. l. c. p. 83 (sub *Hydroglossum*).—*L. dichotomum,* Sw., Hook. et Grev. Ic. Fil. t. 55. Hongkong (Hance !) ; Malayan Archipelago.

764. Lygodium *scandens,* Sw., Willd. l. c. p. 77.—Schk. Fil. t. 138. Hongkong (Hance !) ; tropics of the eastern hemisphere.

765. Lygodium *Japonicum,* Sw., Willd. l. c. p. 81. Hongkong (Hance ! Seemann !) ; East Indies ; Malayan and other islands of the eastern hemisphere.—v. v. Hort. Kew.

766. Lygodium *microphyllum,* R. Br. Prodr.—Fl. Nov. Holl. p. 142. Hongkong (Hance !) ; islands of the Pacific.

The protean forms assumed by the species of this genus, renders any attempt to define their specific distinction a task which, with all the time that can be bestowed on their examination, ends in no satisfactory result. Fifteen species are described by Willdenow ; Presl has no fewer than forty, and if his data for characterizing species are adopted, the number may can be increased.

Osmundaceæ, *Mart.*

767. Osmunda *Javanica,* Blume, En. Fil. Jav. p. 252.—J. Sm. Gen. Fil. l. c.—*O. Vachellii,* Hook. Ic. Pl. t. 15. Hongkong (Hance ! Seemann !) ; India ; Java ; Luzon.

Marattiaceæ, *Kaulf.*

768. Angiopteris *evecta,* Hoff., Willd. l. c. p. 69.—Schk. Fil. t. 150.—Hook. et Grev. Ic. Fil. t. 36. Hongkong (Hance ! Seemann !) ; general throughout the Malayan and Polynesian Islands.

LYCOPODIACEÆ.

(*Auctore J. Smith.*)

769. Selaginella *concinna,* Spring, Monog. Lycop. p. 199.—*Lycopodium concinnum,* Sw. In woods (Hance !).

770. Selaginella *argentea,* Spring, l. c. p. 154.—*Lycopodium argenteum,* Wall. Cat. n. 127. In woods (Hance !).

771. Selaginella *atroviridis,* Spring, l. c. p. 124.—*Lycopodium atroviride,* Wall. Cat. n. 120. —Hook. et Grev. Ic. Fil. t. 39. In woods (Hance !).

772. Selaginella *flabellata,* Spring, l. c. p. 115.—*Lycopodium flabellatum,* Linn. In woods (Hance !).

773. Lycopodium *cernuum,* Linn., Spring, l. c. p. 79. In woods (Hance !). Very general throughout the tropics and subtropics of both hemispheres.

MUSCI.

774. Trematodon *longicollis*, Wils. in Lond. Journ. Bot. vol. vii. p. 273. On a granite rock near the Canton Bazaar (T. Anderson, fide Wilson).

775. Hypnum *microcarpum*, Hook., var., Wils. in Lond. Journ. Bot. vol. vii. p. 277. Moist upland ground (T. Anderson, fide Wilson).

The following Mosses were collected by T. Anderson on the little peninsula of Cowlung, opposite Hongkong, and probably also occur in the Island itself:—*Physcomitrium acuminatum*, Br. et Schimp., *Trichostomum nobilis*, Griff., *Didymodon proscriptus*, Hornsch.?, *Neckeria dendroides*, Wils., *Hypnum microphyllum*, Swartz. Conf. Wils. in Lond. Journ. vol. vii. p. 273.

LICHENES.

(*Auctore Churchill Babington.*)

776. Ramalina *linearis*, Ach. Lich. Univ. p. 598, et Auctt.—Swartz, Lich. Amer. t. 11. Hongkong; fertile (Hance! Seemann!).

Probably a mere form of the common *R. calicaris*. Widely diffused over the warmer parts of the world.

777. Parmelia *perlata*, Ach. Meth. Lich. p. 216, et Auctt. Hongkong; barren (Hance! Seemann!).

Fragments resembling the European form (with pulverulent edges) mixed with the foregoing; but large-lobed isidiophorous specimens have also been collected, belonging to a common tropical state of the plant (= *P. saccatiloba*, Tayl.!).

778. Parmelia *speciosa*, Ach. Meth. Lich. p. 198, et Auctt. Hongkong; barren (Hance! Seemann!).

ADDENDA ET CORRIGENDA.

Rhodoleia *Championi*, Hook. Miquel has published, in Verslagen en Mededeel. der K. Akademie van Wetenschappen, Afd. Nat. vi. p. 122, Observations on the Genus *Rhodoleia*, and proposed a new species (*R. Teysmanni*, Miq., from Sumatra), but he does not seem to have known Hance's valuable remarks on the above species, made on living plants.

Camellia *spectabilis*, Champ. This species is closely allied to *C. reticulata*, Lindl.

Duhaldea *Chinensis*, De Cand. After *Vernonia congesta*, Benth., put a !.

Gnaphalium *purpureum*, var. *spathulatum*. *Read* Lam. *instead of* Lour.

Gnaphalium *spicatum*. *Read* Lam. *instead of* Loureiro.

Eupatorium *Lindleyanum*. In the observation to this species, the word "margin" has been omitted.

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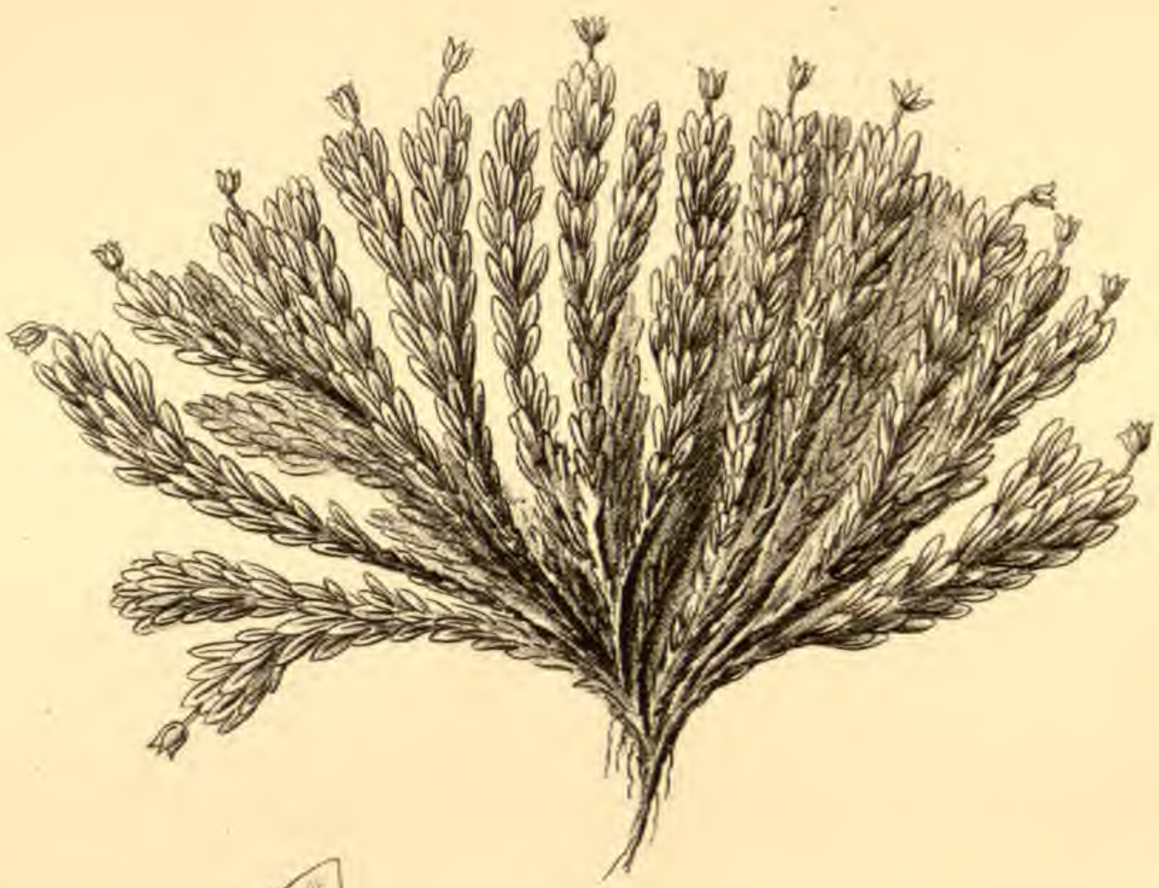
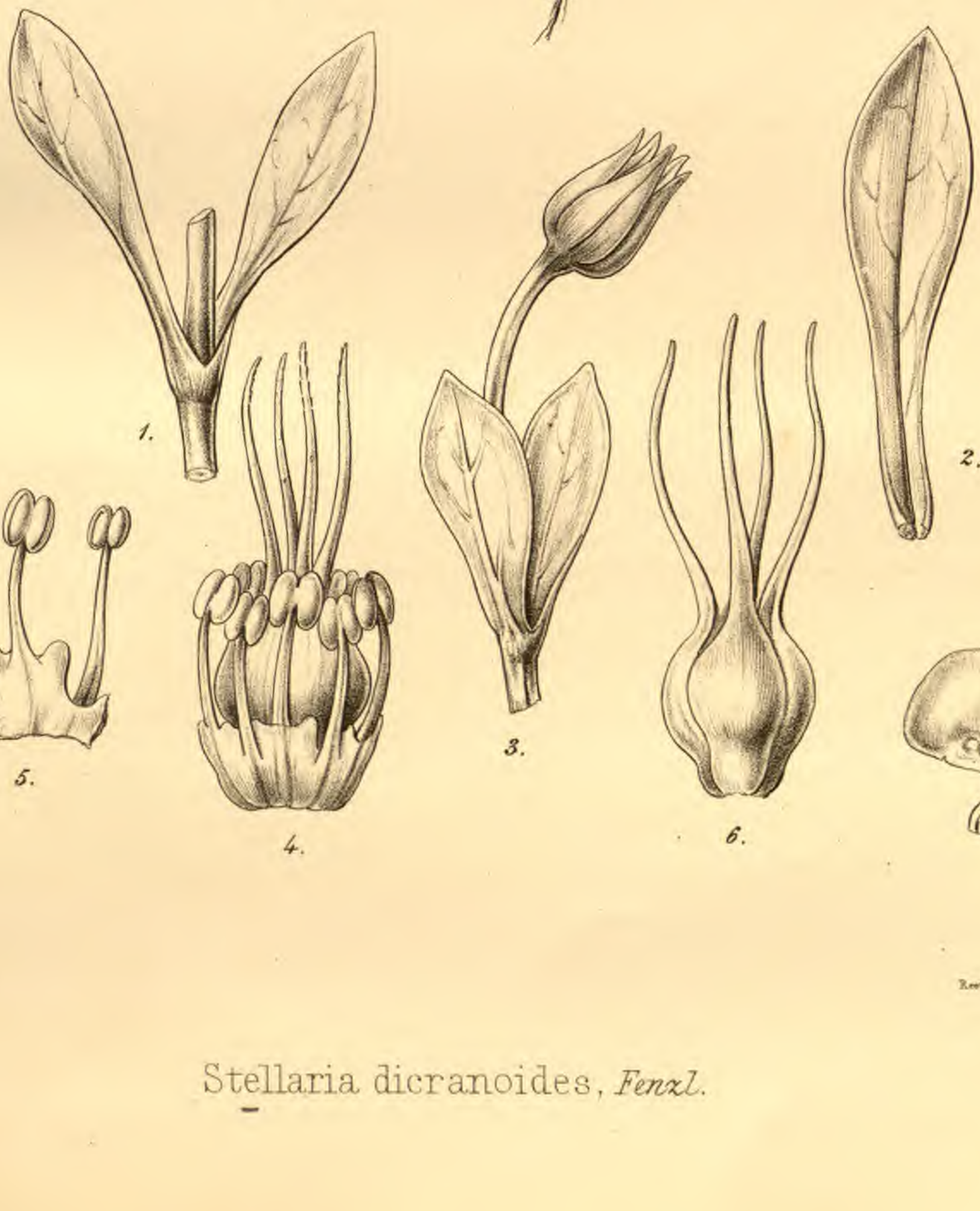
J. D. Hooker, del.

Reeve & Nichols, imp.

Tetrapoma pyriforme, *Seem.*





J. D. Hooker, del.

Reeve & Nichols, imp.

Stellaria dicranoides, *Fenzl.*

Dianthus repens, *Willd.*

J.D. Hooker, del.

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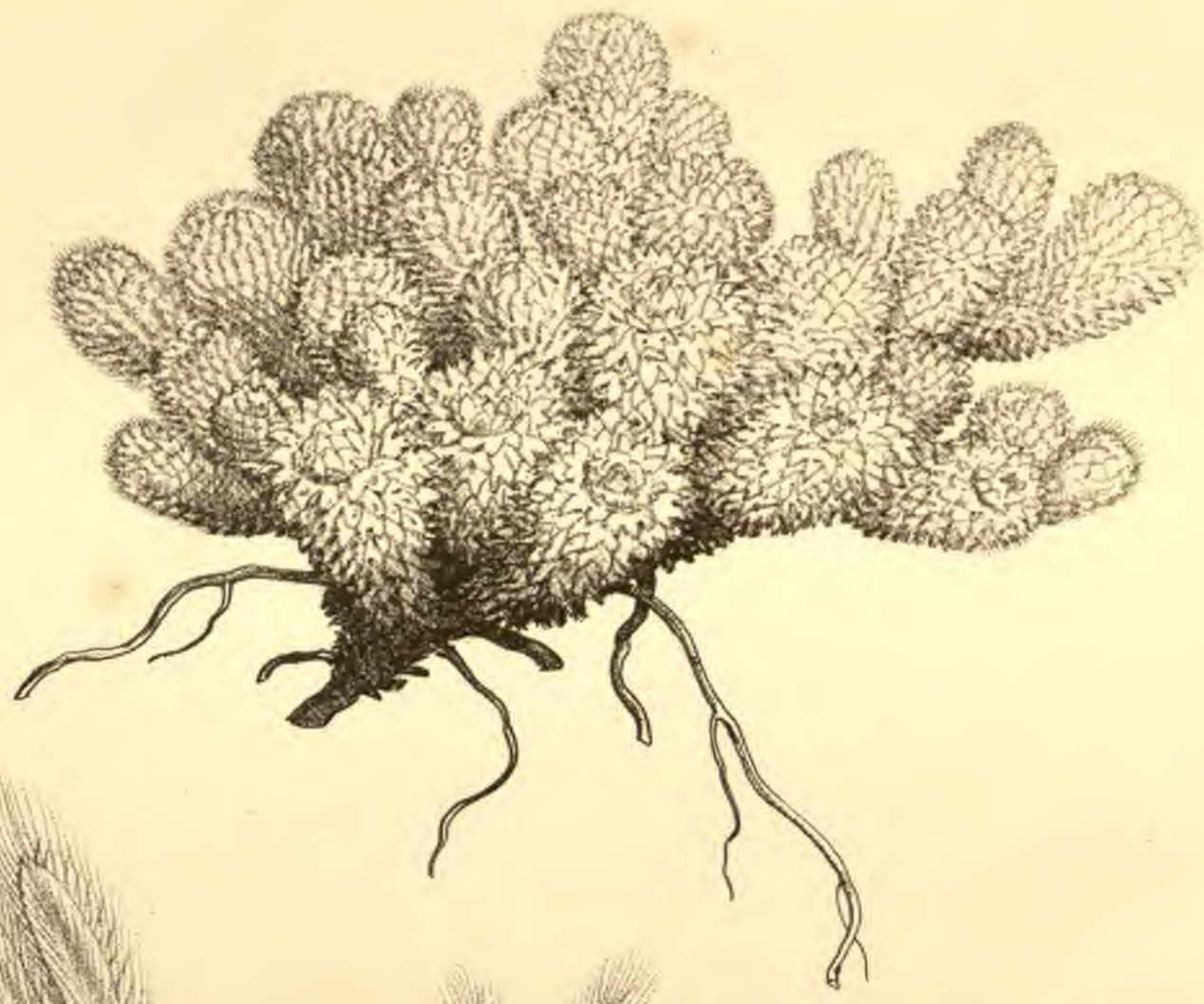
Claytonia sarmentosa, *C.A. Mey.*



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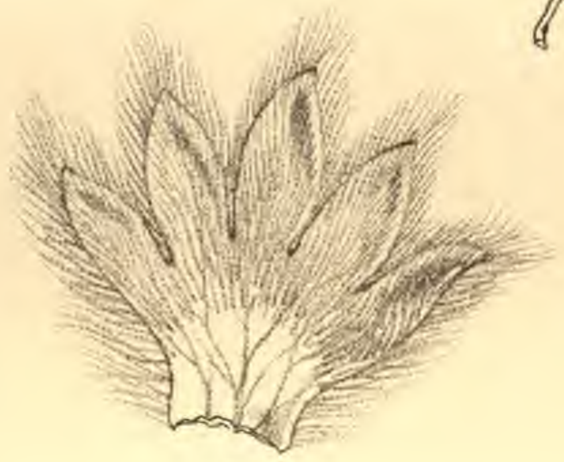

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Hooker, del. Fitch, lith.

Artemisia androsacea. *Seem.*

F. Reeve, imp.

J. D. Hooker del.

Saussurea subsinuata, *Led.*

Reeve & Nicholls, imp.

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J. D. Hooker, del.

Reeve & Nichols, imp.

Eritrichium aretioides, *Alph. D.C.*

J. D. Hooker, del.

Reeve & Nichols, imp.

Dodecatheon frigidum, *Cham.*

J.D. Hooker, del.

Salix speciosa, *H.&A.*

Reeve & Nichols, imp.

(pl. XI. XII = 2 on sep.)

Plate XIII.

J.D.Hook.anal. Fitch del et lith.

F. Reeve. imp.

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J.D.Hook.ad.nat. Fitch del et lith

F.Reeve imp

Alsodeia sylvatica. *Seem.*

J.Gilloch, Annal. Fruit. del et lith.

F.Reeve, imp.

Sloanea quadrivalvis *Seem.*

J.D.Hook. anal. Fitch del et lith.

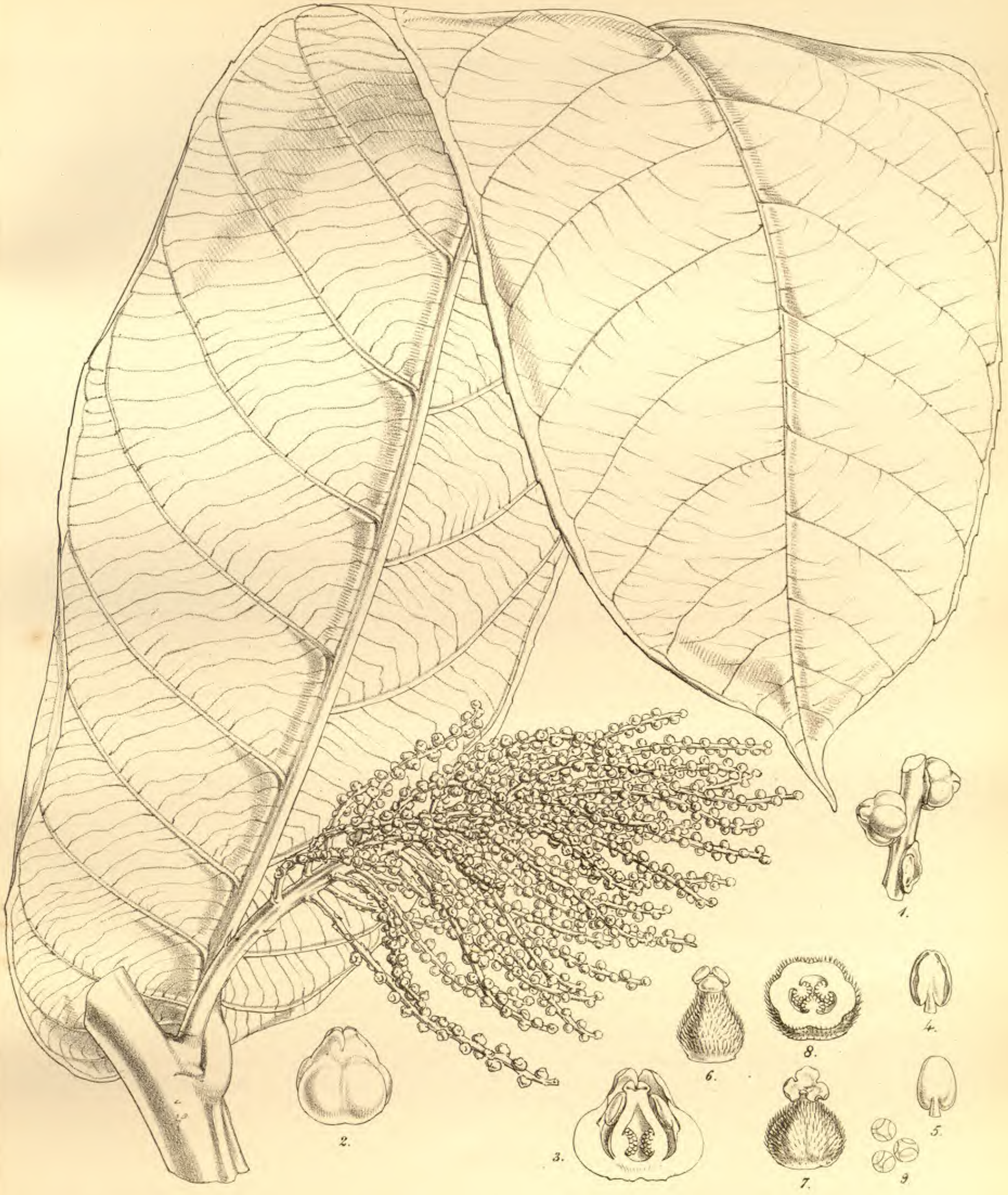
Saurauja montana. *Seem.*

F. Reeve imp.

J.D.Hook.ad.nat. Fitch del et lith.

F.Reeve imp.

Hypericum gnidioides. *Seem*



J.D.Hooker and Fitch del et lith.

F.Reeve imp.

Edmonstonia pacifica. *Seem.*

J.D.Hook. ad nat. Fitch del et lith.

P. Reeve imp.

Tephrosia nitens, *Benth.*

J.D.Hook. anal. Fitch. del et lith.

Rhynchosia picta. *Seem.*

P. Reeve, imp.

J.D.Hook and Fitch, del et lith.

F. Reeve, imp.

Platymiscium polystachyum. *Benth.*

J.D.Hook. anal. Fitch, del et lith.

F.Reeve, imp.

Calliandra Seemanni. *Benth.*

J.D.Hook anal. Fitch, del et lith.

W. Reeve, imp.

Inga Darienensis. *Seem.*

J.D.Hook. anal. Fitch, del. et lith.

F.Reeve, imp.

Picrammia umbrosa. *Seem.*

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J.D. Hook and Fitch, del et lith.

F. Reeve, imp.

Licania arborea. *Seem.*

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J.D. Hook anal.

F Reeve, imp.

Bellucia Aubletii *Naud.*

J.D Hook. anal Fitch, del et lith.

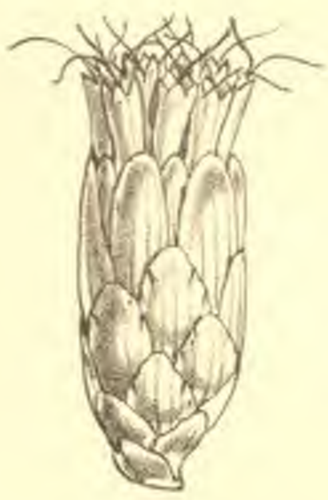
F. Reeve, imp.

Erblichia odorata. *Seem.*

J.D. Hook.anal. Fitch, del. et lith.

F. Reeve, imp.

Pentagonia Tinajita. *Seem.*



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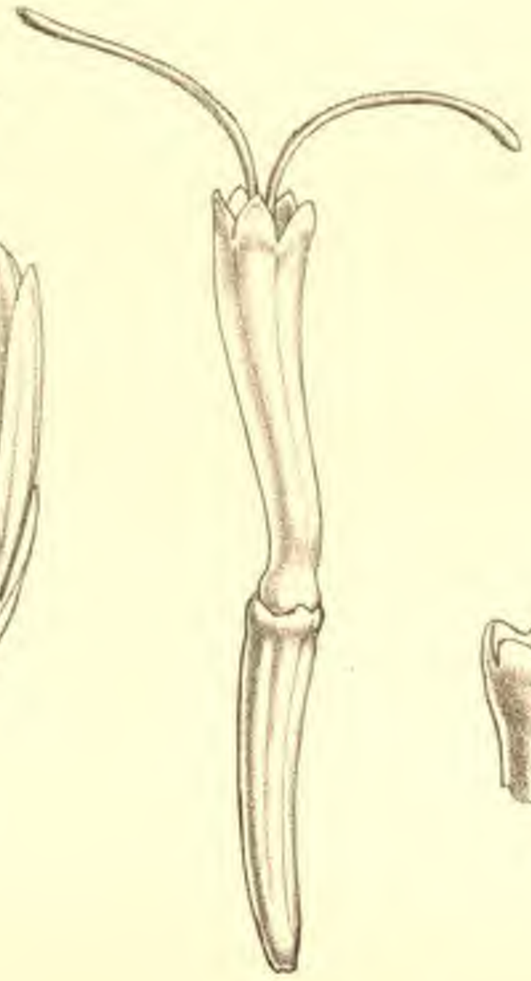

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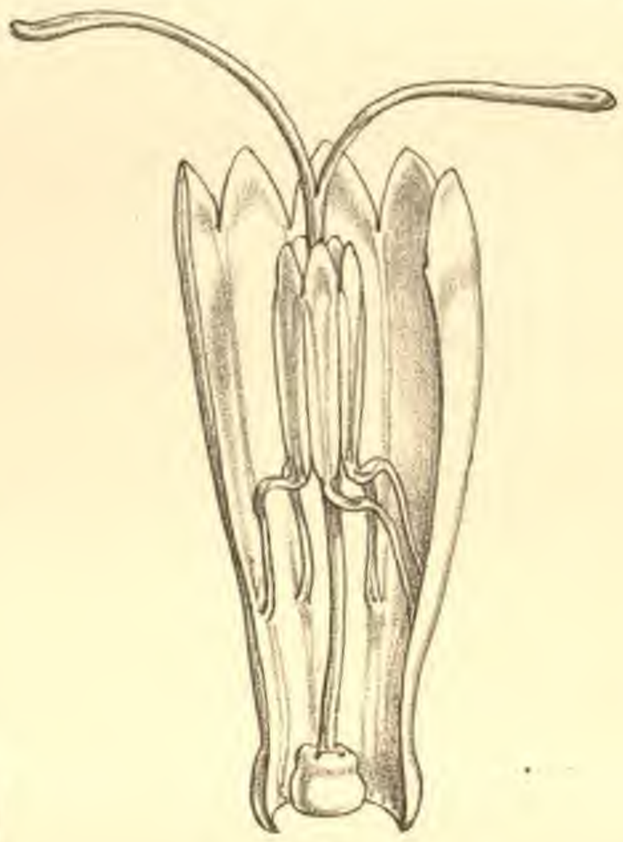

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J.D. Hook. anal. Fitch, del et lith.

F. Reeve, imp.

Tuberostylis Rhizophoraе, *Steetz.*

J.D. Hook, anal. Fitch, del et lith.

F. Reeve, imp.

Unxia digyna. *Steetz.*

J.D.Hook, anal. Fitch, del. et lith.

F. Reeve, imp.

Senecio arboreseens. *Steetz.*

J.D.Hook, anal: Fitch, del et lith.

F.Reeve, imp.

Parmentiera cereifera, *Seem.*

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J. D. Hook, anal. Fitch, del. et. lith.

Lamourouxia scabra. *Benth.*

F. Reeve, imp.

J.D.Hook, anal. Fitch, del et lith.

F.Reeve, imp.

Pisonia Pacurero, *Kth.*

J.D.Hook, anal: Fitch, del. et lith.

F. Reeve, imp.

Urostigma sapidum. *Liebm.*

J.D. Hook, anal. Fitch, del et lith.

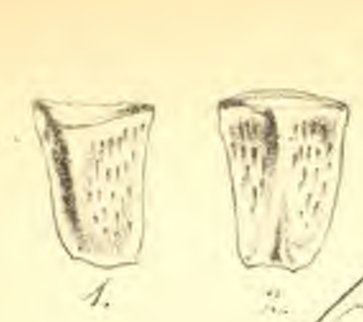
F. Reeve, imp.

Urostigma Oerstediana. *Miq.*

J. Hook, anal. Fitch, del. et. lith.

F. Reeve, imp.

Peperomia Seemanniana. *Miq.*



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J.D.Hook, anal. Fitch, del. et lith.

F.Reeve, imp.

Artanthe imperialis. *Miq.*

J.D. Hook, anal. Fitch, del. et lith.

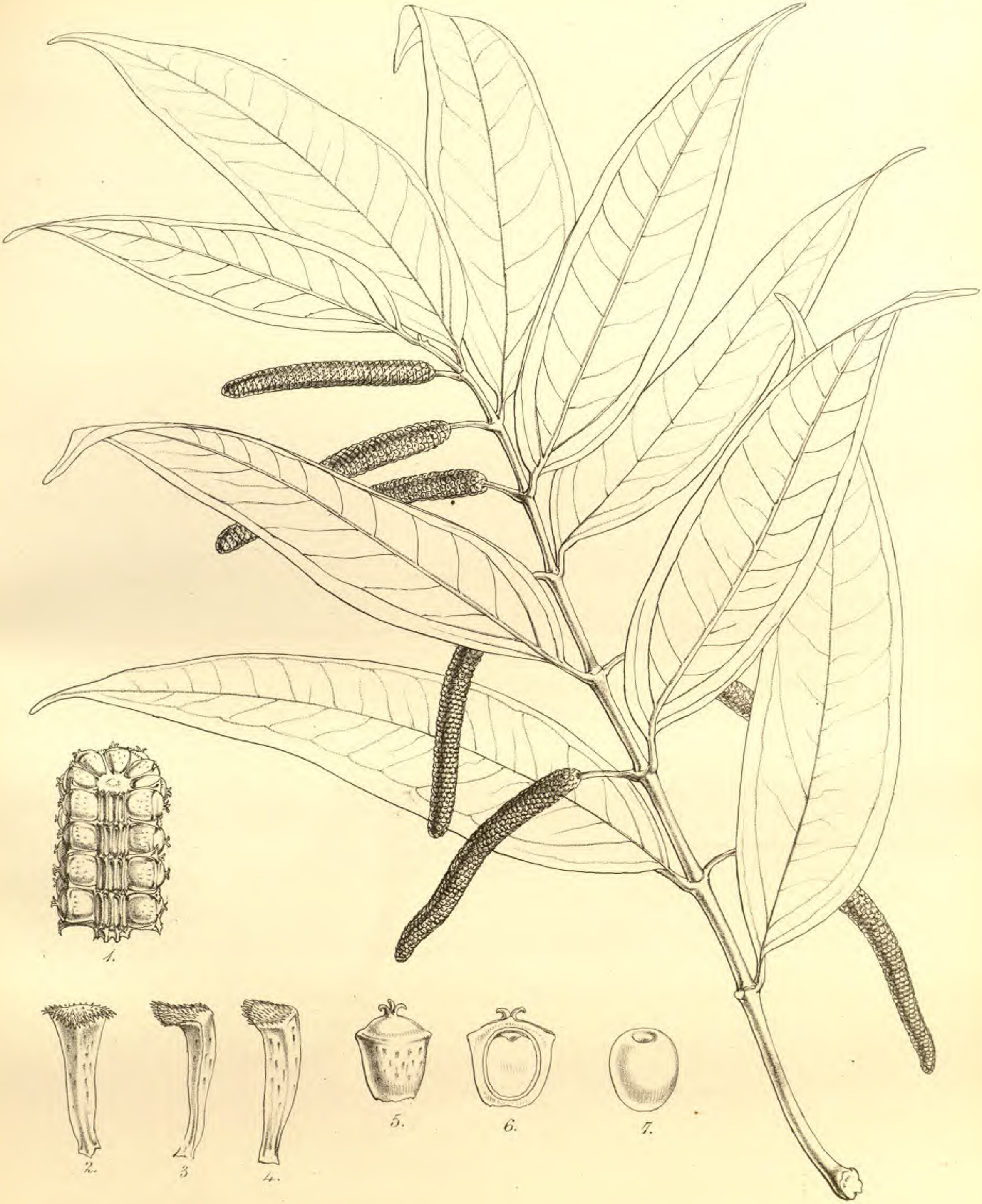
F. Reeve, imp.

Artanthe Seemanniana. *Miq.*

J.D. Hook, anal. Fitch, del. et lith.

F. Reeve, imp.

Artanthe septuplinervia. *Miq.*



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J.D.Hook, anal. Fitch, del. et lith.

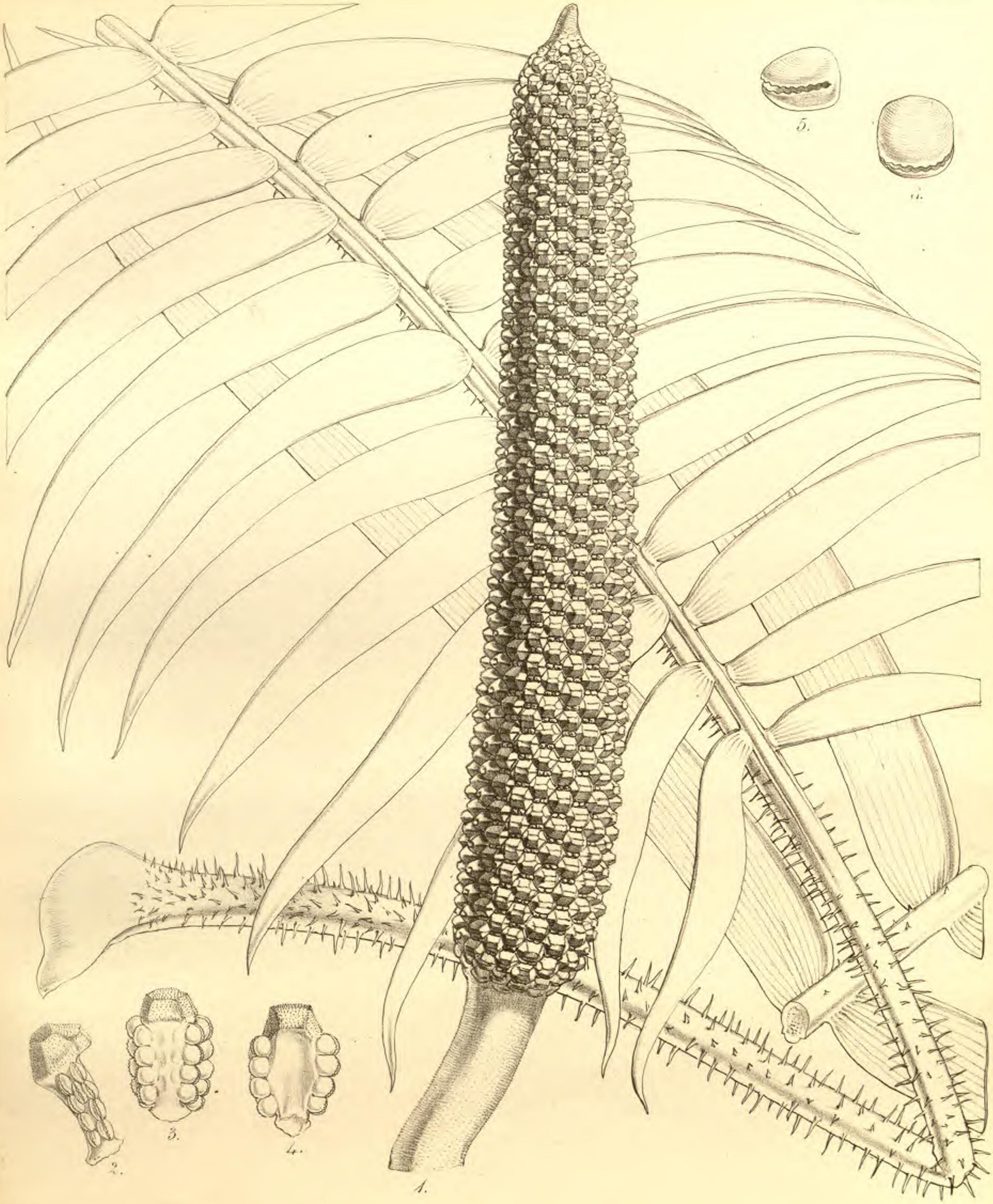
F. Reeve, imp.

Artanthe trinervia. *Miq.*

J.D.Hook, anal. Fitch, del. et lith.

F Reeve, imp.

Artanthe tricuspis. *Miq.*



J.D. Hook, and Fitch, del et lith.

F. Reeve, imp.

Zamia Chigua. *Seem.*

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J.D. Hook, anal. Fitch, del et lith.

F. Reeve, imp.

Cypripedium Hartwegi. *Reichenb. fil.*

J.D.Hook, anal. Fitch, del. et lith.

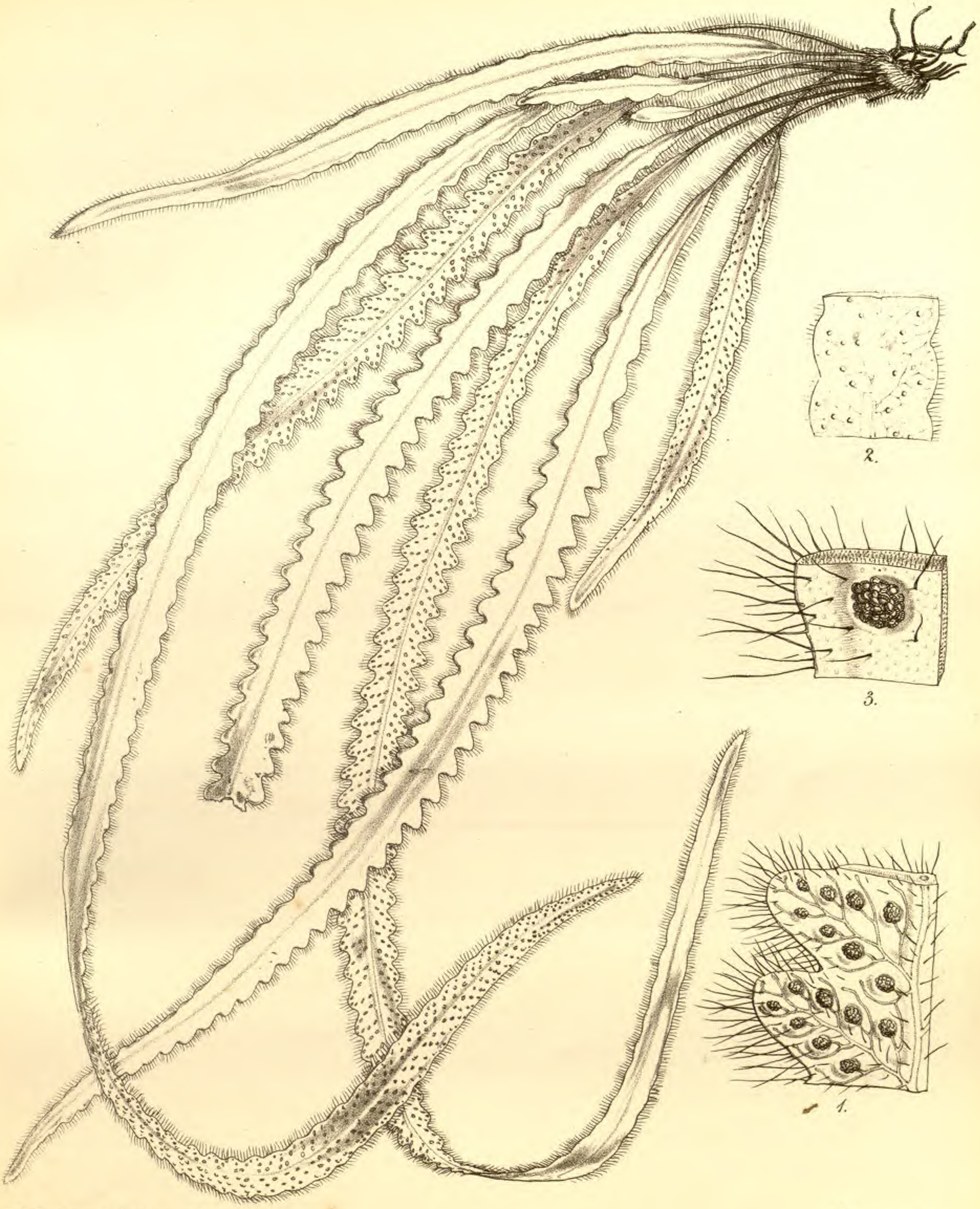
F.Reeve, imp.

Phytelephas macrocarpa. *Ruiz et Pavon.*

J. D. Hook, anal. Fitch, del. et lith.

F. Reeve, imp.

Phytelephas macrocarpa. *Ruiz et Pavon.*



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J.D. Hook, anal. Fitch, ad. et lith.

F. Reeve, imp.

Ctenopteris (Glyphotaenium) crispa. *J. Smith.*

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J.D.Hook, anal. Fitch del. et lith.

F.Reeve, imp.

Phegopteris Seemanni. *J. Smith.*

J.D.Hook, anal. Fitch, del. et lith.

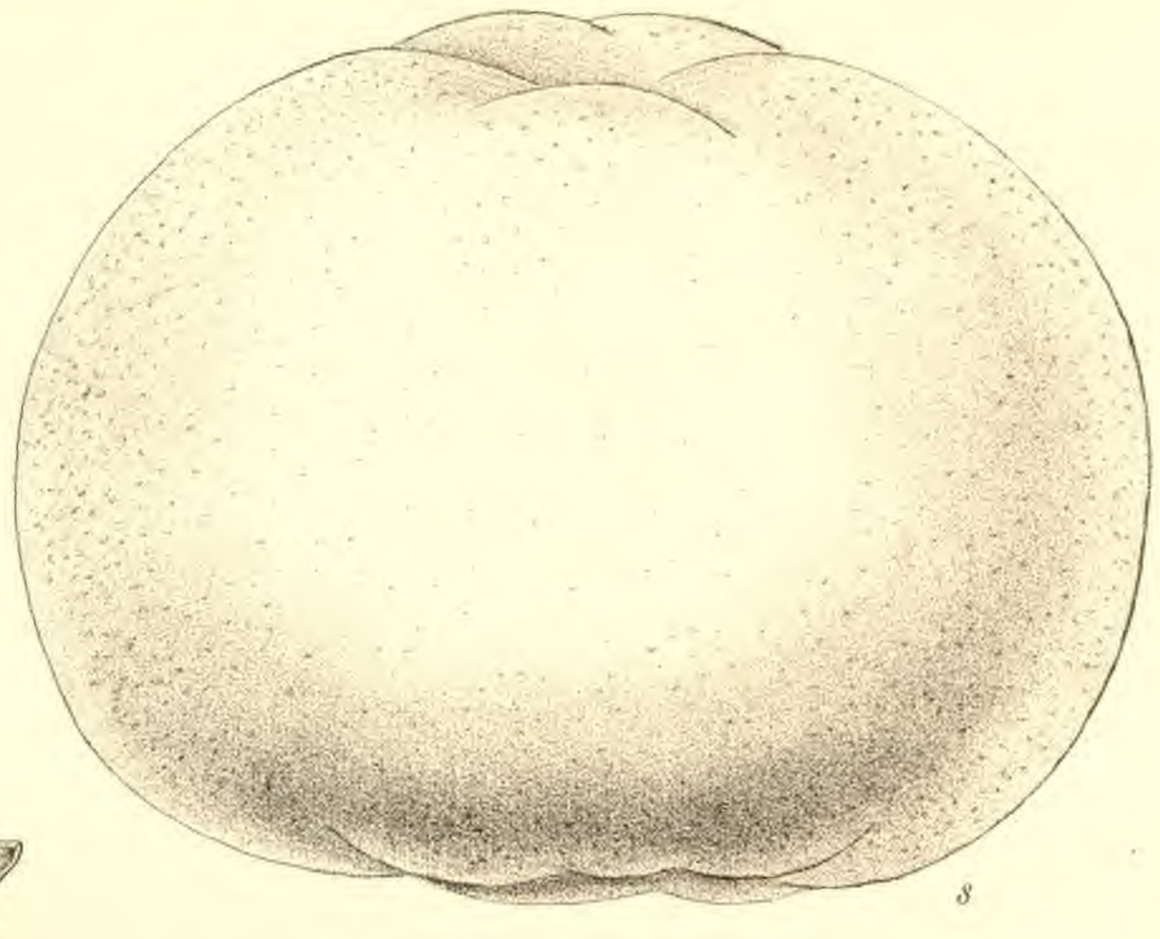
F.Reeve, imp.

Nephrodium Cumingianum. *J.Smith.*

J.D.Hook anal

Vincent Brooks Imp.

Casimiroa edulis, *Ll. et Lex.*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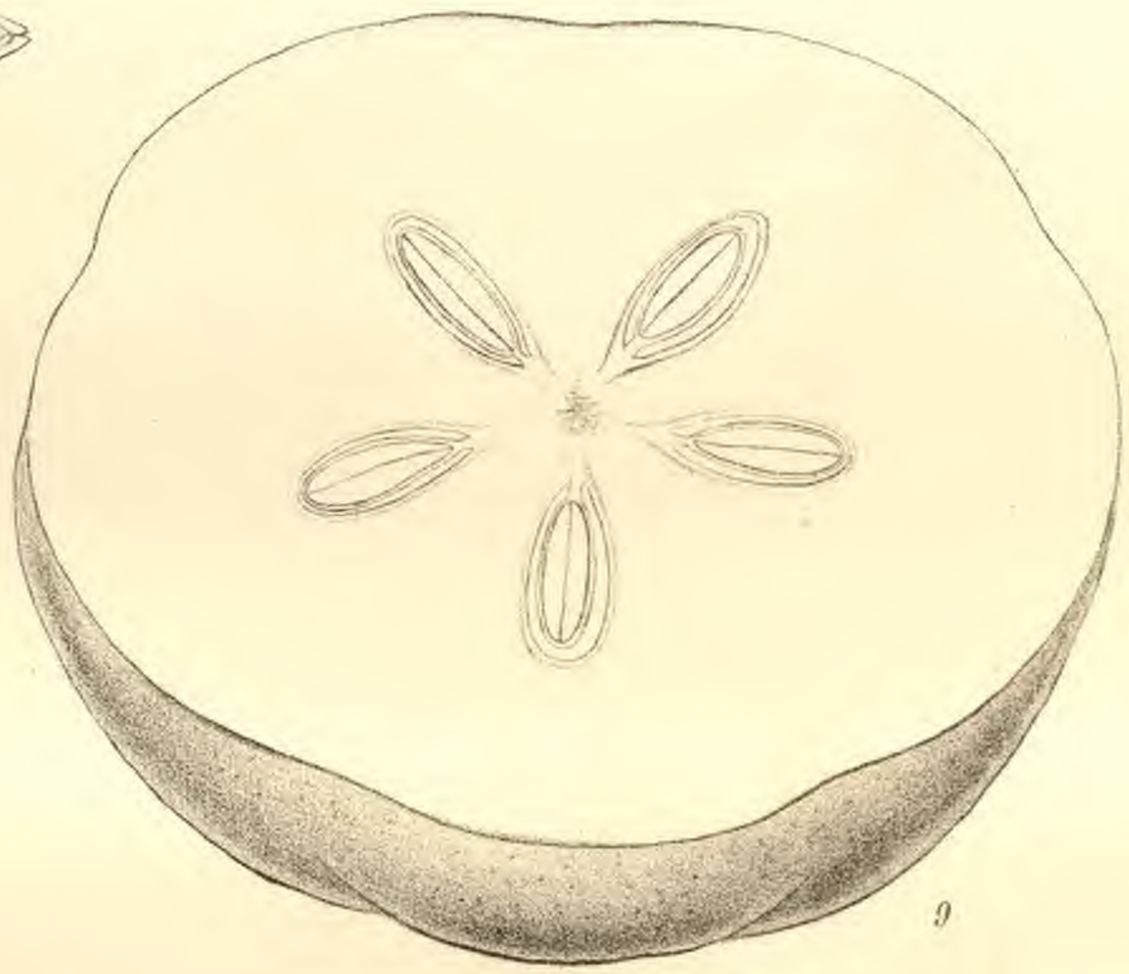
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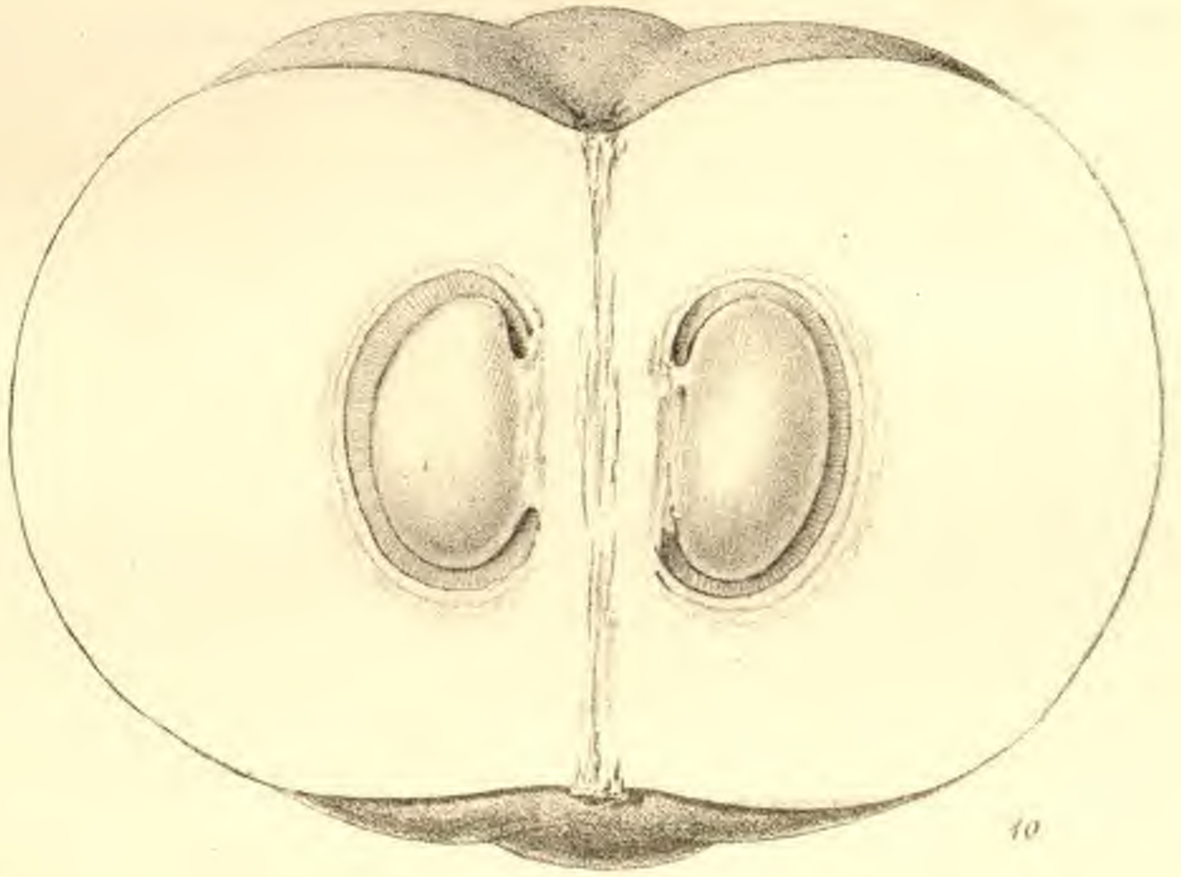
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J.D.Hook anal.

Vincent Brooks Imp.

Casimiroa edulis, *Ll. et Lex.*

J.D.Hook anal W.Fitch del. et lith.

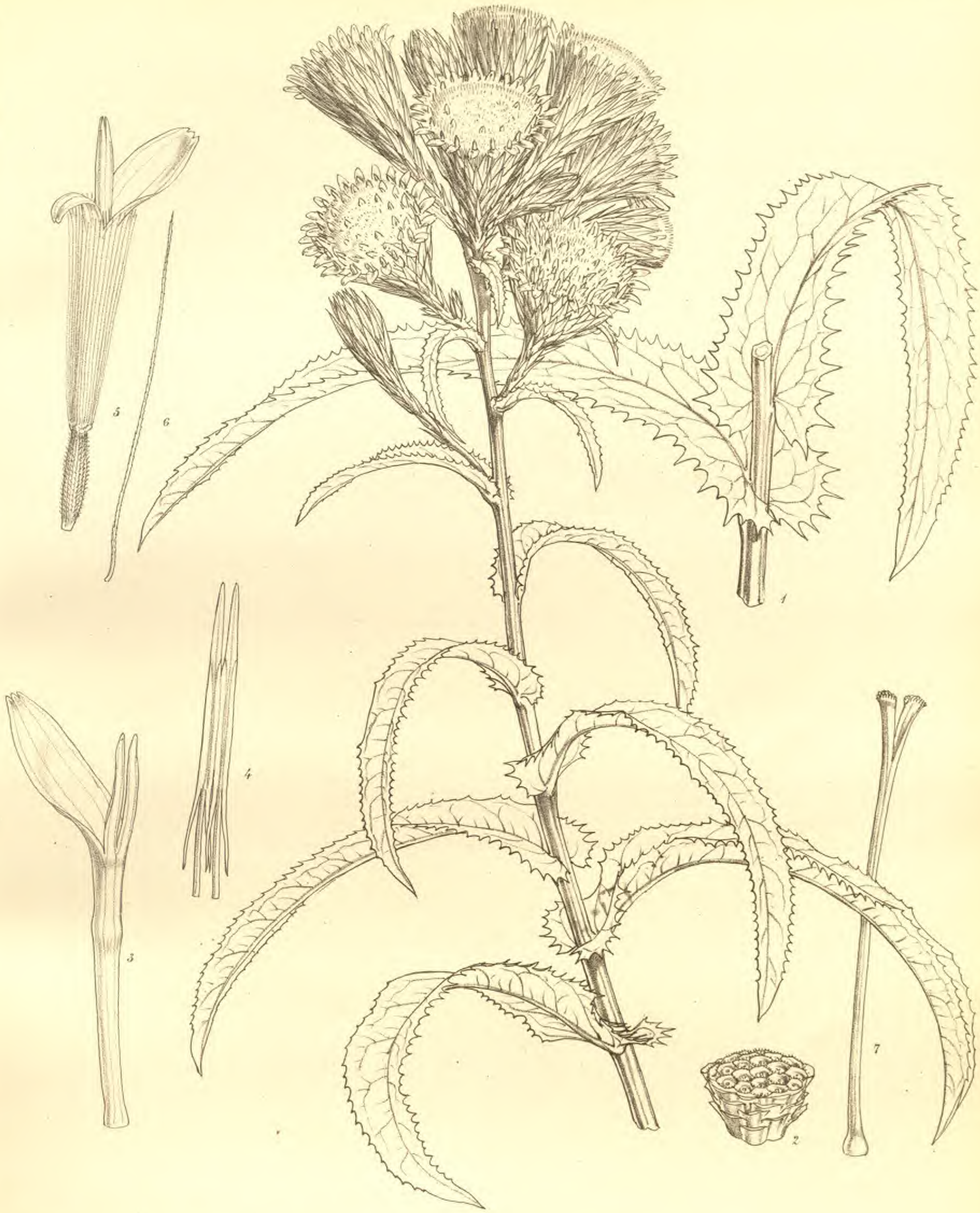
Vincent Brooks Imp

Lupinus madrensis, *Seem.*

JD Hook anal W Fitch del. et lith.

Vincent Brooks Imp

Acourtia Seemanni , *Schultz. Bip.*



J.D.Hook anal. W.Fitch del. et lith

Vincent Brooks Imp

Acourtia macrocephala *Schultz Bip.*

J.D.Hook anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Acourtia formosa, *Don*

J.D.Hook. anal. W.Fitch del et lith.

Vincent Brooks Imp.

Befaria Mexicana, *Benth.*

J.D.Hook. W.Fitch del. et lith.

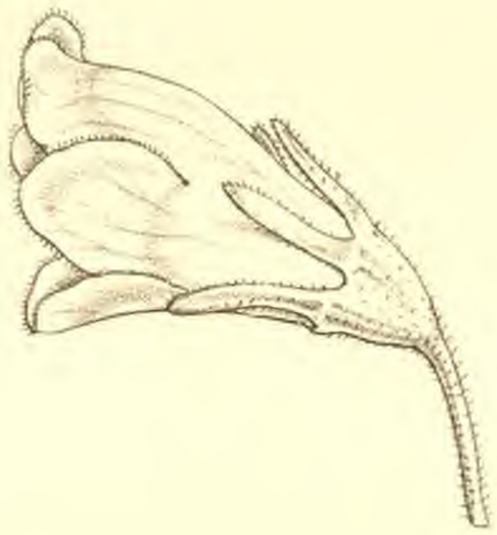
Vincent Brooks Imp

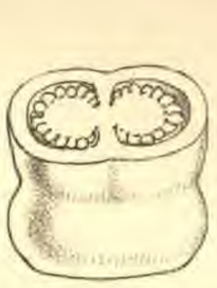
Mimulus madrensis, *Seem.*

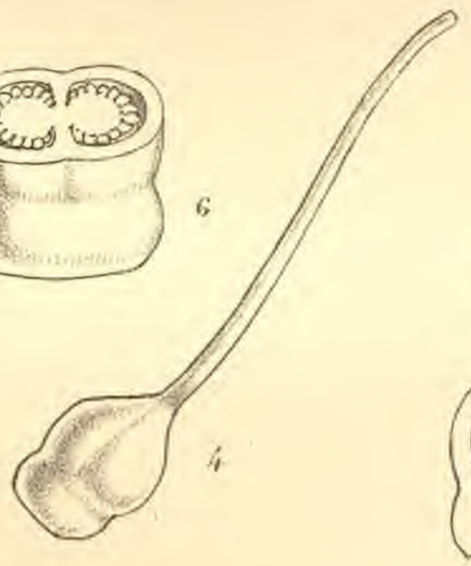
Seymeria bipinnatisecta, *Seem.*

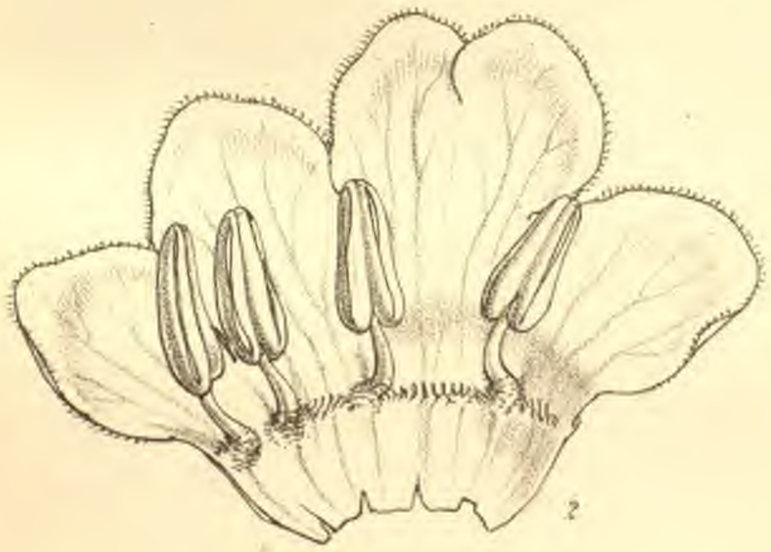
J.D.Hook. anal. W.Fitch del. et lith.

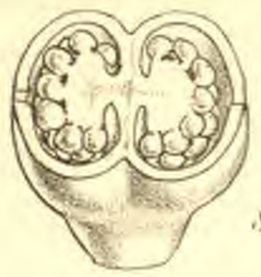
Vincent Brooks Imp











J.D.Hook. anal. W.Fitch del. et lith.

Vincent Brooks Imp

Seymeria virgata, *Benth.*

J.D.Hook, anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Galactia marginalis, *Benth.*

J.D.Hook, anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Viscum Reichenbachianum, *Seem.*

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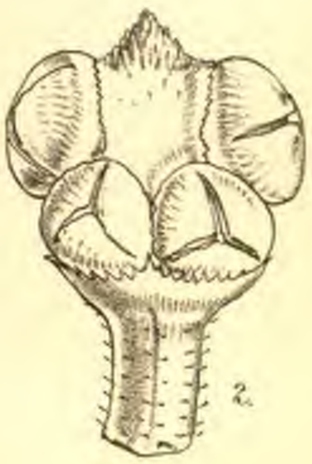
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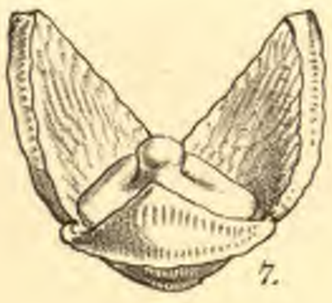
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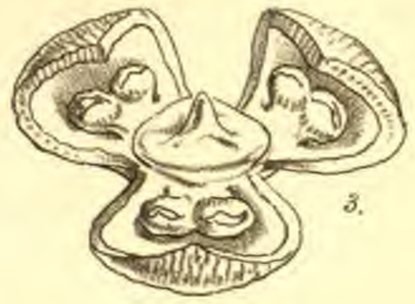
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J.D.Hook anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Viscum Bolleanum, *Seem.*

J.D.Hook anal. W.Fitch del.et lith.

Vincent Brooks Imp.

Hedyotis bouvardioides *Seem.*

J.D.Hook.anal.W.Fitch del.et lith.

Vincent Brooks Imp.

Calophanus bilabiatus, *Seem.*

J.D.Hook. anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Jacobinia Mexicana, *Seem.*

J.D.Hook. anal. W.Fitch del. et lith.

Vincent Brooks Imp

Sarotheca salviæfolia, *Nees ab Esenb.*

J.D.Hook.anal.W.Fitch del.et lith.

Vincent Brooks Imp.

Tetramerium polystachyum, *Nees ab Esenb.*

J.D.Hook, anal. W.Fitch del. et lith.

Vincent Brooks Imp

Dicyrta parviflora, *Seem.*

J.D.Hook.anal. W.Fitch dd.et lith.

Vincent Brooks Imp.

Salvia madrensis. *Seem.*

J.D.Hook, anal. W.Fitch del. et lith.

Vincent Brooks Imp.

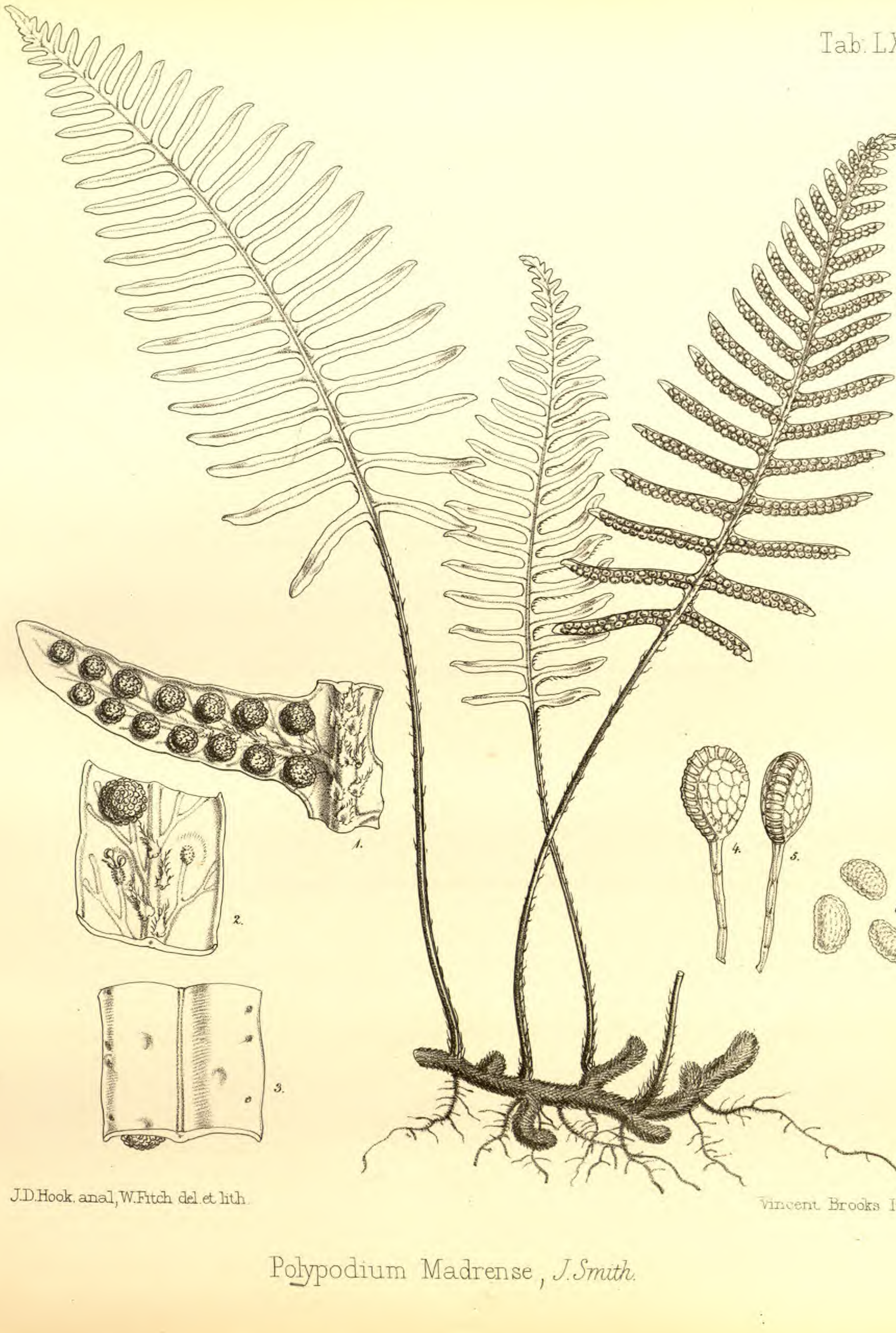
Vitex mollis, *Humb., Bonpl. et Kth.*

J.D.Hook, anal. W.Fitch. del. et lith.

Vincent Brooks Imp.

Aristolochia Wrightii, *Seem.*

Tab. LXXIII.



J.D.Hook. anal, W.Fitch del. et lith.

Vincent Brooks Imp.

Polypodium Madrense, *J.Smith.*

J.D.Hook anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Erya Macartneyi, *Champ.*

J.D.Hook. anal. W.Fitch del. et lith.

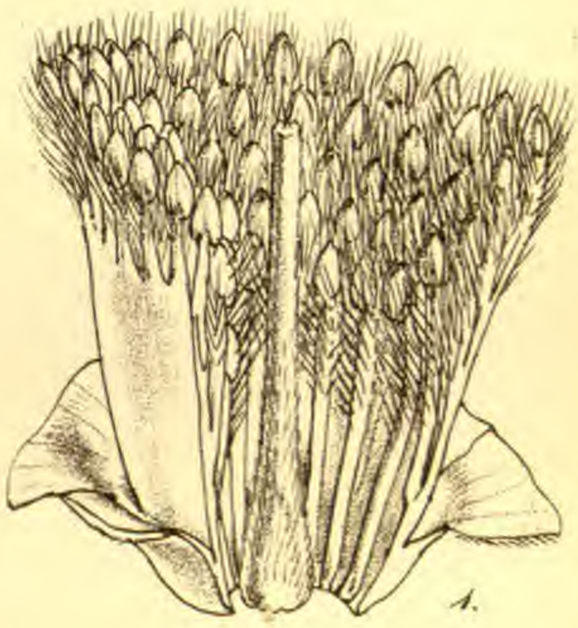
Vincent Brooks Imp.

Schima superba, *Gard. et Champ.*

J.D.Hook. anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Camellia salicifolia, *Benth.*



J.D.Hook anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Camellia assimilis, *Champ.*

J.D.Hook. anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Camellia spectabilis, *Champ*

J.D.Hook, anal. W.Fitch dd. et lith.

Vincent Brooks Imp.

Garcinia multiflora, *Champ.*

J.D.Hook, anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Acer reticulatum, *Champ.*

J.D.Hook anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Sclerostylis buxifolia, *Benth.*

J.D.Hook, anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Sclerostylis Hindsii, *Champ.*

J.D.Hook, anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Euonymus nitidus, *Benth.*

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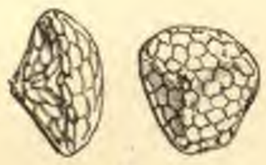
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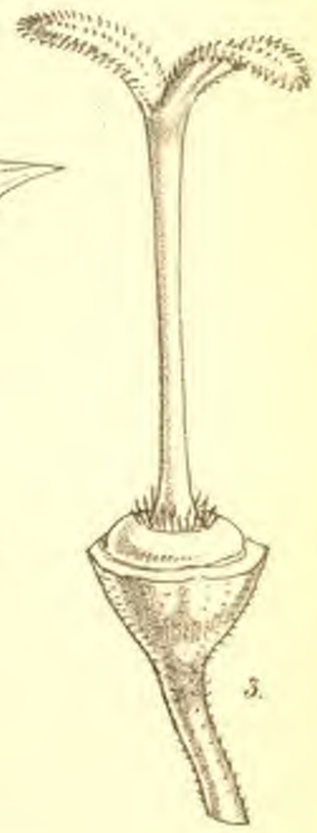
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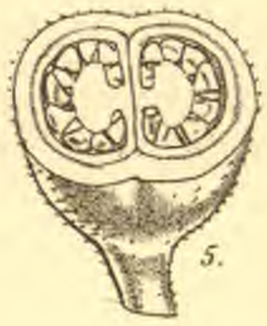
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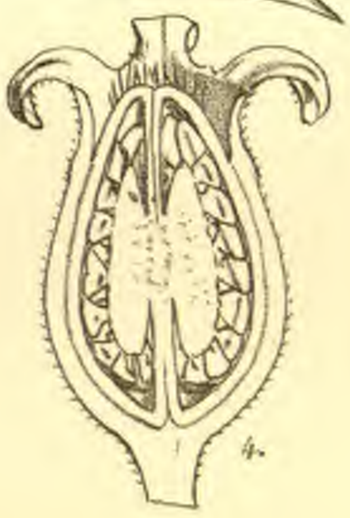
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J.D.Hook.anal. W.Fitch del et lith.

Vincent Brooks Imp.

Hedyotis recurva, *Benth.*

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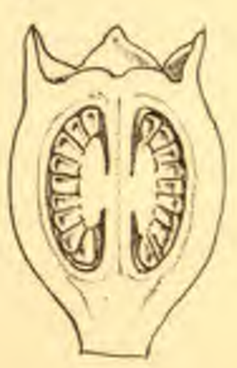

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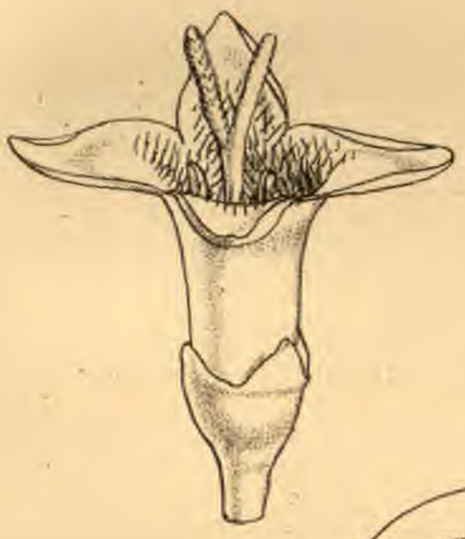

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J.D.Hook. anal. W.Fitch del et lith.

Vincent Brooks Imp.

Hedyotis acutangula, *Champ.*

J.D.Hook, anal. W.Fitch del. et lith.

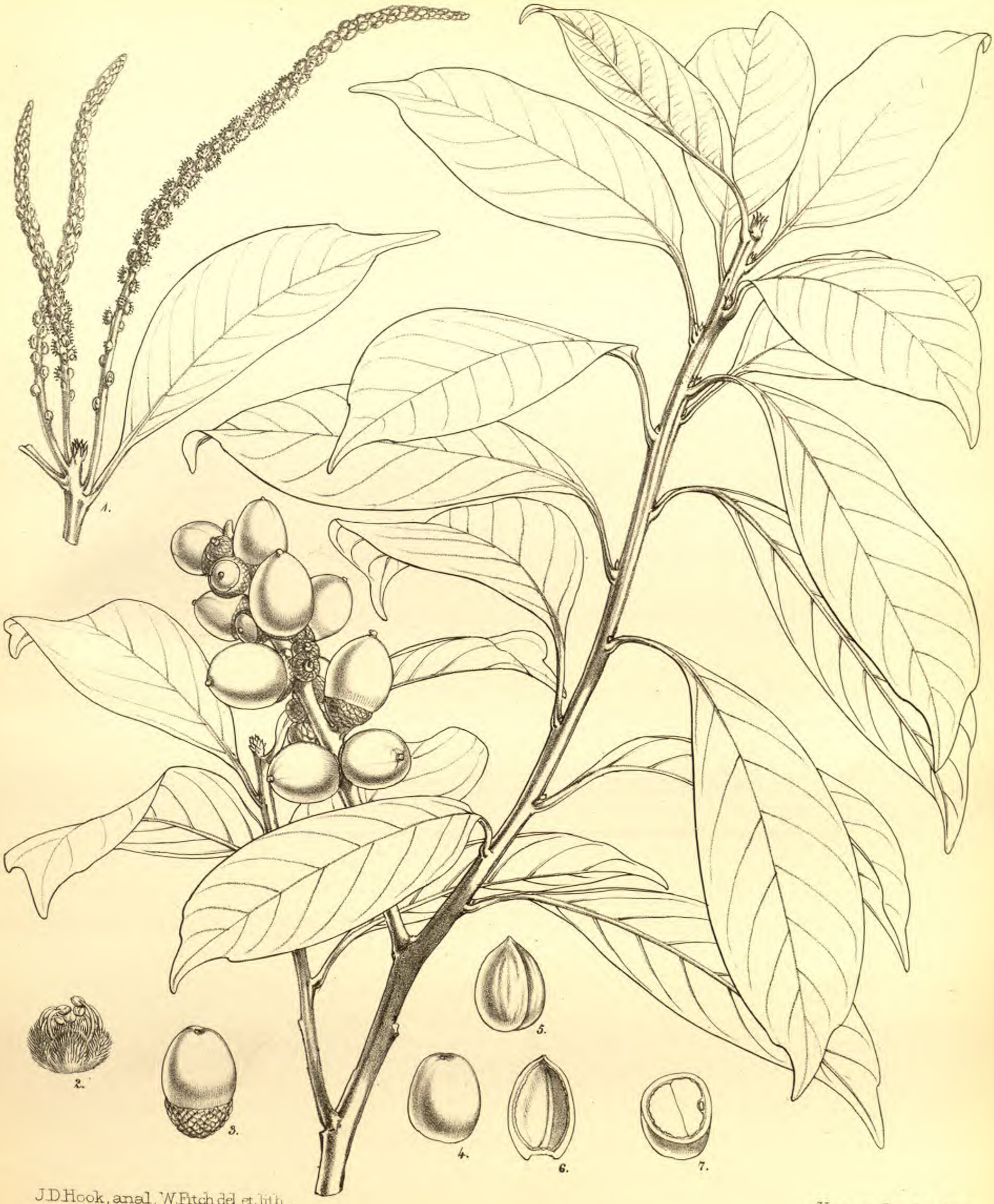
Vincent Brooks Imp.

Castanea concinna, *Champ.*

J.D.Hook. anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Quercus cornea, *Lour.*



J.D.Hook, anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Quercus inversa, *Lindl.*

J.D.Hook,anal. W.Fitch del.et lith.

Vincent Brooks Imp.

Quercus Harlandi, *Hance*.

J.D Hook.anal. W. Fitch del. et lith.

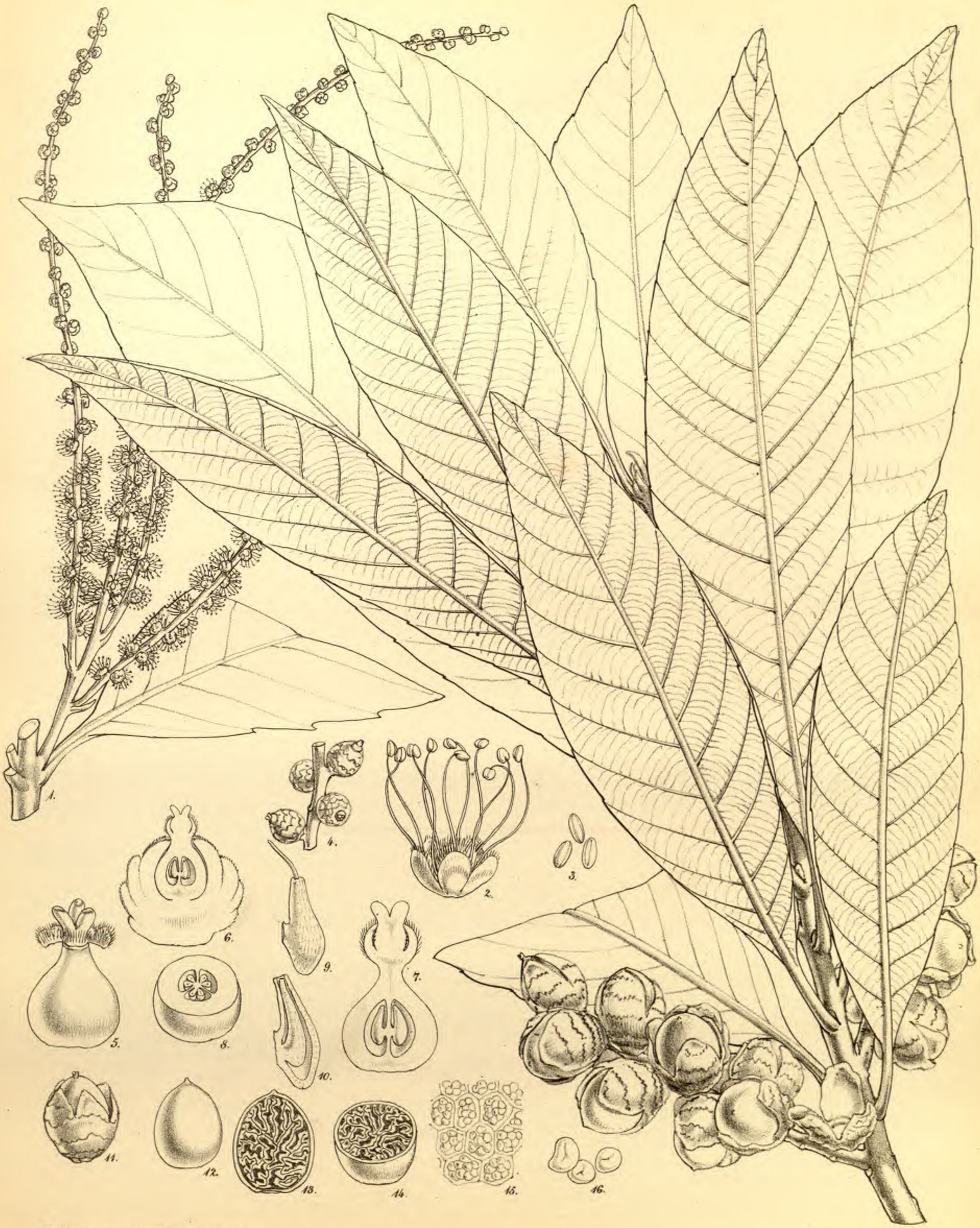
Vincent Brooks Imp.

Quercus Championi, *Benth.*

J.D.Hook, anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Quercus bambusæfolia, *Hance*.



J.D.Hook, anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Quercus fissa, *Champ.*

J.D.Hook anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Garcinia oblongifolia, *Champ.*

J.D.Hook. anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Liquidambar Chinense, *Champ.*

J.D. Hook. anal. W. Fitch del. et lith.

Vincent Brooks Imp.

Eustigma oblongifolium, *Gardn. et Champ.*

J.D.Hook.anal. W.Fitch del.et lith.

Vincent Brooks Imp.

Hancea Hookeriana, *Seem.*

J.D.Hook. anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Phyllanthus cinerascens, *Hook. et Arn.*

J.D.Hook.anal. W.Fitch del.et lith.

Vincent Brooks Imp.

Humulus Japonicus, *Sieb. et Zucc.*

J.D.Hook. anal. W.Fitch del et lith.

Vincent Brooks Imp.

Smilax lancæfolia, *Roxb.*

J.D.Hook. anal. W.Fitch del. et lith.

Vincent Brooks Imp.

Smilax glabra, *Roxb.*