



REPORT

ON THE

Vegetation of the Andaman Islands,

BY

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I WAS directed by Dr. T. Anderson, Superintendent of the Royal Botanical Gardens, Calcutta, in accordance with letter No. 1224 of the Government of India, dated 27th February last, to proceed on board Her Majesty's Steamer *Prince Arthur* to Port Blair, and to collect the material for a Flora of the Andaman Islands; and while doing this to ascertain the proportion which trees, known to be valuable for their timber, bear to the rest of the forest, and also to identify botanically all timber that might be shown to me by the local Authorities. I received also instructions to do all in my power to collect living plants and seeds for the Botanical Gardens, Calcutta.

2. Accordingly I left Calcutta on the 2nd April 1866, and arrived on the 9th of the same month at the place of my subsequent explorations. Having placed myself in communication with the Superintendent of Port Blair, I began my excursions on the 16th April, and explored subsequently nearly the whole of the forest tracts around Port Blair and most of the eastern coast from Macpherson's Straits up to Shoal Bay, as also a good part of the western coast as far as Island Bay before Port Campbell, and visited some of the Labyrinth Islands and Rutland.

On board of Her Majesty's Steamer *Diana*, which was placed at my disposal for a couple of days, I obtained an opportunity to proceed to the entrance of Middle Straits, whence I explored both the coasts of South and Middle Andaman as far as the western entrance of said Straits.

On the 11th May, however, when on the point of entering the interior of South Andaman from Escape Bay, I was seized by the Burmese convicts, whom the Superintendent of Port Blair had given me to assist me in my work, and was left tied up in the jungles by hand and foot on the ground. These and subsequent circumstances, which rendered the carrying out of my proposed excursions through the Islands impracticable, obliged me to return in her Majesty's Steamer *Feroze* to Calcutta, where I arrived on the 20th July last.

THE little Sketch Map (Appendix A.) of South Andaman shows partially the parts visited by me, and also the large extent of country remaining still to be explored.

Appendix A.

3. The time of my visit occurred in April and May, the two hottest months in the year. I, therefore, had great difficulty in procuring flowers or fruits, as many of

Unfavorable time of the deputation.

the trees were destitute of them, and many were quite leafless; as were also a number of shrubs; several perennials and annuals, amongst them also some interesting grasses, were burnt up to such a degree that it was impossible to determine anything beyond the family to which they belonged. In the first-half of May the regular rains set in with great force, and rendered the jungles very unhealthy.

The best time of exploring these Islands is undoubtedly shortly before the close of the rains, and from October to March. In this season drinking water is still to be had everywhere in the interior parts, and the Flora has not yet suffered from the influence of a dry and hot season.

4. The time allotted to me for the exploration of these Islands was too short for a botanical investigation of a tract of land extending nearly over three geographical degrees, and destitute of any other means of communication than that by water, and consisting of pathless jungles, for the most part never before trodden by any European.

The difficulty I had in obtaining at Port Blair such a conveyance as would enable me to do my work more systematically, retarded much the progress of my explorations. I, therefore, was obliged to restrict my excursions to South Andaman and adjacent Islands,—the most important part of the group, and extending over rather more than 1,200 square miles.

5. The whole of South Andaman and Rutland is a hilly country, traversed by narrow and steep ridges of no great height, and encircled by a complete barrier-reef, on which a line of breakers is foaming during the rise of the tide.

These dangerous reefs are formed chiefly of *Caryophyllia*, *Madrepora*, *Porites*, *Meandria*, and other reef-forming corals. Between high and low water-mark there exists in some places a swampy mass formed by a large number of yellow and flesh-colored carious sponges, covering the coral reefs, and exhaling a disagreeable smell in the neighbourhood.

The principal ranges all run from south by west to north by east, thus somewhat in the direction of the lines of out-crop of the different strata. They are most developed along the eastern coasts, where they attain sometimes a height of 12 to 1,300 feet, sending out numerous spurs towards the sea. Ford Peak on Rutland Island may perhaps exceed 2,000 feet in elevation, and the Saddle Mountain in North Andaman is rather more than 3,000 feet high. Towards the western coasts they gradually become lower; and nowhere on that coast are higher ridges observed than from 2 to 300 feet elevation, bounding usually fertile valleys of comparatively large size. Some isolated hills, however, may be seen further inland, which I estimate to be between 5 and 600 feet high.

The whole surface appears to be intersected everywhere by numerous steep ravines, which open out in all directions, and cause great difficulty in penetrating to the interior parts of the Islands, which, I suppose, lies in general at a very low level.

The hills and ridges slope very precipitously along the sides towards the sea, commonly at an angle of about 45° to 45°, and often far more. On their sides, towards the interior, this angle is generally reduced to 20° or 25°, but exceptions can be seen everywhere.

The geological formations of the whole of South Andaman and the Archipelago, as well as of the southern parts of Middle Andaman, is, as Mr. W. Blandford, Deputy Superintendent of the Geological Survey, Madras, informed me, quite identical with those of the Arracan coast.

* For the determination of the rocks and other valuable observations, I am indebted to Dr. Stoliczka and Mr. W. Blandford, of the Geological Survey of India.

Chloritic Rock.—A broad strip of an indurated chloritic rock, probably some kind of green stone or trap, pervades the interior from Mangrove Bay and Watering Cove northwards in the direction of the higher ranges of the eastern coast and reaches the eastern sea shores at Middle Andaman. The same rocks appear also on Termoklee Island (one of the Labyrinth Islands), where they come in contact with coarsely stratified serpentine rock. This indurated rock appears to be rather felspathic, it is of a greenish color, scarcely stratified, but intersected by veins of quartz and calcareous spar. Small cavities occasionally occur in the rock, exhibiting on the interior of the walls a large number of quartz crystals and other minerals. It is remarkable that, so far as my observations allow me to judge, this green rock seems to occupy the greater part of the level lands, but it does not form ridges or hills of any height worthy to be noted; but we know, in fact, nothing about the formation of the hills in the interior parts.

Sandstone.—The next rock, which covers a great area of South Andaman, is a grey sand-stone, dipping to north by west with an angle of from 43 to 45°, or thereabouts. This sandstone is throughout of a very fine grain, showing a large proportion of silica, and occasionally being rather micaceous. The strata exhibit usually a distinct cubic structure. The rock itself decomposes easily, and forms in general a good clay soil.

Along the western coast at Port Mout this rock is excavated and variously worked out by the sea, exhibiting there many fantastically formed rocks, resembling in appearance the lime-stone rocks on the Mingan Islands.

Often, as for instance very finely on Bird Island near Viper, this sandstone is interlaid with thin layers, colored rusty by oxide of iron.

Serpentine Rocks.—Serpentine rocks are found chiefly to the south of Corbyn's Cove in a south-western direction, and including nearly the whole eastern part of Rutland Island (but also occurring on Termoklee Island). This formation is easily traceable all along the coast by the reddish color of the rocks, or by the brick-colored soil, which originates from its decomposition. The strike and dip are in general the same as that of the grey sandstone.

At Bird-nest Cape, where these rocks attain a height of 70 feet or more, a cubic structure, similar to that of the common grey sandstone, can be observed.

The unaltered rock is mostly of deep green color, as impure serpentine rocks usually are. The stratified portion of the rock, however, which is much more decomposed, exhibits chiefly a reddish brown color, and is very ferruginous in some places. It would be, perhaps, worth smelting, but I saw no limestone at hand.

Behind Homfray's Ghant a narrow strip of serpentine is met with, which might also be usefully employed for practical purposes. It is tolerably pure and quite soft, so as to be easily cut with a knife.

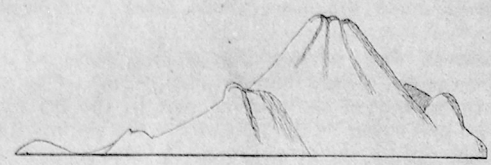
At Macpherson's Straits a dark-green variety of serpentine rock, with diallage is seen, not only in isolated rocks in the sea, but also on the low ridge of the coast.

Syenite.—A microcrystalline syenite has been traced near Watering Cove. It seems to be only of a very limited extent, and surrounded everywhere by the indurated chloritic rock.

Conglomerates, formed of coarse pebbles of quartz, chloritic serpentine and sandstone, have been observed in large quantities at Muddy Creek, at Shoal Bay, and on Termoklee Island. They occur principally in the sea.

No fossils whatever have as yet been observed on the Andaman Islands.

Barren Island is an active volcano, about 50 miles distant from Port Blair, and already too well known to need any further remarks upon it.



Narcondam Island from N. W. 1/4 W., seen from a distance of about 20 miles.

Narcondam Island has an extinct volcano remarkable for the great height of its cone, being twice as high as the outer wall. Owing to the great height of the cone (perhaps 2,000 feet) in proportion to the surrounding wall, this Island must have sunk very much, or the volcano must have been formed from a considerable depth in the sea.

6. The diversity of soil, considering the smallness of the Islands, is great. Generally, however, the different kinds of soils may be brought under the three following heads, which correspond with the three principal formations, viz:—

Diversity of soil.

1.—The brick-colored soil, extending over the decomposed serpentine rocks.

2.—The yellowish clay, following the sandstone formation, and therefore the most extensive and important kind of soil.

3.—A greyish or blackish soil, characterised by the considerable quantity of silicious particles it contains, and covering the indurated chloritic or green stone rock. A black humous soil is predominant in the level valleys, especially along the eastern coasts and on Termoklee Island, where the kuppalee trees grow beautifully.

According to the greater or smaller amount of moisture, these different kinds of soil are more or less mingled with decayed vegetable matter, and accordingly are more or less fertile.

7. No veins of metals have been observed during my excursions on South Andaman and the southern part of Middle Andaman. Oxide of iron is indicated everywhere, as already mentioned, by the rusty color of some sandstones and other rocks; and iron pyrites not unfrequently occurs in the chloritic and serpentine rocks.

Metals.

8. When approaching the Middle Straits from the south, a narrow reef can be observed (Barren Reef) at the entrance of the same, extending into the sea from South Andaman in a nearly easterly direction. This reef is covered with dead and bleached trees, variously damaged by the influence of storms and weather. The first impression is accordingly that all these trees have been destroyed by the influence of the north-east monsoon. I observed, however, the same phenomenon along the whole length of the Straits, both on the reefs as well as in the mangrove swamps. Old trunks appeared from time to time in the sea, with their roots still attached to the ground.† This induced me to examine this peculiar feature more carefully, and I landed for this purpose at different places on both coasts of South and Middle Andaman. Some of the stumps of the trees proved to belong to such species as never grow in the mangrove swamps, nor in any locality such as that in which they are now standing. They appeared to me to belong to *Pongamia*, *Erythrina*, *Thespesia*, and even to *Mimusops Indica*, accompanied by other strongly buttressed trunks. Also stumps of *Bruguiera gymnorrhiza* were frequent, and of a larger size than those which grow close to the shores, but apparently agreeing with those which are everywhere found further up the creeks. All these (except the last mentioned) are trees which never occur in the mangrove swamps,

* In Darwin's Map the Andamans are noted as "rising."

† I find also the same phenomenon.

but in a sandy soil just behind them, or else bordering the sea where the shores are very steep and not adapted for the formation of mangrove swamps. This latter circumstance, however, cannot be the case here, the shores at the places where I made the observations being level for some thousand paces inland.

A more evident fact proving the sinking state of these Islands can nowhere be seen more clearly than in these Straits. One can there trace in several places the stumps of the sunken trees in the sea up to the state where the trees are just dying by the influence of the sea water, and the subsequent change of the soil by the formation of the mangrove swamp.

The sinking state of the Islands is further shown by another fact recorded in the Report of the Andaman Committee, dated 1st January 1858, in Sections 8 and 9. There it is stated that the sea had encroached some 40 or 50 feet since the first Settlement at Chatham Island in Port Cornwallis, so that the store-house that stood there has been destroyed by the sea since the abandonment of the place in 1796. An examination of the spot and of the documents relating to that Settlement might give us some guide to determine the rapidity with which these Islands are becoming submerged.

Lieutenant Jameson, of Chatham Island, has informed me that a similar encroachment of the sea is taking place at that Island in Port Blair.

Andaman Straits, which is impassable at low water for boats, will perhaps afford another good proof of this subsidence. I had no opportunity of visiting these Straits.

Macpherson's Straits, owing to its more abrupt coasts, does not exhibit this phenomenon, as far as I was enabled to ascertain.

It is also a matter of great interest to decide the question whether the rapidity of the submersion takes place equally through the whole group of Islands, or rather whether it is a decreasing one towards the northern extremities.

Dr. Mouat, in his able account of the Andaman Islands (Selections from the Government of India, No. XXV.) maintains quite a contrary view of this subject, as is shown in his preface where writing about the Andaman Islands, he says—"They are collections of Islands surrounded by most dangerous coral reefs, which are gradually forming innumerable Islands, as each becomes lifted above the surface," &c.

Dr. Von Liebig (in the same Records, p. 127) points to a probable rising of Barren Island, recording thus—"One of the most remarkable amongst these was a stratum of rounded stones, like large pebbles, cemented by tufa, exactly like those of the present beach, but at a considerable elevation (about 20 feet) above the high water-mark, showing that the sub-marine base of the Island must have been raised since those pebbles had been washed by the sea."

Dr. Playfair (C., p. 123) however says—"I could not, after very careful examination, satisfy myself that there had been any recent upheaval of the Islands, none of the rocks exhibiting signs of having been water-worn."

It may be remarked that Barren Island is an active volcano therefore, probably rising and sinking.

From a practical point of view, the fact of a sinking state is of importance, as we see all along the shores small fertile valleys opening towards the sea, and preparing themselves gradually for mangrove swamps.

Suppose the gradual submersion to be one foot in a hundred years (which is rather a low estimate), we should see in a thousand years all the stores and houses along the beach at Ross Island and Middle Straits submerged, while so many harbours now dangerous would become open for navigation.

10. The temperature during April was very regular.

As, however, I had no instruments at my disposal, I could not make any observations of the amount of moisture it contained.

About the 10th of May the regular rains set in with great force, and after that date there was scarcely any day without some heavy showers. The atmosphere became more and more saturated with moisture, the nights became cool, and the thermometer stood sometimes as low as 75° towards the morning, rising at midday to 80 and 81°. The temperature was commonly 82 to 84° at 1 P. M., but it rose quickly to 90 and 91° whenever a few hours of sunshine prevailed.

In June the rains became heavier, and thunderstorms were frequent at all hours of the day. The saturation of the atmosphere was then great. The temperature at about 6 A. M. generally was as low as 74°, but often only 73° or even 72°, rising to 82 and 83° at 1 P. M., and sinking to 78 and 79° during the night. In the latter half of this month the heat increased, the thermometer indicating a mean height of 80.7° in the mornings, 83.7° at midday, and 81.1° in the evening. The showers during May and June were rarely of long duration, but came abruptly with great force at short intervals. I counted during 12 hours of daylight on the 18th June not less than seven heavy showers.

In the first half of July the heavy rains ceased, and several fine but cloudy days occurred alternately with rainy ones. The temperature decreased to 78.9° in the morning, 82.0° at midday, and 80.6° in the evening; during the night I observed the thermometer to fall as low as 78.3°.

I was informed that this weather continues till the latter half of December, when the rains become lighter, though they occur from time to time even in January and February.

If this statement is correct, the dry season, therefore, would comprise only four months. I was also told that, since clearings have been effected, the commencement of the rainy season has been retarded for nearly half a month.

It would be highly interesting if the meteorological observations made by the Medical Officers in the Andamans were made public, as our knowledge of the meteorology of these Islands is very imperfect.

The following Table shows some of my thermometrical observations; the remainder of which, I am sorry to state, has been lost by accident:—

Months.	6 P. M.	1 P. M.	8 P. M.	Night.	
28th May	73	...	...	...	Heavy rain.
30th "	77	81.5	...	...
15th June	78.0	81.0	...	...	Ditto.
16th "	77.0	82.5	...	...
17th "	81.5	82.5	81.5	...	Ditto.
18th "	79.0	85.0	80.3	...	
19th "	81.5	83.5	77.1	...	Ditto.
20th "	80.0	...	...	...
21st "	83.0	85.5	83.5	...	Heavy rain at midday.
22nd "	82.0	81.0	77.0	...	
23rd "	79.2	89.5	81.2	...	Heavy rain.
24th "	81.0	85.0	83.0	...	
25th "	82.2	81.4	83.5	...	A little rain only.
26th "	80.6	85.0	...	...
27th "	82.2	...	...	...	Some showers during night.
28th "	...	...	...	...
29th "	81.2	77.8	...	...	Ditto.
30th "	79.8	85.0	...	...
Mean	87.7	83.7	81.1	82.8	Rain and south-west wind prevailing.
1st July	83.0	...	...	...	Rather fine weather.
2nd "	79.5	85.0	81.2	...	
3rd "	81.5	...	...	...	Rain.
4th "	82.2	...	...	...
5th "	...	85.0	82.1	...	Rather fine weather.
6th "	...	...	...	...
7th "	80.0	78.0	79.5	...	A few heavy showers.
8th "	72.8	89.0	79.0	...	
9th "	78.2	79.5	79.8	...	Fine weather.
10th "	...	...	...	...
11th "	78.2	82.8	78.2	79.0	Rain.
12th "	78.2	83.3	79.5	77.8	
Mean	78.9	82.0	80.6	78.3	Cloudy, but fine weather.

Alternately fine days, south-west wind prevailing.

11. When sailing along the eastern coasts of South Andaman, the Island appears as a series of low hills, nowhere higher than 1,200 feet, and covered with dense lofty forests. All the trees show straight stems with a mean height of 100 feet, and often entirely covered by climbing plants, which hang from summits of the trees like gigantic festoons. Amongst these lianes *Durochloa Tjanqkorreh*, *Eutada Purshaeta*, *Calamus* and *Dischidia nummularia* may be recognised. The straight growth of trees disappears, however, south of S. Corbyn's Cove and along the western coasts, where a more stunted vegetation occurs,—the mean height of the vegetation being about 80 feet. Along the last named locality, the trees show some tendency to bend in conformity with the direction of the south-west monsoon. The verdure, however, appeared to me brighter there. Long tracts can be observed with deciduous trees; such trees, however, can be detected everywhere in the ever green forests. These deprive the landscape during the dry season of that tropical verdure which prevails during the rains.

Mangrove swamps, in which *Rhizophora* and *Ceriops*, with their green lurid foliage distinguish themselves, fringe all the little bays and straits. *Phœnix paludosa* is a characteristic feature along Middle Straits, *Barringtonia* and *Excoecaria Agallocha* are easily recognised by their red decaying leaves during June and July, also *Lagerstroemia* and *Pterocarpus* by their rich lilac or yellow blossoms. *Mussaenda*, with its snow-white calyx segment, is frequently seen.

A large *Crinum*, with broad leaves, appears everywhere along the sandy shores, and resembles in habit small plantain trees. In some spots arborescent *Euphorbiaceæ* occur, and present a strange appearance. *Screupines* and a *Cycas* of considerable height give a strange character to the whole vegetation, reminding us of earlier geological epochs. Most varied tints of green can be noticed everywhere in the forest masses, and prepare us to expect a most luxuriant and rich Flora, which, however, is fully developed only during the rains.

12. The Andaman Islands present much variety of soil and formation, and there is accordingly a corresponding diversity of the vegetation. It is, therefore, necessary to divide the whole into a number of zones and districts, and to treat of the vegetation of these separately. The absolute height above the sea, being inconsiderable, does not sufficiently influence the vegetation to necessitate special consideration here. Thus we have to consider the following six divisions only:—

- 1.—The vegetation of the shores.
- 2.—" of the coasts.
- 3.—" of the central forests.
- 4.—" of the woodless spots.
- 5.—" of the cleared lands.
- 6.—" of the sea.

13. The real vegetation of the shores extends nowhere further inland than half a mile, though some exceptions may take place along the courses of the numerous creeks, which are nearly all bordered by sandy beach of greater or less extent and a fringe of mangrove jungles. The vegetation of the shores is intersected by coast vegetation, wherever the hills slope steeply into the sea.

No *Salsolaceæ*, or similar strictly saline plants, have been observed by me in this shore vegetation.

The mangrove vegetation, which is especially developed at Mangrove Bay, Flat Shallows and along Middle Straits, extends furthest into the sea. The species which form these swamps are nearly exclusively at one place *Bruguiera gymnorhiza*, at another *Rhizophora mucronata*, and *conjugata*, with *Ceriops Candolleana*. These last three kinds advance furthest into the sea, and appear as a low dense hedge, fringing the shores with their vivid green leaves, and are often accompanied by the glaucous looking *Sonneratia acida*, and *apetala*; *Bruguiera* establishes itself behind these, becoming higher and

stronger as it occurs farther from the sea, until it attains its highest perfection where fresh water influences its growth. There the trees attain the unusual height of 70 to 80 feet, with a girth of upwards of eight feet. *Cacapa obovata* is the most curious tree amongst these Mangroves, and to be seen nearly everywhere, often quite covered with the still more curious *Hydrophyllum javanicum*, the tubers of which sometimes attain an enormous size.

Orchids are most developed in this region; amongst them deserve notice for their frequency *Eria Kureii*, *Phalidota imbricata*, *Dendrobium cruentatum*, *Oxytophyllum*, *Cleisostoma*, *Cirrhopetalum Andersonii*, and *Bolbophyllum*.

A *Dischidia* and a *Hoya* are nearly the only predominant climbers here, A few mosses and *Jungermanniaceae*, as also a great number of cortical Lichens, sometimes cover the rough bark of the trees.

In most places no other trees are seen growing with these Mangroves; but in others, chiefly along the borders of the swamps, *Alcoceras majus*, *Arceutha tomentosa*, *Sonneratia acida* and *apetala*, *Lumnitzera racemosa*, *Scyphophora hydrophyllacea*, and some others may be met with. *Avicetichum aurovum* occurs here in great abundance. A coarse glaucous *Cyperus*, *Acanthus ilioifolius* and *A. chraetoatus* are about the only phenorogamic perennials I observed actually in the swamps.

Along Middle Straits, on both shores, *Phoenix paludosa* and *Licuala paludosa* make their appearance unexpectedly, and in great abundance. These palms grow there sometimes amongst the *Rhizophora*, though their natural station is behind them. Here also a coarse new *Fimbristylis* (*Fimb. Antanayica*) is very abundant, but I found it nowhere else on these Islands.

Bordering the Mangrove swamps (but along a great part of these Islands directly bordering the sea, where Mangroves do not grow from the steepness of the shores) a small zone of shore vegetation appears, which may be briefly designated a beach vegetation. This is confined to places where loose sand and rubbish of corals have been washed out by the sea, forming small beaches along the coast.

The principal vegetable forms in these regions are *Thespesia populnea*, *Hibiscus ilioceus*, *Pisonia glabra*, *Erythrina Indica*, *Gaillardia speciosa*, *Hecitiera littoralis*, *Dalbergia sp.*, *Jambosa*, and *Pandanus verus* in abundance, and *Cycas Rumphii* occasionally, several white-flowered species of *Pavetta*, *Intsia*, *Cynometra bijuga*, *Peltophorum ferrugineum*, *Nipa fruticosa* along the courses of the creeks; *Barringtonia speciosa*, *Mimusops Indica* in stunted specimens, and *Catophyllum Inophyllum* sometimes of enormous size. Besides these and others, a few leafless stunted trees were visible, which I was unable to recognise.

Eccocaria Anallocha presents sometimes a peculiar appearance, with its red colored deciduous leaves, especially along the muddy creek on Middle Andaman, and occurs some miles distant from the sea. Shrubs of *Atlantia monophylla* with two species of *Capparis* occur, preferring situations where a rocky soil is prevalent; *Scaevola Knightii* can easily be recognised by its yellowish green leaves. *Calubrina Asiatica* and *Guitandina Banduc*, as also *Casalpinia nuga* are troublesome thorny shrubs.

South of Carhyu's Cove arborescent *Euphorbias* (*E. trigona* and *epiphyllaloides*) give a strange aspect to the character of the vegetation.

Ipomoea complanata, *Calamus*, *Asparagus*, *Mucuna gigantea*, several kinds of *Ficus* and *Enlodo Purshata* are the climbing species I chiefly observed here.

A *Cinnam* (*C. tovicartum*) is common all along the coast. A composite (*Pollastonia scabruscula*) is the only herbaceous plant, it covers the surrounding shrubs in great abundance. *Eranthemum album* and *Dactyloctenium* occur very frequently, but seem only descended from the more inland regions.

Near the sea on, the whitish sand, patches of a coarse creeping grass (*Lechnium muticum*) and some creeping *Phragmitoid* grass are frequently

met with *Ipomoea pes capra* is a remarkable feature, with its shining dark green leaves.

The species of epiphytic plants are not so numerous in this region, and are restricted nearly to the genera *Aschmannus*, *Dischidia*, and *Hoya*. A few orchids, as *Cleisostoma*, *Naucalabium* with *Dendrobium cruentatum* occur. *Polypodium quercifolium* covers in great profusion the branches of the trees which are standing near the sea, and is often accompanied by several orchids. No palms occur here, except a few *Galami*.

14. Another vegetation now presents itself behind this zone of the shores, and is rather less monotonous in character, owing to the diversity of the surface and of the soil. This is the vegetation of the slopes of the hills and valleys influenced by the sea.

It is, so to say, a combination of the flora of the interior parts and of the shore-vegetation favored by the greater moisture, so that here plants may be found which until now are known only from more southern parts of India, as *Freyinetia*, *Anacardora*, *Drochloa*, &c. The greatest variety of species is found in this zone. Here I had always the most favorable botanical harvests during May and June; and whenever I penetrated to the interior, I scarcely could find any species except herbaceous plants and shrubs which I had not seen already in this region.

This coast vegetation may range from three to four miles in breadth, but nowhere can any real limits be traced here. There is also no uniformity in the character of these forests themselves along their whole extension, but they change as soil and surface become different. To treat of them more easily, they may be brought under the three following heads:—

- A.—Evergreen forests,
- B.—Deciduous forests,
- C.—Bamboo jungles.

In the following pages I shall try to give as correct a picture of these several forests as the short period of my stay allowed me to observe them. I must remark, however, that such forests are not always so strictly separated in nature. Many tracts may be found where deciduous and evergreen forests are growing nearly equally mixed together, or even intersected by bamboo jungles. This, however, does not diminish the value of my proposed classification.

The evergreen forests are most extensive on these Islands. Trees, however, exist in such a quantity in all the valleys bordering the sea, that I am obliged to treat these evergreen forests under two separate divisions. These are—

- (1.)—The Kuppalee forests.
- (2.)—The mixed forests.

(1.) The Kuppalee forests occupy nearly all the mouths of the creeks and the level lands along the coasts behind the beach as the Mangrove swamps. They consist in some places nearly exclusively of *Mimusops Indica* (called Kuppalee-theet, the Burman's tree of the Andamanese), which is a tree ranging from 70 to 80 feet, by a girth of 12 to 14 feet, and growing up as straight as a *Dipterocarpus*. The finest forests of this species are along the western coasts at the Labyrinth Islands and at Macpherson's Straits. *Catophyllum Inophyllum*, and *Hernandia*, and also *Macaranga Indica* often associate themselves, and a few other kinds of the surrounding forest trees occur in a less number. *Hemicycelia Andamanica* is often associated (as at Macpherson's Straits) in a nearly equal proportion with the Kuppalee trees. Such forests are rather free from all kinds of climbers, and the prickly canes (*Calami*) occur only along their margins.

(2.) The tropical mixed forests now begin around these forests, but they also commence immediately beyond the seashore zone where the ridges are distant. Here it is that the traveller has the most difficulty in forcing his way, from the great number of climbers. The typical tree is *Dipterocarpus levis*,

after which follow as the principal trees of these forests, but prevailing in one locality more than in another, *Dipterocarpus alatus*, *Mesua ferrea*, *Lagerstræmia hypoleuca*, *Pterocarpus dalbergioides*, *Trinia glabra*; and another species, *Dracontomelum pubescens*, *Albizia elata*, *Adenanthera Pavonina*, *Podocarpus polystachya*, *Eriolena aceroides*, *Rottlera tinctoria*; two and three kinds of *Calophyllum*, *Ficus laccifera*, *Spondias*, *Careya sphaerica*, *Barringtonia*, *Artocarpus Chaplasha*, *Fagraea morindefolia*, *Vitex leucocylon*, &c., &c.

There often appears a group of leafless *Bombax Malabaricum*, "Memborôh" and some other deciduous trees.

Along the western parts of South Andaman, *Harpullia cupanioides* (of a large size), *Eleocharis Helferi*, *Walsura*, and numerous species of *Ficus* prevail, owing to the greater moisture.

Under the protection of these lofty trees smaller trees occur in great abundance, amongst which the following deserve notice for their frequency:—Three to four kinds of *Myristica*, the delicate *Baccaurea sapida*; three species of Araliaceous trees, *Mangifera sylvatica*; two kinds of *Pisonia*; two arborescent *Cordylines*, *Pandanus Leram*, *Polyalthia Parceana*; several *Tetratherae*; and *Euphorbiaceae*, *Garcinia*; a large flowered *Mussaenda*; and a number of other Rubiaceaceous trees.

The shrubby underwood is rather dense, but all these shrubs look very weak and slender, showing a tendency to run up. It is difficult to classify them under any general description, but I shall have an opportunity hereafter to call attention to the presence among them of botanical centres of particular species.

The most frequent forms, however, which are present in all parts of these Islands are *Claoxylon*, *Rottlera*, *Glycosmis pentaphylla*, *Jambosa*, *Eriocarpus orientalis*, *Ardisia*, *Alsodeia Bengalensis*, *Unona longiflora*, *Anaxagorea Zeylanica*, *Paderia ternata*, several white flowered *Parlette*, *Croton umbellatum*, *Maereghtia oblongifolia*, *Grunitea elongata*, and several others.

The prevalence of *Anonaceae*, *Rubiaceae*, and *Euphorbiaceae*, though varying very much with regard to species, is so marked, that we might fairly estimate two-thirds of the whole shrubby vegetation to consist of these families.

The climbing vegetation comprises, in the first place, *Dirochloa Tjankorreh*; three kinds of formidably armed canes, *Ficus*; several species of *Vitis*, *Taunbergia laurifolia*; a thorned *Griffithia*, *Ucaria Sumatrana*, *Toddalia sp.*, *Zizyphus scandens*; several kinds of *Menispermaceae*; two species of *Scindapsus*, *Uncaria pilosa*, *Freycinetia radicans*, *Medecca*, *Ancistrocladus extensus*, *Buettneria*, *Copparis*; several *Cucurbitaceae*, *Brachypterum scandens*, *Eutada Pursuaetha*, *Flagellaria Indica*, *Chavica*, *Gnetum scandens*, &c., &c. In general, it seems that nearly every family has its representatives among these climbers, which make some parts of the Islands, especially along the ridges, nearly impenetrable.

Epiphytical orchids are rather rare in these forests, and are mostly confined to the upper parts of the trees.

Palms are numerous; amongst which *Licuala peltata* and *Areca triandra* are the commonest. On Termooklee Island a gigantic but stemless *Corypha*, with leaves nearly 30 feet long, presents a most striking appearance.

The herbaceous annual and perennial vegetation is, during the dry season, exceedingly scanty, and nearly confined to a dozen species: *Brugantia tomentosa*, *Abrus precatorius*, *Eranthemum album*, *Dædalacanthus suffruticosus*, *Hemiographis glutinosa*, *Hypolytrum*, *Cyperus moestus* and *Pandanophyllum zeylanicum*, are the most remarkable ones; *Elatostemma sesquifolium* and *Maranta Indica* are often seen.

Musa (Simiarum?) *Anorphophallus longistylus*, *Alocasia fornicata*, *Phrynium parviflorum*, and another small species, *Costus speciosus*, *Anomum aculeatum*, *Zingiber cassumunar*, *Curcuma Rosaceana*; several terrestrial orchids, *Aclisia Indica*, *Aseilema oatum*, *Ophiorrhiza*, *Ophioryzylon*, and some others, appear principally during the rains.

The only real annuals during the dry season are *Urena lobata*, *Blumea vitens* and *Blumea myriocephala*, which, however, are too rare to need consideration here. The soil during this season is everywhere exposed, and looks quite barren along the eastern coasts, where few plants, except seedlings of the surrounding trees, are found.

During the hot season tracts of forests may be observed principally along the coasts, which are quite leafless, and, therefore, presenting a greyish sterile aspect. They consist,

for the greatest part, of large sized and straight trees, mostly of small utility. The principal species, which more or less prevail, are *Bombax Malabaricum* in abundance; several kinds of *Sterculia*, *Nauclea sp. Odina wodier*, *Calosanthus Indica*, *Pajanelia bijuga*, plentiful *Terminalia procera* and *biolata*, *Albizia elata* common; *Ficus infectoria* rare, *Gyrocarpus Asiaticus*, *Canarium euphyllum*, *Cordia sp.*, and others.

In June, when all these trees begin to put out their leaves, such forests are still peculiar in their aspect from the different tints of brown, yellow and red which are produced by their young leaves. Later in the season the trees may be recognised by their hemispherical large crowns, and the bright green of their foliage. Owing to the little shade they give during the hot season, climbers are much scarcer in these forests, and even disappear altogether in some localities; the shrubs are confined to a small number of wide range, and the herbaceous plants are reduced nearly to *Eranthemum*, and sometimes *Dædalacanthus* and *Bragantia*. No climbing *Aroidæ* grow here save *Pothos scandens* in a stunted condition.

During the rains, however, and especially along the western coasts, a number of small herbs, as *Begonia Andamanensis*, *Ebermayera velutina*, *Leea*, *ophiorhiza*, &c., develop themselves.

Here and there some evergreen tree may be observed belonging to *Sapindaceae*, or even *Dipterocarpeae*; also *Artocarpus chaplasha*, *Ficus laccifera*, and *Erioglossum edule* are not uncommon.

The immense buttressing of the stems is noteworthy. Trees of 12 feet girth, a short distance above the ground, may have a girth of nearly 40 feet near the surface of the ground.

Such deciduous forests occur principally south of South Corbyn's Cove, north of Chatham Island, at Mangrove Bay, around Port Mouat, and in greater extent at Shoal Bay and on Middle Andaman.

The bamboo jungles occupy principally both shores of Middle Straits, the lands north of Watering Cove, Shoal Bay, &c., only here or there interrupted by forests of the other classes. They occur, however, in all parts of South Andaman and Labyrinth Archipelago to a greater or less extent.

It is highly interesting to observe the connection of the bamboo jungles with the indurated chloritic rocks. I observed everywhere on these Islands that, wherever bamboo jungles exclusively covered tracts of land, I could conclude with certainty that chloritic rock or serpentine was present, often only indicated by the many quartz pebbles in the soil.

The mean height of these bamboos may be about 30 to 35 feet, and they consist nearly entirely of a single species, *Bambusa Andamanica*.

They are very easy to penetrate, as climbers and shrubs are comparatively scarce. Lofty forest trees occur only at great distances from each other (on an average perhaps from 90 to 100 feet), and belong generally to the same species as of the other forests, *Dillenia aurea*, *Careya sphaerica*; several *Acacias*, *Pterocarpus dalbergioides*, are those which I noted as most abundant.

All these trees, when seen afar from the sea, stand out from the bamboos like slender palm trees from a low jungle.

In these bamboo thickets *Scleria lithosperma* occurs abundantly in some places, *Pteroloma triquetrum*, *Geophila*, *Elatostemma sesquifolium* and several *Scitamineae* are frequently met with.

The bamboo itself which forms these jungles is very variable as to size and habit, and nearly useless, the wood being very thin and soon decaying. A larger kind of bamboo will probably be found south of South Corbyn's Cove, with culms nearly six inches in diameter, and of somewhat stronger quality. I myself, however, did not come across the growing plant; and I became aware of the existence of this species only from pieces of bamboo which I found occasionally around the camping places of the Andamanese.

15. After having penetrated through these coast zones, we see the quantity of intricate climbers diminishing, and a greater uniformity of the vegetation appearing.—the luxuriance, however, remains nearly the same. The whole of this central region remains still a *terra incognita*, as I entered it for a few hours only.

The chief trees observed there were *Dipterocarpus laevis*; *Dracontomelum*, two species of *Trinia*, *Walsura* sp., *Ternstroemia penangiana*, *Bassia colorata*, *Artocarpus chaplasha* and *Melia tomentosa*; also *Garcinia*, *Mangifera*, *Myristica* and *Hurroya caribica* appeared most common. The principal shrubs were chiefly *Asodeia Bengalensis*, *Uncaria longiflora*, *Grumilex elongata*, and another hairy species, but the preponderance of the various species changes, even as in the other regions, with every mile of progress.

The climbers were principally *Dirochloa Tynghorrek*, and several species of *Vitis*; *Calamus* appeared less prickly, and only on some spots formed really impenetrable masses.

Pandanaphyllium Zeylanicum, *Hypolytrina*, *Eranthemum album*, *Bragantia tomentosa*, *Clerodendron*, some dried up *Acanthaceae*, several terrestrial *Orchideae*, *Scitamineae* and *Musa* appeared most frequently. Epiphytical orchids are rare here; Aroidae are, however, frequent. *Asplenium nidus* is the most common species on the trees, as *Acrostichum setosum* is on the ground.

In the interior parts, north of Port Blair, bamboo seems to form the most extensive jungles, and to form a broad strip, interrupted occasionally by other jungles extending from the centre in a north-north-east direction to Middle Andaman, following the formation of the chloritic rocks.

16. The woodless spots are confined on South Andaman to Bird Islands near Viper and to the Bird-nest Cape at the entrance to Macpherson's Straits. There treeless rocks rise abruptly from the sea nearly vertically, and are completely exposed to the influence of wind and weather, so that only shrubs and perennial plants can sustain themselves along the barren precipices, which are nearly destitute of humus even on the ridges.

The vegetation there (in May), however, was nearly quite burnt up by the scorching sun, and the whole appeared thorny, rugged, and of a brownish color. I could recognise only a few species when I passed this place, endeavoring to save my life after being stripped of every thing by the robbers who attacked me.

A *Fimbristylis*, with narrow stiff leaves, is common there, especially near the sea; also two or three *Andropogonous* grasses, which formed extended patches; some of these are prostrate grasses measuring two or three feet in length. *Pleocarpus spinosum*, *Harrisionia Bronnii* (?), *Coparris sepriaria*, *Alantia monophylla*, and a number of half-withered leafless shrubs appeared upon the rocks.

The large number of orange-red fruits of *Trichosanthes palmata* produce a most agreeable effect on Bird Island, and look like a number of bright balls hanging from the rocks; at this place a coarse *Cyperus* is also common.

Barren Island, which I did not visit, belongs partially to this section. As I observed the grasses occurring on it, which were brought by the deputation sent from Port Blair to search for pasture ground or wild grasses, belonged to *Andropogonous* genera. As these were the only plants collected there by the deputation, I cannot judge of the general character of the vegetation of that Island.

17. We have now to consider the vegetation of the cleared spots and cultivated lands where the most recent change in the Flora of the Andamans has occurred.

Vegetation of the cleared lands.

Such spots appear during the hot season as yellowish ridges, destitute of nearly any vegetation, except what is the direct result of cultivation. During the rains, however, and even in some protected spots also during the hot season, a number of weeds spring up, which have been introduced with the different sowings of grass made around the Settlements. *Stachytarpha Indica* and *Angelonia salicariaefolia* have become troublesome weeds on Ross Island; *Scoparia daleis*, *Vernonia cinerea* and *Aperatum conyzoides* are now the most common weeds in these Settlements, and some of them have already penetrated far into the jungles, especially wherever a little clearing or even cutting has taken place; numerous grasses and *Cyperaceae* are growing now freely, which originally had been sown, and in some spots in the forests they appear as if wild. *Cynodon Dactylon*, the common doob grass, is springing up vigorously, covering the ridges with a thin but brilliant emerald green. A shrub, *Lantana mixta*, already occurs locally in the jungles around Aberdeen. *Papaya vulgaris* will most likely become in a short time quite established, and will spread spontaneously.

18. Omitting the vegetation of fresh waters, which in the Andamans only is represented by a few Algae,

Vegetation of the sea.

we have finally to note the vegetation of the sea. The only phanerogamous plant I observed was *Palms Kenigii*, which is rather common along the western coasts and the Labyrinth Islands.

19. I must here notice the difference of the aspect of these forests and cultivated lands in the latter part of the dry season (April and May), and during the rains (June and July).

Influence of the seasons upon the vegetation.

I have already dwelt generally upon this subject in the previous Sections on the vegetation of these Islands.

In April and May we find few other species in flower than such as have more or less a continental geographical distribution as *Sterculia*, *Albizia elata*, *Pajanelia*, *Dillenia*, *Careya*, *Odina*, *Glycosmis*, &c., also generally such as are destitute of their leaves during the hot season. The climbers put forth all their variously colored flowers high in the summits of the trees, quite out of the reach of man. Numerous dried-up perennial and annual plants and leafless (often thorny) shrubs fail to give the forests the appearance of tropical luxuriance.

The shrubs, though numerous, appear of such an uniform habit in consequence of the prevalence only of a few families, that those not acquainted with botany might easily refer them altogether to some 20 or 30 kinds. Only a few produce conspicuous flowers.

A fortnight or so after the rains have set in a new life begins, the former leafless trees appear in bright green, the numerous pinnated leaved trees, belonging to *Sapindaceae*, *Meliaceae*, *Burseraceae*, *Anacardiaceae*, and numerous families of a more southern vegetation, all vie to be the first to develop their buds. The herbaceous plants, formerly nearly disappearing from drought, occasionally cover in single or few species the freshly moistened soil. *Siamenaceae* form now the principal feature, intermingled with *Pollia*, *Leca*, *Ophiorrhiza*, &c.

All vegetation takes a more Malayan type, and we often do not recognise again the spots which we passed during the dry season, when they were nearly barren and the yellow clay soil was covered only with dust.

Such a change, however, is not only confined to the Flora, but affects also the Fauna. Frogs and toads are now croaking; snakes appear more numerous; snails are plentiful on the wet stems and leaves; fire-flies, before nowhere seen, appear, though in a moderate number, giving a dusky light, and cicadas loudly chirp. But a swarm of pests accompany this delightful change, and whole hosts of musquitos, horse-flies, gnats, sand-flies, &c., in company with leeches, abound.

20. The botanical features, as given above, evidently show that the character of the Andaman Flora is a Burmese one, altered by some unfavourable agencies, principally the scarcity of running waters; and favored at the same time by its insular position and narrowness, a number of Malayan types grow here, which are not yet recorded from the opposite continent.

I had only a few minutes' stay at Diamond Island in Pegu; but I was struck, when afterwards coming to the Andamans, by the similarity, nay rather identity, of the shore vegetation. A few Ceylon species indicate some relation between the Andamans and that Island. Most of the species, as far as I have been able to collect, do not differ from those already known from the Burmese territory (principally Tenasserim), or which are preserved unpublished in the Herbarium in the Botanical Gardens, Calcutta.

21. The peculiarities of the Flora do not consist in the presence of many new and rare species, but rather in the absence of well known, and in the surrounding countries exceedingly common, forms. As examples, I may quote *Saccharum spontaneum*, *Impatiens acuminata*, *Vernonia cinerea*, *Gleichenia dichotoma*; most species of *Cordia*, *Blechnum orientale*, *Lycopodium complanatum*, *Schizanthus*, *Hydrocotyle Asiatica*, *Notolera*, *Kalybia*, *Pterosporium semisagittatum*, *Quercus*, *Croton*, *Indigofera*, and numerous others.

The disproportion between the genera and species in favor of the former is another fact worthy of mention, though it may happen that this inequality may be greatly reduced after the whole of the Islands have been thoroughly explored. Already, after the first rains had set in, a number of species could be referred to genera which appeared to me during the dry season to consist of but a single species.

The astonishing profusion of individuals of single species, though not so evident when visiting only a few localities, is another fact deserving mention. Nearly two-thirds of all the species enumerated in my list occur in one or other locality in great numbers; comparatively few have been observed as single plants only, perhaps because I had not reached their centres.

As the most important deficiencies in the Flora of the Andaman Islands in comparison with the Burmese one, of which it must be considered to form part of, I may sum up—

(1).—Total absence of Magnoliaceae, Polygalaceae, Rosaceae, Onagraceae, Umbelliferae, Vacciniaceae, Antirrhinaceae, Labiatae, Polygonaceae, Amaranthaceae, Salsolaceae, Cupuliferae, Coniferae, Pontederiaceae, Hypoxidaceae, and a number of smaller families.

(2).—The absence of Nymphaeaceae, Haloragaceae, Lentibulariaceae, Najadaceae, Lemnaceae, Hydropteridaceae, Ricciaceae, and all other fresh water plants is in accordance with the scarcity of water during the dry season.

It would be important to determine whether during the latter part of the rainy season short-lived water-plants would not spring up, as I observed already in July fine patches of fresh water Algae in the creeks north of Watering Cove.

(3).—The scarcity of Melastomaceae (2 sp.), Tiliaceae, Solanaceae (1 sp.), Urticaceae (1 sp.), Ternstroemiaceae (1 sp.), Begoniaceae, (1 sp.) Piperaceae Aroidae and Aspidiaceae.

(4).—The extreme scarcity of annual plants, and of so called weeds, beyond Port Blair, is undoubtedly a most remarkable feature in the Andamanese Flora.

All the weeds enumerated in my list are evidently of late introduction, and, therefore, cannot be treated as elements of the Flora. Wherever clearings take place, the soil remains barren, and only Acanthaceae, shrubs and other woody plants come up, with which *Vitis*, *Leca*, &c., are associated during the rains.

Scarcely any indigenous weeds are seen on such spots, but numerous introduced weeds appear in localities which are protected, or in the valleys; amongst these *Scoparia dulcis*, *Ageratum conyzoides*, *Vernonia cinerea*, and several *Cyperaceae* occupy the first place.

The great number of introduced plants already appearing almost indigenous, in spite of the short time of our occupation, will be easily understood when we recollect that extensive sowings of grasses, &c., have been made all around the stations within the last few years, so that the originally barren yellowish ground is covered with an agreeable verdure during the rains. When drawing our attention from the deficiencies, and directing it to those forms quite peculiar to the Islands, and to those families best represented there, we perceive that, with regard to the latter, the Andamanese Flora has but little peculiarity in comparison with the Burmese and Malayan Floras.

As a few examples of apparently peculiar forms in the Andamans, but not yet known from Burmah, I can note *Freylinia*, *Mimosa Indica*, *Anacardium Zeylanicum*, *Microrhiza oblongifolia*, *Hydrophyllum formosum*, and a number of the species, now described by me as new. But even those forms cannot certainly be pronounced peculiar, as I feel sure that many of them will be collected in Burmah at some future time; moreover, the Burmans in the Andamans know most of them by name.

22. It is important to know the Flora of the Andaman Islands in all its completeness as soon as possible, as the increasing clearings and subsequent cultivations have already caused a number of introduced plants to become as if they were indigenous, so that it is only possible to declare a species really introduced after having explored the surrounding regions.

All our inquiries into the laws of distribution of plants depend chiefly upon the knowledge of unmixed Floras, and the Andamanese vegetation is probably the only unmixed one existing in tropical Asia.

I may remark here that Mr. Homfrey himself has informed me that he has made many sowings of different species, as *Canna*, *Mirabilis*, &c., in the interior of the jungles.

23. A considerable number of plants appear on the Andamans concentrated on one or more spots, where they occur in great abundance, diminishing in number of individuals, or disappearing altogether as we remove from their centres. Such spots may be called botanical centres of species.

A species may, therefore, occur in great quantity over a certain space, but be found nowhere else. In other instances, a species may occur at a spot in great quantity and disappear to make place for another prevailing type, but it may make its appearance again under similar circumstances at some other spot.

Such centres are especially well marked in perennial and herbaceous plants, somewhat also in shrubs, but in trees less so, though among them similar laws must be in force, when we consider the great variance in the prevailing types in the different localities.

I was long inclined to ascribe these changes to the different soil, but afterwards I became convinced that this was not the sole cause, though it cannot be denied that the influence of the different geological formations on the limits of the centres is a very marked one everywhere.

The whole Flora of the Andamans, therefore, must be a very primary one, and could never have been influenced by the agency of man. Malayan crops come during the north-east monsoon for fishing and catching trepangs, and might have accidentally introduced a certain number of plants along the sea shores, but I saw no evidence of such a fact.

Around Port Blair and the Penal Stations, where clearing of the jungles and cultivation have taken place, we may observe similar but smaller centres of

In considering this apparently gradual diminution of species towards the interior, together with the sinking state of the Islands, I am inclined to ascribe the profusion of species along the shore and in the coast zone to a gradual and slow retirement of the different species towards the interior. We may presume that a great number of species, which originally grew on the countries now submerged between these Islands, Burmah and Hindostan, have been repelled by the advancing sea, and the vegetation became thus comparatively richer in generic types as the area grew smaller.

Hundreds of species may have been extinguished by this struggle against the sea and subsequent change of climate, or may have been superseded by more durable ones. The great scarcity of perennial and annuals might have originated by the gradual diminution of fresh water as the sea reached the higher ridges of the mountains now submerged.

In Middle Straits, where I already noted that the sinking of the land is well marked, we are enabled at some places to see how the bench vegetation, now submerged but still recognizable, has retired behind the Mangrove formation. North and north-west of Mangrove Bay the gradual trans-formation of the low lands into Mangrove swamps can be easily studied, as also the interesting struggle of non-swamp species against the swamps, and their retirement towards the drier forests. It is not in the power of a traveller to give accurate statistics of such changes, but such investigations must be carried out by local botanists, who are enabled to follow the changes of the vegetation on a tract of land during a long series of years.

25. The number of Phanerogamic plants noted by me as really indigenous is only 620 species. This, however, is only an approximation to the actual number existing on the Islands.

The number of species on a square of 100 feet, in a favorable situation in the interior, east from Aberdeen in May was only 65 to 70, with the following proportions:—

A.—Trees.		
Number of species.		Number of Individuals.
1. <i>Dioscoreopsis toria</i>	111	111
2. <i>Pisonia</i> (Plungen plant)	111	111
3. <i>Wrightsonia</i> <i>collyria</i>	111	111
4. <i>Peucea</i> <i>maritima</i>	111	111
5. <i>Leptocarpus</i> sp. (Kiss-phye)	111	111
6. <i>Massa</i> <i>terre</i>	111	111
7. <i>Carolinia</i> <i>caudata</i>	111	111
8. <i>Alstonia</i> <i>fluviatilis</i>	111	111
10. <i>Myrtilus</i> <i>laxa</i>	111	111
11. <i>Alphitonia</i> <i>solidata</i>	111	111
12. <i>Myrsine</i> <i>serotina</i>	111	111
13. <i>Myrsine</i> <i>laetitia</i>	111	111
14. Three small trees not recognized	111	111

B.—Herbs.		
Number of species.		Number of Individuals.
1. <i>Mangrovea</i> <i>alternifolia</i>	111	111
2. <i>Ipomea</i> <i>batavica</i>	111	111
3. <i>Crotalaria</i> <i>torulosa</i>	111	111
4. <i>Portulaca</i> (Small white flowers)	111	111
5. <i>Stemodia</i> <i>obovata</i>	111	111
6. <i>Charitum</i> sp.	111	111
7. <i>Wrightsonia</i> sp.	111	111
8. <i>Synedrella</i> <i>pentachryla</i>	111	111
9. <i>Eleusine</i> <i>Wrightsonia</i>	111	111
10. <i>Portulaca</i>	111	111
11. <i>Stemodia</i> sp.	111	111
12. <i>Crotalaria</i> <i>torulosa</i>	111	111
13. <i>Stemodia</i> <i>obovata</i>	111	111
14. <i>Stemodia</i> <i>torulosa</i>	111	111
15. <i>Myrsine</i> <i>serotina</i>	111	111
16. <i>Leuca</i> <i>massingha</i>	111	111
17. Four species of herbs, not recognized	111	111

C.—Palms (except climbers).			
Number of species.			Number of Individuals.
1. <i>Areca</i> <i>lanceolata</i>	111	111	111
2. <i>Laccalnia</i> <i>palifera</i>	111	111	111
3. <i>Caryota</i> <i>schottiana</i>	111	111	111
			7

D.—Climbers, excluding annual species.			
Number of species.			
1. <i>Calanthe</i> with black thorns	111	111	predominating;
2. <i>Calanthe</i> (p. broad leaves)	111	111	rare.
3. <i>Calanthe</i> <i>formosa</i>	111	111	plentiful;
4. <i>Amantopodium</i> <i>extensum</i>	111	111	scarce.
5. <i>Polypodium</i> <i>scandens</i>	111	111	plentiful;
6. <i>Schlotheimia</i> <i>peruviana</i>	111	111	plentiful;
7. <i>Psychotria</i> <i>paniculata</i>	111	111	scarce.
8. <i>Psychotria</i> <i>paniculata</i>	111	111	plentiful;
9. <i>Psychotria</i> <i>paniculata</i>	111	111	predominating.
10. <i>Psychotria</i> <i>paniculata</i>	111	111	scarce.
11. <i>Psychotria</i> <i>paniculata</i>	111	111	scarce.
12. <i>Psychotria</i> <i>paniculata</i>	111	111	plentiful;
13. <i>Psychotria</i> sp.	111	111	scarce.
14. <i>Psychotria</i> <i>paniculata</i>	111	111	plentiful;
15. <i>Psychotria</i> <i>paniculata</i>	111	111	scarce.
16. <i>Psychotria</i> <i>paniculata</i>	111	111	plentiful;
17. About two or three species not recognized	111	111	scarce.

E.—Grasshills.			
Number of species.			
1. <i>Dactyloctenium</i> <i>truncatum</i>	111	111	few;

F.—Parental and Annual Plants.			
Number of species.			
1. A little climbing plant	111	111	plentiful.
2. <i>Hypocistis</i> <i>albiflora</i>	111	111	scarce.
3. <i>Centropogon</i> <i>truncatum</i>	111	111	plentiful.

The extension of such a calculation to the whole of the 900 square miles of South Andaman shows that that Island can scarcely contain more than 600 or 700 species. Travelling, however, from place to place, and taking into view the great change of vegetation and the numerous unexpected appearances of new forms with which we so frequently meet, the number of really indigenous Phanerogamic plants may range between 15 to 1,800 species.

A square of 100 feet on the western coast, when carefully taken up, would give quite other results from what I have just shown as the result of such an investigation in the eastern part.

26. Colonel Kyd, in 1791, introduced from the Andaman Islands (most probably from Port Cornwallis) several plants into the Botanical Gardens, Calcutta, which were described afterwards by Dr. Roxburgh in his Flora Indica. Dr. Helfer, when on detention on these Islands, made large botanical collections. He was, however, unfortunately killed by the natives; and his Andamanese collections were afterwards mixed up with his Tennessee plants. The greater part of his collections could not, therefore, be embodied in my list. A few plants have been gathered by Drs. Plancher and Lehm, most of which are contained in the Herbarium of the Royal Botanical Gardens, Calcutta. More recently in the year 1826, I believe, the Reverend G. Parish of Moulmein, visited Port Blair and collected plants, but I am unacquainted with his collections. My own collections, though far the richest, will probably be found to be very poor indeed, when the whole of the Flora is known.

27. Annexed Appendix B, is a list of the plants known from these Islands, including the Coles and the Native names as far as I could obtain them, and also remarks upon the occurrence of the several species, as I am

SKETCH MAP of SOUTH ANDAMAN and ADJACENT ISLANDS

SIGNS

- Route in the interior
 - Roads or Paths
 - Penal Stations
 - Flag Staff
 - Cape
 - Island
 - Creek
 - Safe landing for boats
 - Landing dangerous
- REMARKS: Along the streams and in the different bays an easy landing by boats is understood.

FORMATIONS.

- Sandstone
- In-situ of Chlorite rock
- Disposition rock
- Pure Serpentine
- Granite Rocks
- Conglomerate

