

there are in reality many varieties, and the finer ones will probably not be long in making their appearance. As to *O. Alexandræ*, though strictly speaking it belongs to 1865, still we could never have formed any idea of its real beauty until we had seen the specimens that Mr. PATERSON and Mr. ANDERSON sent during the past season from 'ayont the Tweed.' To this brigade also belong *Oncidium obovatum* and *O. serratum*, to which we shall shortly revert.

We cannot now dwell upon the multitude of small fry exhibited at one or other of the South Kensington gatherings, but of these Mr. WILSON SAUNDERS will give a good account in his forthcoming work, in which all such will find a permanent "Refuge." In the meantime the more gorgeous varieties of established favourites are worthily represented in Mr. WARNER'S "Select Orchidaceous Plants," of which we are glad to see a new series has been commenced. Another useful work, a "Second Century of Orchidaceous Plants" (a republication by REEVE & Co., in a popular form, of the best species figured in the "Botanical Magazine") is making rapid progress. The same publishers announce another part of Mr. BATEMAN'S "Monograph of Odontoglossum." Thus much for England; and if we look abroad we find that in addition to his more catholic "Xenia Orchidacea," Professor REICHENBACH has in the press, 'just ready,' a most important work on the "Orchids of Central America." So that what with new plants and new books, there seems but little fear that the Orchid-fire will soon burn itself out for lack of fuel.

We shall resume next week our comments on sundry other new plants of various kinds introduced in 1866.

AMONG the Evergreens that are annually in great request at this season of the year, there are none more ancient than the MISTLETO, and none with which so many pleasing incidents are associated. It is in itself a remarkable example of a true vegetable parasite, as it never grows like other plants in earth, but entirely depends for its nutriment and support on one or other of the numerous kinds of trees on which it is found—such as the Apple, Hawthorn, Lime, Sycamore, Poplar, Willow, Scots Fir, and occasionally the Oak. So rarely, however, is it met with growing on the latter, that it was at one time considered doubtful whether it had ever been seen on the Oak at all; but of late years several instances of the fact have been recorded, sufficient to place the question beyond dispute. In the time of the Druids this parasite was regarded with extreme veneration. The Celtic priests are said to have collected it for charms, and cures, and religious ceremonies with solemn formalities, when it was found growing on their sacred tree—the Oak; and to this latter circumstance it owed all its supposed mystic influences. Many of the early converts to Christianity in Britain, we doubt not, looked upon the Mistleto with reverence while they knelt and offered up their prayers amidst Pagan altars and hideous images; for although it hung above the heads of the idols, they knew it was not the work of the image maker, but a natural production of their own forests, that had sprung from the grey Oaks under which the Roman legions had marched, and was, perhaps, the only remnant of their idolatry—the only link between Christianity and Heathenism.

Besides being an object of worship, the Mistleto has been from a very early period highly extolled for its medicinal properties; and even so late as 1719, Sir JOHN COLBATCH, a member of the College of Physicians, wrote a treatise on "The Mistleto of the Oak," in which he says, "the plant has been designed for further and more important purposes than to feed thrushes, or to be hung up surreptitiously in houses to drive away evil spirits;" and he further adds, that "he has found it efficacious against epilepsy, chorea sancti viti, and other diseases of the nervous system." But after all that has been said about its reputed virtues, they were more imaginary than real, and it is now discarded from the Pharmacopœias.

Although the Mistleto failed to produce the wonderful effects that superstition or charlatanism had ascribed to it, still it was always considered perfectly harmless, and no one ever suspected that its tiny berries were likely to be swallowed by a human creature so as to destroy life. We regret to say, however, that its fair fame has been greatly sullied by a lamentable case which lately occurred in Duke Street,

Commercial Road, London, and of which the following particulars were given at the inquest. The victim was a child 15 months old, whom its mother placed in the care of its little sister, only six years old, to nurse. Whilst looking at a greengrocer's shop she picked up some Mistleto berries, fancying they were white Currants. Finding they tasted bitter, and not able to eat them herself, she unfortunately gave them to the baby until it became quite ill. As soon as the mother heard what had been done she sent for a doctor, who prescribed an emetic that caused the infant to throw up nearly a tea-cup full of the berries—but all efforts to save its life were of no avail, for after passing the night and part of the next day in extreme suffering, the little thing expired. The jury returned a verdict of "Accidentally poisoned by Mistleto berries."

This instance shows the great danger of committing an infant to the care of a young child who was not of an age to be intrusted with such a charge. *B.*

— Among ALMANACS specially useful to those taking an interest in garden matters, may be mentioned that of the Royal Horticultural Society just issued. It is of small size, but utility is not to be measured in this case by magnitude.

PLANT PORTRAITS.

[Under this head we propose to record the figures published from time to time in periodical or other works of such plants, flowers, or fruits as may be interesting to horticulturists.]

COMBRETUM MICROPETALUM.—*Bot. Mag.*, t. 5617. Combretaceæ. A magnificent stove climber, with opposite, oblong leaves, and axillary, spreading or refracted, unilateral racemes, 4 or 5 inches long, bearing crowded flowers having a green calyx, minute petals, and long yellow stamens with orange-coloured anthers. Native of Brazil. Flowered at Glasnevin, in a greenhouse.

CYPELLA CÆRULEA.—*Bot. Mag.*, t. 5612. Iridaceæ. A fine old stove herb, better known as *Marica cœrulea*. The fine handsomely-marked Iris-like flowers are supported on tall ensiform scapes, closely resembling the true leaves. Native of Brazil. Flowered at Kew.

CYPRIPEDIUM SCHLIMMII.—*Bot. Mag.*, t. 5614. Orchidaceæ. This is sometimes called *Selenipedium Schlimmii*. It is a pretty stove herb, with ligulate coriaceous leaves, and a tall, often branching stem, bearing about half a dozen rather small flowers, which are white, the sepals and petals spotted, and the lip heavily blotched with deep crimson. Native of New Grenada. Flowered by Mr. Bull.

DELPHINIUM TRIOMPHE DE PONTOISE.—*Floral Mag.*, t. 314. Ranunculaceæ. A fine hardy perennial, with palmatifid leaves, and double flowers, remarkable for their great regularity and button-like appearance, and of a pale azure blue with a good deal of white. Raised in the south of France. Flowered by Mr. Fraser.

HELICONIA HUMILIS.—*Bot. Mag.*, t. 5613. Musaceæ. A beautiful stove herb with oblong lanceolate leaves on slender petioles, 2 to 3 feet long, and a shorter scape, bearing pale green flowers supported by large distichous scarlet spathes. Native of Guiana. Flowered at Kew.

HELIOTROPIUM CONVULVULACEUM.—*Bot. Mag.*, t. 5615. Boraginaceæ. A free-blooming much branched annual, 1 to 2 feet high, with linear oblong leaves, and axillary flowers having a salver-shaped white corolla, an inch across, and nearly flat. Native of New Mexico, Arkansas, &c. The flowers are sweet-scented, and open towards the evening. Flowered by Mr. Thompson.

LOBELIA PROGRESS.—*Floral Mag.*, t. 316. Lobeliaceæ. A remarkably fine variety of the fulgens section, producing very large flowers of a rosy purple colour. Flowered by Mr. Bull.

LYCASTE GIGANTEA.—*Bot. Mag.*, t. 5616. Orchidaceæ. A stately sub-terrestrial Orchid, with very large pseudobulbs, plicated oblong-lanceolate leaves, and large solitary flowers terminating the radical scapes; the sepals and petals are long, warm yellowish-olive, the lip serrated, velvety maroon, bordered with orange. Native of Central America. "With the exception of *L. Skinneri*, *L. gigantea* is perhaps the best of its race," though the colours are not very brilliant. Flowered by Messrs. Veitch & Sons.

PASSIFLORA FULGENS.—*La Belg. Hort.* xvi., 193, t. 13. Passifloraceæ. A very handsome stove shrubby climber, with terete stems, oblong ovate lobato-dentate leaves, somewhat like those of an Oak, and axillary peduncles, bearing three ovate-lanceolate entire bracts, and supporting each a solitary flower of a rich scarlet, the linear oblong segments of which are at length reflexed; the filaments of the coronet are white, barred transversely with orange red; the fruit is large, egg-shaped. Native of Brazil, in the region of the Amazon. Flowered by M. Linden.

PELARGONIUM (NOSEGAY) DUCHESS OF SUTHERLAND.—*Floral Mag.*, t. 315. Geraniaceæ. A fine variety of bedding Pelargonium, belonging to the Nosegay section. The leaves are plain green, without zone, while the flowers are well formed, of a bright cerise rose, and grow in large showy trusses. Raised at Cliveden. Flowered by Mr. Turner.

SAPRANTHUS NICARAGUENSIS.—*Seem. Journ. Bot.* iv. 369, t. 54. Anonaceæ. A middle-sized tree, with oval acuminate leaves, and large bell-shaped green flowers, 4 or 5 inches long; these gradually change to a dark bluish black, and then emit a powerful carrion-like odour. Native of Nicaragua. "It is strange that

the carrion-like smell peculiar to *Sapranthus*, should always accompany a dark brown or dark blue colour, and it would be worth while to ascertain the chemical principle here at work." Not yet introduced, but worthy of being so.

SIPHOCAMPYLUS FULGENS.—*Floral Mag.* t. 313. Lobeliaceæ. A free-flowering and handsome stove herb, with branching stems, ovate acuminate leaves, and axillary long-stalked tubular flowers of a rich orange scarlet with a yellow throat. Native of South America. Flowered by Mr. Bull.

CHERRY, LUDWIG'S BIGARREAU.—*Florist and Pomol.* v. 257. An Early Bigarreau ripening just after the Early Red Bigarreau at the end of June or the beginning of July. The fruit is long and acutely heart-shaped, deep red, and the flesh is pale yellow, very melting and juicy, and much more tender than Bigarreaus usually are. Fruited by Mr. Rivers.

PEAR, FONDANTE DU COMICE.—*La Belg. Hort.* xvi., 309, t. 17. A handsome-looking variety, said to be of the first quality, ripening in October and November, or in some seasons rather earlier. The fruit is pyramidal ovoid, with a long stalk somewhat laterally inserted, and a small sunk eye. The colour is greenish yellow dotted with brown, and having an orange shade on the sunny side; the flesh is white and firm, but melting and without grittiness, the juice abundant, sugary, and agreeable. Raised at Angers in the Garden of the Horticultural Society of that place. Fruited by M. Galopin.

INSULAR FLORAS.

THE following is the substance of a Lecture delivered before the British Association for the Advancement of Science, at Nottingham, on the 27th of August last. It is a mere fragment of the subject its title indicates, treating, and in outline only, of but a very few of those groups of oceanic islets, the Floras of which have long engaged my attention. The gratification which the favourable reception of this lecture afforded me, has something to do with my wish to extend a knowledge of it; I may, however, further plead other motives, as the wishes of many friends who did or did not hear it; and one unexceptionable one—a desire to see its statements and methods investigated by others, and more facts accumulated, which would much aid me in my project of treating the whole subject of Oceanic Floras comprehensively at a future time. *J. D. Hooker, Royal Gardens, Kew, Dec. 9.*

The subject which I bring before you to-night is that of Insular Floras, in their relations to one another and to the great continents from which they have or appear to have derived their plants. And as my treatment of the subject is partly descriptive and partly theoretical, I have cast it in the form of a written discourse.

I must warn you that the term 'Insular Floras' is a technical one, and, like so many technical terms, is apt to mislead till explained. In a botanical sense I have limited it to the Floras of those islets that rise as mere points of land from out the broad breasts of the great oceans. With few exceptions all are volcanic, all mountainous, and so small that no man has realised their smallness who has not sailed in search of them.

Our largest maps of the world give us no idea of the diminutive size of such islets as Madeira and St. Helena, any more than Bradshaw's map gives any notion of the size of the railway lines as compared with the counties they traverse. The only contrivance I know of that ever did give me an approximate idea, was Wyld's Great Globe in Leicester Square. This was owing partly to the great scale of that admirable contrivance, and partly to the omission of names—names which sprawl over more degrees in our maps, than the islets themselves occupy seconds.

The relationships between these oceanic island Floras are of two kinds, that must not be confounded: one a relationship of analogy between themselves, due to the physical conditions common to them all—to their climate, exposure, limited area, distance from continents, &c. Thus they are rich in Ferns, Mosses, and other flowerless plants; and they possess many evergreen, but comparatively few herbaceous plants, and fewer or no indigenous annuals. Plants which are herbs on continents, often either themselves become shrubby in islets, or are represented by allied species that are shrubby or arboreal. Species are few in proportion to genera, and genera in proportion to orders. The mountains, however lofty, present few alpine or sub-alpine species; and the total number of species is usually small compared with what a continental area of equal size and conditions would contain. The other is a relationship of affinity, a *bonâ fide* kinship, which the Floras of islands display in common with one another or with certain continents: as is shown by Madeira, the Azores, and Canaries containing many plants in common that are not found on any continent; by the Canarian Flora being in the main a Mediterranean one; the St. Helenan being an African, and so forth. It is with the consideration of these affinities that I shall occupy your attention to-night.

But before proceeding to abstract considerations, it may help you to a clearer insight into my subject if you will voyage in imagination with me over some of the great oceans, visit a few groups of their islands, and look with me upon the principal features of their Floras.

It was my good fortune to be attached, early in life, to one of those expeditions of discovery that have added so much to the naval renown of our country. This was the Antarctic Expedition of Sir James C. Ross, which originated with the British Association of 1838, held at Newcastle, and which circumnavigated the globe for the double purpose of making magnetic observations, and prosecuting geographical discovery in high southern latitudes. These objects required our visiting many oceanic islands, including some of the most remote and inac-

cessible, a circumstance which gave me a special interest in these Floras.

And for the purpose of better illustrating the subject, I have here hung before you Sir Henry James' new 10-foot projection of two-thirds of the sphere on a plane, which includes all the islets whose Floras I shall touch on to-night. This map is constructed so as to carry out the idea of looking at a globe from the inside. The eye is supposed to be directed towards central Africa, not from the centre of the sphere, but from a point so far in the opposite direction to central Africa that two-thirds of the sphere is embraced by the vision. By this arrangement you will see that the relative positions of the islands and continents in the Atlantic and Indian Oceans, with whose Floras I shall have to do this evening, are represented more truly in position than in a Mercator's or other projection; but on the other hand, that the bounding countries of the chart are much distorted. These islets are the Madeiran, Canarian, Azorean, and Cape de Verd groups; St. Helena, and Ascension—all in the Atlantic; and Kerguelen's Land in the South Indian Ocean.

Let us commence with the Atlantic Ocean and the Madeiran group, consisting of Madeira, Porto Santo, and the rocks called Dezertas.

On landing we are at once struck with the European character of the vegetation, and though exotic plants abound, as some Palms, the Orange, Banana, Sugar Cane, &c., it is wonderful with what ease we distinguish between the indigenous or naturalised European element, and the cultivated and semi-naturalised exotic.

But though the vegetation is European in the main, it is not so altogether, and even its European features soon arrange themselves in a botanist's eye under different categories, very much as follows:—The majority, including almost if not all the annuals, we find to be identical with European plants, and undistinguishable from them; others differ from European plants by slight but certain characters, as varieties we say; a third class are specifically different from European, and yet seem to hold a place corresponding to what their nearest allies occupy in Europe—these are representative species; and a fourth class comprises plants that are evidently allied to European, but belong to different genera—these constitute representative genera.

Now, it is a curious fact, that when we tabulate these classes, we find that to a great extent they form a graduated series, not only in systematic order and structure, but in point of numbers; in other words, the plants identical with those of Europe are both the most numerous in species, and the species are most numerous in individuals: then come the varieties—some are scarcely perceptibly different from European plants, others constantly, and these are less numerous and less common. Then come the distinct species: of these some would be called varieties by many botanists, and others good species by all; these are still less common. Lastly, of the different genera, some constitute what all botanists call a good genus, others would, with some botanists, take rank as slight modifications of European genera; these are both the fewest in number and most local in distribution, many indeed being confined to single spots, or even represented by single plants.

So much for the European element of the Flora.

Take now the separate islets of the group: Porto Santo is only 30 miles from Madeira itself, and the nearest of the Dezertas 15; yet we find that these islets not only differ materially in their Floras from the main island, but from one another, in species, varieties, and even in genera.

On penetrating to the rocky and precipitous interior, whether of the main island or the smaller, we find many indigenous trees and shrubs, that are not only foreign to Europe, but are allied to American, to African, and to Asiatic plants: thus we have trees of *Clethra* and *Persea*, genera found in no continent but America; of *Apollonias* and others found elsewhere on a continent only in the East Indies; and of *Dracaena* and *Myrsine*, that betray an African affinity. As these non-European plants inhabit the Canaries and Azores also, they have been called *Atlantic types*, under which name I shall speak of them.

Lastly, when we ascend the mountains of Madeira above 4000 feet and up to their summits (6000), we find little or none of that replacement of the species of a lower level by those of a higher northern latitude, with which we are so familiar in ascending any continental mountains of equal or less height. Plants become fewer and fewer as we ascend, and their places are not taken by boreal ones, or by but very few.

Here then are various botanical features, in respect of which Madeira and its satellite islands, Porto Santo and the Dezertas, differ very much from continental areas of equal extent and elevation, or from islands lying near the coasts of a continent, the Floras of which are therefore continental.

Let us take Great Britain as a standard of comparison. Great Britain contains twice as many flowering plants as the Madeiran group; but these are, with scarcely an exception, identical with continental European; it contains but few varieties differing from those of the neighbouring continent, and only one indigenous non-European genus, which is an American water plant. Moreover, on ascending above 2000 feet, a rapid replacement of species succeeds.

And so it is with any other corresponding area in Europe: none present a similar assemblage of Asiatic and American plants, nor an equal number of peculiar varieties, species, and genera, as the Madeiran group does, nor so many peculiar plants represented by so very few specimens; and nowhere do we find the rocky islets on the coast of a continent to be tenanted by numerous singular genera, species, and varieties, which are to be found nowhere else on the surface of the globe. What should we say, for instance, if a plant so totally unlike

anything British as the *Monizia edulis* (an Umbelliferous plant, with a stem like an inverted elephant's trunk, crowned with a huge tuft of Parsley-like foliage), were found on one rocky islet of the Scillys, or another Umbelliferous plant (*Melanoselinum*) with a slender trunk like a Palm, on one mountain of Wales; or if the Isle of Wight and Scilly Islands had varieties, species, and genera too, differing from anything in Britain, and found nowhere else in the world!

Of all the above peculiarities, it is those very rare and local plants that are isolated as genera, and in geographic distribution, that arrest the inquirer's attention and force him to speculate. We must ask ourselves, were these almost unique isolated individuals created as complete highly specialised organisms, or are they modifications of allied plants, owing their strange forms and special attributes to centrifugal variation operating through countless ages? and however they have originated, are we to regard these solitary representatives of such strange forms of vegetation as the first of their several races, destined, mayhap, to increase, and become in future as common as they are now rare; or the last of their races, which, but for the rapid advance of modern science, would have passed away, along with those countless forms of animal and vegetable life that once peopled the globe, but whose forms and structures will never be revealed to us?

Considerations which I cannot here enter into warrant our belief that such plants on oceanic islands are, like the savages which in many cases have been so long the sole witnesses of their existence, the last representatives of their several races; and the question involuntarily arises—How did this come about?

Excluding the direct agency of man, and of animals introduced by man, I believe that a principal cause of the rarity or extinction of old species on oceanic islands is the subsidences they have all experienced. This sinking of the island operates in various ways. 1. It reduces the number of spots suitable to the habits of the plant. 2. It accelerates that struggle for existence which must terminate in the more hardy or more prolific displacing the less hardy or less prolific. 3. It reduces both the numbers and kinds of insects to whose activity the fertilising process in plants, and hence their propagation, is so largely due; and not only does it reduce the numbers and kinds of insects, but the destruction falls heaviest on the winged kinds, which, as has lately been shown, are almost exclusively the agents in this process; for these, as the area becomes contracted, are blown out to sea and lost in greater proportion than the wingless. Nor is this mere conjecture. Mr. Wollaston's careful entomological researches in Madeira and the Canaries prove that winged insects exist in wonderfully smaller proportions to wingless, in these islands, than on the continents, and I can extend this observation to all the oceanic islands that I have visited.

But in Madeira the agency of man must not be overlooked. The natural history of that lovely island has undergone such a revolution within the last 400 years, as under the ordinary operations of Nature can only be measured by the geological chronometer. In the romantic story of its first discovery, it is stated to have been covered with wood, whence its Portuguese name of Madeira, and this is confirmed by the first settlers, who found the forests to be impenetrable, so that they set fire to them, and a conflagration ensued which lasted seven years. Cultivation and the introduction of European trees followed; and who now can form a conception of the number of peculiar plants that utterly perished in the flames, or that have since been elbowed out by the more vigorous introduced European vegetation? And with regard to Porto Santo, in about the year 1418 a mother rabbit and her brood were landed, and increased so rapidly, that they not only consumed the native vegetation, but the cultivated, and actually drove the settlers from the island.

Such catastrophes help us to account for the rarity of many of the species, but not of those that inhabit the tremendous scarped precipices of the coast and interior, which are equally inaccessible to man and fire; nor of those of the outlying islets. For such, and for the presence of the Laurels and other plants of the Atlantic island type, as contradistinguished from European, we must seek other and far different explanations, which we shall best understand after visiting other oceanic islands.

(To be Continued.)

Home Correspondence.

Oncidium macranthum.—The various articles which have appeared in the *Gardeners' Chronicle* under this heading seem to render confusion worse confounded, and *Oncidium macranthum* runs a risk of being considered a myth. With all due deference to Mr. Skinner, whose services to horticulture no one more fully appreciates than I do, the *Oncidium macranthum* has conical pseudobulbs 3 to 4 inches in length, sometimes separated one from the other it is true, but generally grouped together, and as these latter are more easily preserved, they are selected in preference by my collector. On the other hand, *Odontoglossum coronarium* has flat rounded bulbs of a brownish colour, separated often one from the other by rhizomes a foot in length, and of the thickness of a quill. As to the "noticeable fact" mentioned by the writer of the article at p. 1245, 1866, he might have seen, by consulting the two last catalogues of my sales, that Mr. Stevens copied in the second that which had been said in the first with reference to this *Oncidium macranthum*. Now it happened by chance that between the two sales a new consignment of the same Orchid arrived, and in better condition than the preceding one, and this explains how it was that the last sale was enriched by some ten lots (*une dizaine*),

which were sold for a mere song in consequence of the doubts that arose among the amateurs present. In order to reassure purchasers, I consider it my duty to declare that the *Oncidium macranthum* sent by me to Stevens' are not only true, but that they belong to the most brilliant variety of that most noble species, a variety which I have called var. *hastiferum*. I declare moreover that I guarantee all the plants sold under that name, as also those under that of *Odontoglossum coronarium*, and that I am ready to indemnify liberally those who may have reason to complain. I cannot, any more than Mr. Skinner, prevent the errors that occasionally occur in the case of imported Orchids, but these errors can only occur in species having a great resemblance in their pseudobulbs, and which, collected in the same locality by the collector, and sent in good faith under the same name, turn out to belong to different species, and sometimes even to different genera. Between such an accident and wilful fraud there is a vast difference, and an imputation of the latter would be very culpable. It is, to say the least, strange that the writer of the article quoted upholds the authority of Mr. Skinner, while the sales took place under the responsibility of a name identified for the last thirty years with the Orchids of the Cordilleras and Andes, and who had discovered and published in the "*Pescatorea*," the *Odontoglossum coronarium* above referred to. This should not have been forgotten before entering upon a discussion so disagreeable for him on account of whom the plants were sold. I will add that a specimen of *Oncidium macranthum* is now in bud with me, and that those who are incredulous may soon be convinced *de visu*. *Oncidium diadema* and *Phalaenopsis*, as well as *Odontoglossum cristatum* and *cirrhosum*, are flowering with me at this time, and they prove the accuracy of the drawings sent by my collector Wallis. *J. Linden, Brussels, December 30.*—There is an old saying that "the proof of a pudding is in the eating;" and on this authority we are justified in stating that, whatever some of the plants sold by Linden at Stevens' Rooms for *Oncidium macranthum* may be, all are not true. We bought one as *O. macranthum*, with a smooth conical bulb; it is now in bloom, and is not *O. macranthum*, but (apparently) *O. serratum*, a species nearly allied in habit, but with totally different flowers. Another plant sold as *Odontoglossum cirrhosum*, for which we paid 5*l.*, proves only a poor variety of *Oncidium cucullatum*. We do not infer that others, sold under these names, were also necessarily wrong, but we wish to show that names are not always to be trusted. We may add that none of the plants sent home to us by our collector from Ecuador, have the long rhizome (causing a space of many inches between the bulbs) which "J. H." regards as a character of the true *O. macranthum*, if we understand him correctly. On the contrary, they have compressed semi-pellucid bulbs, in one row certainly, but contiguous if not actually in contact. Along with these plants an excellent coloured drawing from Nature was sent, which was at once identified by Professor Reichenbach as *O. macranthum*. It is only fair to M. Linden to say that some of the plants sold by him as this species, appear exactly to resemble those sent by our own collector, so far as we are able to judge. As to *Odontoglossum coronarium*, we feel little fear in expressing a conviction that not one of the plants sold for that species is really so! We believe that they will all prove to be *O. brevifolium*, which we have also received from our collector, along with dried specimens and coloured drawings, accepted by Professor Reichenbach as being that species. These have a long space between the bulbs (4 to 6 inches). We have several other plants evidently belonging to the same group, but differing specifically one from another, which have the same kind of elongated rhizomes. It is, we think, unwise to speculate on these till they actually bloom and declare themselves; but we have seen enough to satisfy us that we are as yet only as it were on the threshold of knowledge, both with regard to the distinguishing characters of the species comprising the *Cyrtocilian Oncids* (in which group *O. macranthum* stands) and of the section of the genus *Odontoglossum*, which is so near akin to it in style of growth. Patience will reveal much, and we may briefly state that it will not (apparently) have to be severely strained in regard to the plant we have imported as *Oncidium macranthum*, as one of these already shows a flower stem. *Jas. Backhouse & Son, York.*

Downton Castle Early Dwarf Cabbage.—Knowing something of this Cabbage for some years back, I felt interested in the question put by "E. W." (see p. 1194, 1866), and was pleased to notice a reply at p. 1249 of the same volume. It is obvious that the gist of your correspondent "H. D. M.'s" remarks is to give the Cabbage a good character. I am glad of this, for it deserves it; though I believe in the case in question its earliness is a good deal over-rated. I confess to being puzzled at the description given of its comparative merits, and I must say even startled at the solution given of the vexed question—occasional rogues among Cabbage and Broccoli. I presume when "H. D. M." describes his Cabbage as having "pure white heads," he means hearts, else either he or others must have the wrong variety. Further, if it came in with "H. D. M." three weeks before Cattell's Dwarf Barnes' and Improved Nonpareil, I would expect it to be ready at least four weeks before the Enfield Market. I have not before heard of these three excellent varieties coming in together under the same treatment, but am I to understand that the existence of rogues—I hope not Kale and Late Broccoli such as "E. W." complains of—in our finest and most carefully selected varieties of Broccoli and Cabbage is attributable to "the high state of hybridisation and delicate constitution of many of our new varieties of vegetables?" A comfortable line of argument this for our seedsmen, who need not therefore in future be particular about the purity of their stocks. For my own part I would

violaceum (Rchb. f.), even as to most minute details, as the hairy lines at the base of the lip, descending in the spur so as to produce a sort of sphincter, for the pedicellate pollinia. The chief difference is to be found in the shape, and, in consequence, in the nervation of the lip. The lip of *Saccolabium violaceum* is panduriform, retuse at the apex, with a tooth in the end. All the nerves run nearly parallel. Here the lip is tapering to the base, much dilated at the apex, where it is trifid, but not truncate, with a projecting tooth. Both species have a projecting callosity beneath the lip. Let us add, that the colours of *Saccolabium violaceum* have a more bluish hue, and that that species, bearing more blotches both on the sepals and petals, has a totally different appearance. *S. Harrisonianum* we regard as a splendid white variety of the last. *Rchb. fil.*

INSULAR FLORAS.

(Continued from p. 7.)

THE CANARY ISLANDS form a much larger and more important Archipelago than those of Madeira, are situated 300 miles further south, and are much nearer the African coast, and yet their Flora is not that of Africa, and indeed contains comparatively very few of the plants of that continent.

The Canary Islands contain upwards of 1000 native species, of which fully one-third are absolutely peculiar to the group, and these admit of almost precisely the same classification as the Madeiran plants. Thus, the mass of the plants are identical with Mediterranean species; then follow, in numerical importance, those that are representative, as slight or well marked varieties, or congeners or co-ordinates of the Mediterranean genera and species. After these come, and in great force, the Atlantic plants, including no less than 40 of the Madeiran shrubs and trees that are not found in Europe or Africa, and as many representatives of Madeiran genera, species, and varieties, together with a number of allied ones more nearly related to African, Indian, and American plants than to European. Lastly we have, as was to be expected, a sprinkling of African plants, belonging to that division of the African Flora, which, being different from the Mediterranean on the one hand and from the Equatorial African on the other, extends from Western Asia through Arabia and across the Sahara to Cape Blanco:—a Flora conterminous in longitude with the distribution of the domesticated camel, which is used as a beast of burthen even in the Canary Islands. This Flora I would call the Arabo-Saharan.

The lofty mountains of the Canaries, though upwards of 11,000 feet high, contain no alpine plants, and as in the case of the Madeiran group, many of the most peculiar forms are extremely rare and local. Lastly, the Floras of the several islets of the group differ much from one another. The two easternmost, Lancerote and Forteventura, especially, thus standing in the same relation to the others, that Porto Santo and the Dezertas do to the main island of Madeira.

It is not necessary to do more than thus broadly sketch the general features of the Flora of this group, to show you what a parallel it exhibits to the Madeiran, and how intimate their original botanical connection must have been.

And that this connection was something more than a botanical one is proved by the examination of some rocky islets that scarcely emerge 100 feet above the surface of the Atlantic, almost midway between Madeira and the Canaries; these are the rocks called SALVAGES, of which one, that is I believe scarcely a mile long, is covered with a scanty vegetation. It was natural to suppose that this isolated rock at least would have been peopled by migration from the African coast, but it is not so. My friend the Rev. Mr. Lowe, who has spent many years in botanising in the Madeiran and Canary Islands, is the only naturalist who has ever visited these storm-beaten rocks. This he did last year, and he informs me that they contain an Atlantic Flora, and one intermediate in character between that of Madeira and the Canaries, but most closely related to the latter. The Salvages hence appear to be the peaks of a submerged island that once occupied an important botanical as well as geographical position in the Atlantic Ocean, more or less closely linking the Canaries with Madeira. It is impossible otherwise to explain its colonisation by these insular oceanic types that are equally foreign to Europe and Africa.

THE AZORES ISLANDS are the third great North Atlantic group, and demand more special notice, because of their remoteness from any continent. This archipelago is 740 miles distant from Portugal, 1035 from the nearest American land (Newfoundland), and almost double that distance from the American States in the same latitude as itself. They are 500 miles from Madeira.

Of flowering plants 350 species have been collected from the principal islands, a very small number considering their extent, but enough to give us a clear insight into the nature of the Azorean Flora. Of these some 30 are peculiar species or well-marked varieties, representatives for the most part of Madeiran or European plants. About 30 are Atlantic types, common to the Azores and Madeira, or to the Azores and the Canaries, or to all; the rest are Portuguese and Spanish plants. Thus, though the absolute number of plants foreign to Europe is even less than in the Canaries and Madeira, these hold a far more important position in the whole Flora, from including so many of those peculiar Atlantic trees and shrubs that link all these three groups into one well-marked though fragmentary Flora.

Though so much further north than Madeira, the Azores contain scarcely any more boreal plants than Madeira, or even than the Canaries; and such as it does possess are likewise found in the mountains of the Spanish Peninsula. The most notable are the common Ling or Heather (*Calluna vulgaris*), and the beautiful St. Dabeoc's Heath, which is elsewhere found

only in the extreme west of Ireland, and in the Pyrenean region. A third is *Littorella lacustris*, a little water plant that inhabits a mountain lake, probably the crater of an extinct volcano, much frequented by migratory water-fowl.

As in the other groups, there is here a considerable difference between the Floras of the separate islets; and one of the most conspicuous and beautiful plants in the Azores, the *Campanula Vidalii*, is absolutely confined to a single sea-girt rock off the east coast of Flores. This plant was never gathered but once, by Captain Vidal, whose name it bears, during his survey of the island some 20 years ago. Captain Vidal's survey was most fortunately accompanied by a scientific botanist, Mr. H. C. Watson, who both named this remarkable plant, and sent seeds of it to Kew. From these seeds the plant has been propagated, and there are now probably a thousand-fold more plants of it in the greenhouses of England than exist in its native locality!

Considering how far removed the Azores are from Europe, and how much nearer they are to America than Madeira and the Canaries are to that continent, it might appear strange that the group contains scarcely any American plants not found in the other groups. But such is the case, and more than this; for even the *Clethra* of the Canaries and Madeira, a genus found nowhere else out of America, does not inhabit the Azores.

The only trace of American influence on the Azorean Flora that I can substantiate, is in a species of the Umbelliferous genus *Sanicula*. Of this genus a common European species is spread almost all over the globe, inclusive of Madeira and the Canaries, but exclusive of the Azores; whereas another species of this same genus takes its place in the Azores, and this species is most closely allied to an American one.

It is a significant fact, that the minute seed-vessels of *Sanicula* are provided with hooked bristles, suggesting the probability that these were originally transported by birds across the Atlantic.

I may add that the large Bean-like seeds of *Entada*, a West Indian plant, are thrown up abundantly on the islands by the Gulf Stream, but never grow into plants, if indeed they ever germinate on their shores. Some years ago a box of these seeds from the Azores was sent to Kew, where many germinated and grew to be fine plants, showing that their immersion during a voyage of nearly 3000 miles had not affected their vitality.

Another group of islands, far distant from the above, demand a passing notice, as they have been regarded by some botanists as members of this Atlantic Flora. These are the CAPE DE VERDES, situated far within the tropics, 800 miles south of the Canaries, and 300 distant from the African coast.

I visited this group in 1839, and found the Flora of the lowlands to be purely African and Arabo-Saharan in character, but on ascending the mountains, I met with a few plants very characteristic of the Canaries and Madeira. The Rev. Mr. Lowe has during the last two winters diligently botanised this group, with most interesting results. He finds, as I did, that the mass of the Flora is African, and that the mountains contain many Canarian types; but that all these are the types that have representatives in the Mediterranean region, whilst of those peculiar Canarian, Madeiran, and Azorean plants that have no near allies or representatives in Europe, not one is found in the Cape de Verdes, with the single exception of the Dragon's-blood tree.

Also, ascending above this zone to 5000 feet and upwards, many of the same middle-European plants are found that appear at correspondingly lower elevations in Madeira, the Canaries, and Azores, and I may add that these are also found on the lofty mountains of Equatorial Africa and Abyssinia.

We have thus in the Cape de Verd Islands a certain relationship with the Canaries and Madeira almost to the exclusion of the Azores; but it is a feeble one, and so blended with that of the African continent, and especially of the Mediterranean region, as to suggest other considerations than what concern us here.

ST. HELENA.—The botanical history of this speck in the vast Atlantic Ocean is a most curious and instructive one. It lies in lat. 16° S., is 1200 miles from Africa, 1800 from America, and 600 from Ascension, its nearest land; it is only about 10 miles long, by seven broad, and rears itself out of the ocean, a black pyramidal volcanic mass, girdled with beetling sea-cliffs, that are cleft by narrow ravines. When discovered, about 360 years ago, it was entirely covered with forests, the trees drooping over the tremendous precipices that overhang the sea. Now all is changed, fully 5-6ths of the island are utterly barren, and by far the greater part of the vegetation that exists, whether herbs, shrubs, or trees, consists of introduced European, American, African, and Australian plants. The indigenous Flora is almost confined to a few patches towards the summit of Diana's Peak, the central ridge, 2700 feet above the sea.

The destruction of the Madeira forests you will remember was by fire. A much more insidious agency has operated with tenfold greater effect in St. Helena, viz., goats. These were introduced in 1513, and multiplied so rapidly, that in 1588, Captain Cavendish states that they existed in thousands; single flocks being almost a mile long.

In 1709, trees still abounded, and one, the native Ebony, in such quantities, that it was used to burn lime with. At this time, however, the Governor of the island reported to the Court of Directors of the East India Company, that the timber was rapidly disappearing, and that the goats should be destroyed for the preservation of the Ebony wood, and because the island was suffering from droughts. He received the laconic reply, "The goats are not to be destroyed, being more valuable than Ebony."

Another century elapsed, and in 1810 another

Governor reports the total destruction of the great forests by the goats, which greedily devour the young plants, and kill the old by browsing on their leaves and bark, and that fuel was so scarce that the Government paid for coal (and this in a tropical islet), 2729*l.* 7*s.* 8*d.* annually. Still, even then, so great was the amount of seed annually shed, so rich the soil, and so rapid the growth of the native plants, that the Governor goes on to say, that if the goats were killed, and the island left to itself, it would in 20 years be again covered with indigenous vegetation.

About this time the goats were killed, but another enemy to the indigenous vegetation was at the same time introduced, and which has now rendered it in all probability impossible that the native plants will ever again resume their sway. Major-General Beatson, then Governor, an active and sagacious officer, proposed and carried out the introduction of exotic plants on a large scale, and from all parts of the world; these have propagated themselves with such rapidity, and grown with such vigour, that the native plants cannot compete with them. The struggle for existence had no sooner begun, than the issue was pronounced; English Broom, Brambles, Willows and Poplars, Scotch Pines and Gorse bushes, Cape of Good Hope bushes, Australian trees and American weeds, speedily overran the place; and wherever established, they have actually extinguished the indigenous Flora, which, as I said before, is now almost confined to the crest of the central ridge.

It is therefore now impossible to distinguish the introduced from the native plants of St. Helena; but most fortunately Herbaria exist, made at the beginning of this century, that to a great extent supply the deficiency. Of these, the most complete was formed by the late Dr. Burchell, the eminent South African and Brazilian traveller, who spent five years on St. Helena, from 1805 to 1810. Unfortunately for science, Dr. Burchell never published, and scarcely allowed any naturalist access to his Herbarium. On his death, last year, his magnificent botanical collections were presented to Kew by his sister, and amongst them I found his invaluable St. Helena Herbarium in a capital state of preservation.

It includes 169 flowering plants, but most unhappily Dr. Burchell has not indicated which are *bona fide* natives, and which have followed the track of men and animals introduced by him, and which have become quasi-indigenous or naturalised. Some years after Dr. Burchell's visit, however, an eminent Indian botanist, Dr. Roxburgh, visited St. Helena, and drew up a catalogue of the indigenous, naturalised and cultivated plants, then existing, carefully indicating the truly indigenous ones that were then surviving. Dr. Roxburgh's collection was much less complete than Burchell's, but by collating the two, and with my own observations made during two visits to the island, I have arrived at a fairly accurate estimate of the number and affinities of the native vegetation remaining.

According to these data, about 44 indigenous species then inhabited the island before Major-General Beatson destroyed the goats, and introduced the European, &c., plants, to which five dubious natives may possibly be added. All are shrubs, trees, or perennial plants, not one is an annual (though introduced annual plants abound, both tropical and temperate). Forty of them are absolutely peculiar, and five are tropical weeds or seaside plants of very wide distribution.

These forty are absolutely peculiar to St. Helena, and with scarcely an exception, cannot be regarded as close allies of any other plants at all. No less than 17 of them have been referred to peculiar genera, and of the others, all differ so markedly as species from their congeners, that not one comes under the category of being an insular form of a continental species. Many of them are excessively scarce, being now found in very small numbers, and on single rocks; not a few have never been gathered since Dr. Burchell's visit, some are certainly now extinct, as the beautiful Ebony tree, and probably nearly one-fifth have totally disappeared during the last half-century, or are now all but extinct.

From such fragmentary data it is difficult to form any exact conclusions as to the affinities of this Flora, but I think it may be safely regarded as an African one, and characteristic of Southern extra-tropical Africa. The genera *Phyllica*, *Pelargonium*, *Mesembryanthemum*, *Osteospermum*, and *Wahlenbergia* are eminently characteristic of Southern extra-tropical Africa, and I find amongst the others scarce any indication of an American parentage, except a plant referred to *Physalis*. The Ferns tell the same tale; of 26 species, 10 are absolutely peculiar, all the rest are African, though some are also Indian and American.

The botany of St. Helena is thus most interesting; it resembles none other in the peculiarity of its indigenous vegetation, in the great variety of the plants of other countries, or in the number of species that have actually disappeared within the memory of living men. In 1839 and 1843 I in vain searched for forest trees and shrubs that flourished in tens of thousands not a century before my visit, and still existed as individuals 20 years before that date. Of these I saw in some cases no vestige, in others only blasted and lifeless trunks cresting the cliffs in inaccessible places. Probably 100 St. Helena plants have thus disappeared from the *Systema Naturæ* since the first introduction of goats on the island. Every one of these was a link in the chain of created beings, which contained within itself evidence of the affinities of other species, both living and extinct, but which evidence is now irretrievably lost. If such be the fate of organisms that lived in our day, what folly it must be to found theories on the assumed perfection of a geological record which has witnessed revolutions in the vegetation of the globe, to which that of the Flora of St. Helena is as nothing.

(To be Continued.)

rosy crimson, each petal with a bold central stripe of rosy white, equal in width throughout, thus forming, as it were, a star with many rays. Raised in Florence. Flowered by M. A. Verschaffelt.

CATTLEYA DOWIANA.—*Bot. Mag.*, t. 5618. Orchidaceæ. This magnificent plant, described at p. 922 of our volume for 1866, is perfectly distinct from all others, and at least equal in beauty to the most beautiful of its race hitherto known. It has the habit of *C. labiata*, and bears very large flowers, the plane lanceolate sepals and broader wavy petals being of a deep nankin-yellow, and the frilled lip wholly of a rich dark puce purple, traversed throughout by golden veins. Native of Costa Rica. Flowered by Messrs. Veitch & Sons, and Mr. Bateman.

CIRRHOPETALUM PAHUII.—*Neerl. Plant.*, 1866, t. 4-5. Orchidaceæ. An odd-looking stove epiphyte, with a creeping rhizome, compressed cylindrical pseudobulbs, solitary, elliptic-oblong leaves, and radical flower scapes supporting an umbel of from 8 to 12 large flowers, which are brownish-red, minutely dotted with red, and having an ovate-lanceolate purple lip; the dorsal sepal is 4 inches long, and the two petals, about half its length, are directed backwards parallel with it, all being prolonged into a filiform tail, while the two lateral sepals are directed forwards parallel with the lip, and are about as long as the petals. It is the *Bolbophyllum Pahuii*, *Reich. f.*, and *Cirrhopetalum flagelliforme*, *Teysmann & Binnendijk*. Native of Java. Flowered in the Leyden Garden.

GRIS CAULIFLORA.—*Bot. Mag.*, t. 5622. Myrtaceæ. A stately Palm-like tropical tree, forming a head of large lanceolate-acuminate leaves, 3 to 4 feet long, and producing pale yellow fragrant flowers 2 inches broad from the trunk, far below the leaves. Native of the Spanish Main. Flowered at Kew. It is the Anchovy Pear of the West Indies.

HIPPEASTRUM ALBERTI.—*L'Illustration Hort.*, t. 498. Amaryllidaceæ. This beautiful hothouse bulb has precisely the habit of *H. equestre*, but its orange-red flowers, yellowish towards the base of each petal, measure as much as 6 inches across, and are full double, the organs of fructification being replaced by from 30 to 40 petals, so that it altogether eclipses the double *H. fulgidum*, which has only two rows of petals. Found cultivated in Cuba by M. Albert Wagner, and sent by him to M. Wagner, of Leipsic, from whom the stock has been acquired by M. Laurentius.

HYDRANGÆA JAPONICA MACROSEPALA.—*Gartenflora*, t. 520. Hydrangeaceæ. A variety somewhat resembling the var. *rosalba* of M. Van Houtte, but described as having the segments of the sterile flowers $1\frac{1}{2}$ inch broad. They are white, becoming tinted with rose as they acquire age. Native of Japan, introduced by M. Maximowicz. Flowered in the St. Petersburg Botanic Garden.

HYDRANGÆA STELLATA PROLIFERA.—*Gartenflora*, t. 521. We have here, observes M. Regel, a rival for the well-known *H. Hortensia*, namely a new *Hydrangea* with a full head of flowers. In habit and foliage it resembles the species we already possess, but the large terminal cyme is densely packed with sterile flowers, of which the sepals, from 10 to 15 in each flower, are elliptic in form, while from one to five similar but smaller flowers are developed in the centre of most of the primary ones; they open of a yellowish-green, and change to rose colour. Native of Japan, introduced by M. Maximowicz. Flowered in the St. Petersburg Botanic Garden.

IRIS KEMPFERI VARS.—*Neerl. Plant.*, t. 33-34. Iridaceæ. Of this beautiful hardy Japanese perennial two fine varieties are figured in the plates before us. They are named *PHILIP VON SIEBOLD*, a very large deep purple with golden blotch near the base; and *ALEXANDER VON HUMBOLDT*, an immense flower, pure white with a golden feather at the base. According to the figure the flowers of the latter variety are more than 6 inches across. Flowered by M. Krelage.

MYOSOTIS IMPÉRATRICE ELISABETH.—*L'Illustration Hort.*, t. 500. Boraginaceæ. This is a hybrid, stated to have been raised between *M. azorica* and a variety of *M. sylvatica*, and, according to the figure, is one of great beauty, remarkable chiefly for the immense profusion of its small bright blue flowers, which have a yellow eye. It is, moreover, said to be almost a continual bloomer, to flower freely in winter, and to force well. It is quite hardy. It was raised by M. Doeller, of the gardens of Schönborn, near Vienna, and is cultivated by MM. Haage & Schmidt of Erfurt.

OPHIPOGON JAPONICUS ARGENTEO-STRIATUS.—*Neerl. Plant.*, t. 31. Liliaceæ. A pretty dwarf hardy herbaceous perennial, having linear-lanceolate leaves striped with green and creamy-white, and bearing racemose spikes of deep blue berries about the size of Currants. The flowers are not described. It appears to be a striped form of the broad-leaved plant known in gardens as *O. Jaburan*. Native of Japan. Flowered by M. Von Siebold.

INSULAR FLORAS.

(Concluded from p. 51.)

THIS is but a brief outline of Mr. Darwin's arguments in favour of trans-oceanic migration; such as it is, it shows a power and skill of bringing facts to bear, and a fertility of invention in devising means of verifying these facts, that almost compel me to agree with him in regarding oceanic transport to be, in the present state of science, the principal and most probable means by which oceanic islands have been stocked with plants; I say most probable, for I should add, that Mr. Darwin does not put this view forward as more than an opinion to which he inclines: with that candour which characterises all his writings, he will not let even the corroborative evidence which his derivative theory affords him, weigh when estimating the value of the two hypotheses.

But though Mr. Darwin's explanations cover many

of the requirements of our problem, and may eventually prove to satisfy all, there are great difficulties in the way of its full acceptance.

First, as regards transport by winds, ocean currents, &c., much that we know of the directions of these agencies in the North Atlantic, is in favour of their bringing American and not European plants to the Azores; and yet we find even fewer American types in this group than in Madeira and the Canaries. This objection is very partially met by the fact that the Azores are nearer Europe than America, and that American plants when brought into competition with European, are beaten in the contest, and that many of the American types were also European during a comparatively recent geological epoch. For the superior American currents of migration should at least keep up some supply.

Nor is it sufficient to quote the fact that the birds of these islands are (as Dr. Sclater assures me is the case), almost identical specifically with European ones, and are thus the living proofs of the migration being from Europe. No doubt they are proofs of bird transport being from Europe, but not necessarily of plant transport; for since the plants are considerably different specifically, and the birds not at all, it may be argued that the birds and plants do not come under the same category. Mr. Darwin answers this objection by the consideration that the migration of birds being continuous and frequent, and these all surviving, they keep up the specific type, and do not give origin to local varieties; whilst the transport of seeds being casual and rare, and very few surviving, these in the process of time give rise to varieties, &c., and do not perpetuate the continental races.

So, too, it is with St. Helena and Ascension—they have no land birds, but an African vegetation; and though nearly midway between Africa and America, they have scarcely a single American type of flowering plants: and Kerguelen's Land has a Flora of whose elements most have emigrated not from the nearest land but from the most distant.

Another difficulty is presented by the extreme rarity of some of the plants common to the North Atlantic Islands; take, for example, that remarkable Canarian tree, *Bencomia caudata*, of which only two individuals have been found in the mountains of Madeira, and these a male and a female. It is almost inconceivable that individuals of both sexes should have been transported within the same lifetime from the Canaries to so great a distance; and so with the other peculiar and rare plants common to these groups; intermediate masses of land, as the Salvages, on which such plants abounded, afford the only conceivable means of inter-insular transport; and if intermediate islands are granted (and Mr. Darwin freely grants these), why not continents?

It is admitted that certain large islands, which lie too near the continents to come under the technical definition of oceanic, and which do contain terrestrial Mammals, as Great Britain, Ceylon, Madagascar, Japan, the Falkland Islands, &c., were once united to the continents to which they are adjacent, and thus received their immigrants; and an examination of the Floras of most of these exceedingly complicates the question, for unlike oceanic islands, many of these do contain, besides the plants of the adjacent continents, many types of those peculiar to the opposite continent—Ceylon containing Malayan plants not found in the Indian Peninsula, Japan possessing N. American plants; and Madagascar, Borneo, and Javan. We should thus be forced to admit that whereas the great islands which are peopled by plants through direct communication with the adjacent continents, do receive immigrants from other most distant continents, the little islets that are much nearer the continent, and over whose course the currents of migration must have swept, have been exempted from its effects. Here, again, as it appears to me, the only answer is by an appeal to the very different rates in which the vegetation has changed in the islands and the continents during comparatively recent geological periods.

Then, too, we have conspicuous examples of islands not having profited by migration from the nearest continent, where it would be most expected they should. Take New Zealand: it does contain certain Australian species and types, but these are not the most common, or most likely to have arrived by trans-oceanic migration. The arboreal vegetation of Australia mainly consists of Gum trees and leguminous plants, which cover three-fourths of the wooded parts of that continent, but not one is found in New Zealand; yet the seeds of the Gum trees are very minute, are shed in inconceivable quantities, retain their vitality long, and both Gum trees and Acacias, when introduced by man into New Zealand, become naturalised at once, and actually displace the indigenous vegetation of the island.

Even if we grant, with Mr. Darwin, that the specific and sub-specific change between the Floras of oceanic islands and continents, is due to the new relations into which the continental plants are brought in the narrow areas that islands present, and the ensuing sharper struggle for existence, how does it come about that the plants of the Azores, which islands are 750 miles from Europe, are less changed than those of Madeira, which is only 300? This objection seems to me to be imperfectly met by the fact that the nearer island, receiving more immigrants, exhibits the sharper struggle; for this same cause should rather replenish the island with identical forms, and by cross-fertilisation tend to keep them more specifically true; as was assumed in the case of the European birds of the Madeiran group being unchanged, whilst the plants of the same group have changed.

With regard to the objection that oceanic islands are volcanic, and hence probably not the mountain-tops of sunk continents, and that they contain no fossil mammals, we have in the Malay Archipelago, vast areas

of land which, if submerged (and they are exposed to constant subsidences and risings) would leave only isolated volcanic peaks, such as oceanic islands present. Were such an area to be submerged, leaving exposed the volcanic peaks of Java and the Moluccas, &c., &c., should we expect to find either recent or fossil terrestrial mammals upon them? Nor should it be overlooked, that as a general rule, islands diminish in size and numbers towards the centres of the great oceans, which, taken with the admission, that the great islands adjacent to the continents were previously united to them, would favour the hypothesis that all may have been so. Then, too, we have instances of continental distribution, presenting facts so analogous to oceanic, and hitherto so utterly inexplicable, on any hypothesis of migration that does not embrace immense geological changes, that we can scarcely avoid coupling the phenomena they present with those of oceanic islands.

On the other hand, to my mind, the great objection to the continental extension hypothesis is, that it may be said to account for everything, but to explain nothing; it proves too much; whilst the hypothesis of trans-oceanic migration, though it leaves a multitude of facts unexplained, offers a rational solution of many of the most puzzling phenomena that oceanic islands present: phenomena which, under the hypothesis of intermediate continents, are barren facts, literally of no scientific interest—are curiosities of science, no doubt, but are not scientific curiosities.

Thus, according to the hypothesis of trans-oceanic migration, and the theory of the derivative origin of species, we can understand why the ancient types, like ancient races of mankind, which have disappeared before the steady forward pressure of superior races on the continents, should have survived on the islands to which but few of the superior race had penetrated; we can understand how it comes about, that so many continental species and genera are represented on the island by similar but not identical species and genera, and also for the representation of genera and species in the separate islets of the group. We can understand why we find in the Atlantic island Floras such a graduated series of forms, ascending from variety to genus, without those sharp lines of specific distinction that continental plants exhibit; why whole tribes are absent in the Islands; why their Floras are limited, and species are few in proportion to genera; why so many of their peculiar genera tend to grotesque or picturesque arborescent forms—and many other minor facts which it would weary you to enumerate.

And if many of the phenomena of oceanic island Floras are thus well explained by the theory of the derivative origin of species, and not at all by any other theory, it surely is a strong corroboration of that theory. Depend upon it, the slow but steady struggle for existence is taking advantage of every change of form and every change of circumstance to which plants no less than animals are exposed; and, that variation and change of form are the rules in organic life, is as certain as that definite combinations and mathematical proportions are the rules in the inorganic.

By a wise ordinance it is ruled, that amongst living beings like shall never produce its exact like; that as no two circumstances in time or place are absolutely synchronous, or equal, or similar, so shall no two beings be born alike; that a variety in the envolving conditions in which the progeny of a living being may be placed shall be met by variety in the progeny itself. A wise ordinance it is, that ensures the succession of beings, not by multiplying absolutely identical forms, but by varying these, so that the right form may fill its right place in Nature's ever varying economy.

The acceptance of general principles, whether in the physical or biological sciences, has always been a slow process, and I look for no exception in the case of this of the derivative origin of species. The physical sciences however, have the start of the biological, scientific progress in them having commenced several centuries ago, whereas it is hardly one century since Botany and Zoology first became the subjects of exact scientific study. Before that period not a system had been invented, and the principles of life, whether in their structural or functional aspects, have for the most part been discovered within the life-time of many of us here, and the knowledge of them is not yet recognised as a branch of a liberal education.

You have all read of uncivilised races of mankind that regard every month's moon as a new creation of their gods, who, they say, eat the old moons, not for their sustenance, but for their glory, and to prove to mortals that they can make new ones; and they regard your denial that their gods do monthly make a new moon as equivalent to denying that they could do so if they would.

It is not so long since it was held by most scientific men (and is so by some still) that species of plants and animals were, like the savages' moons, created in as many spots as we meet them in, and in as great numbers as they were found at the times and places of their discovery. To deny that species were thus created was, in the opinion of many persons, equivalent to denying that they could have been so created.

And I have twice been present at the annual gatherings of tribes, in such a state of advancement as this, but after they had come into contact with the missionaries of the most enlightened nations of mankind. These missionaries attempted to teach them, amongst other matters, the true theory of the moon's motions, and at the first of the gatherings the subject was discussed by them. The presiding Sachem shook his head and his spear. The priests first attacked the new doctrine, and with fury; their temples were ornamented with symbols of the old creed, and their religious chants and rites were worded and arranged in

