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Notes of a BOTANICAL TOUR in the WESTERN AZORES.

*(In a Letter from HEWETT C. WATSON, Esq., to the Editor,
dated, November, 1842.)*

IT was my wish to write to you from the Azores, by way of reporting the progress I was likely to make in investigating the botanical productions of those islands, during the surveying operations of Her Majesty's War Steamer, *Styx*, commanded by Captain Vidal; to whom I had been introduced, through the instrumentality of yourself and Captain Beaufort, as a person, willing to go out at my own cost, for that object, provided an order from the Admiralty was obtained for a passage in the *Styx*. I postponed writing, until I should reach the island of Flores, often stated to have originally derived its name from the beauty or variety of its flowers; and, by this postponement the intention was ultimately defeated. The West India mail-packets touch at Fayal on their homeward passage; but the island of Flores is upwards of a hundred miles from Fayal, with irregular and uncertain opportunities of communication, and before our return to Fayal, I had resolved to take a passage myself in the first mail-steamer to England that should touch thereafter we returned to that island. This resolution I was unfortunate enough to carry into effect, and by so doing, was subjected to the tediousness of a rough passage, protracted to twice its usual length, through sheer mismanagement in taking on board the mail-packet barely

sufficient coals to carry us to Falmouth with a fair wind. The wind proved adverse the whole way, and for a few days blew a hard gale, so that our stock of coal was exhausted before we could make the English Channel; and there was no resource left but that of turning back and running before the wind, under such small sails as could be raised in the steamer, across the Bay of Biscay to Corunna, for a fresh supply of coal. In this dilemma, it was some consolation to anticipate a botanical day or two on Spanish ground; but scarcely was our anchor down before we had notice from the Spanish authorities that none of us could leave the ship, which must be put under quarantine, in consequence of having come from the West Indies. Could this have been foreseen, I should have spent a fortnight on shore in Fayal, and taken my passage in the succeeding mail-steamer; the Styx being about to proceed to the more eastern islands of Terceira and Santo Miguel, to which I would not go, as it appeared very uncertain whether I should be able to land on them for botanizing. By coming home in the mail-packet Dee, I thus lost the opportunity of autumnal botanizing in Fayal, and merely wasted the time in playing at "pitch and toss" in the Bay of Biscay.

My collections were left on board the Styx, to be brought to England in December; and in their absence, at present, I cannot speak with certainty about the specific names of several species that were novelties to me, and therefore not to be determined in the absence of botanical works, which are articles unknown in the Azores. With a few exceptions, all my specimens belong to European genera. Several of the species are identical with those of the South of Europe; others being plants of Madeira or the Canaries; and a few possibly undescribed kinds. Some of these latter species have been distributed in Guthrie's collections under the specific names of "*Azorica*" and "*Calderensis*;" others were probably not gathered by that botanist.

We were rather late in reaching the Azores; that is, late for a botanist to commence collecting in islands whose win-

ter temperature is equal to that of May in England. I had expected to sail in April, but a succession of trifling circumstances (not all of them accidental or unavoidable, I suspect) concurred to detain the *Styx* a month longer in England, and it was not until the 18th of May that we at length steamed out of Plymouth Harbour. The War Steamers are built with a much sharper run from the deck to the keel, than is seen in the ordinary trade and passenger steamers; their form being something like the rapidly sloping roofs of old-fashioned houses turned upside down. In consequence of this build, they roll about most tumultuously on the ocean, and are by far the most uncomfortable ships in regard to their motion, that my slender experience has hitherto made me acquainted with. However, if the *Styx* rolled much from side to side, she rolled onwards also at a brisk rate; and by eight o'clock in the morning of the 25th, I was gratified, on going on deck, by seeing that we were already among the Central Azores, having passed Terceira, and being then on the north side of Santo Jorge; beyond which, in the distance, appeared the lofty Peak of Pico, rising high and sharp into the deep blue sky, with a wreath of white clouds floating like a loose drapery around its dark sides, much below the summit. Before one o'clock of the same day, we dropped our anchor in the Bay of Horta, the principal town of the island of Fayal, right opposite to which, at a distance of five miles, is the northern extremity of Pico island, whose towering Peak thus forms a noble background to the sea-view from the town of Horta. Looking at this great volcanic cone from the deck of the ship, I felt extremely anxious to be upon it, anticipating a rich harvest of Alpine plants, on a mountain whose altitude had been variously estimated from 6700 to 9000 feet. This anticipation was not afterwards realised; the other islands visited yielding me a larger supply of such plants, although their mountains have only half the elevation of the Peak of Pico.

To a lover of plants, who had before never been farther south than Cornwall, the island of Fayal afforded much of interest and attraction. It is of small size, about ten and

twelve miles in cross diameters. Everywhere the coast is formed of precipitous cliffs, with the exception of Praya, the Bay of Horta, and its suburb Port Pym. The Bay is formed by a crescent line of hills varying from three hundred to something near a thousand feet of elevation, by guess. Beyond the middle and highest part of this line of hills, and near to the centre of the island, is an elevated valley, several hundred feet above the sea-level, which is said to have derived its name of *Flamingos*, from having been the spot selected for their home by a body of Flemish settlers. Beyond this valley, again, the ground rises rapidly till we have passed the centre of the island, and approached within three or four miles of the coast, on the contrary side to that on which the Bay of Horta is situated. Here we suddenly come to the edge of the "Caldeira," a deep and nearly circular basin, once no doubt a boiling crater, now, as peaceful and lovely a scene as I ever beheld. It is scooped out, as it were, in the highest part of the island, near the north-west coast, is entirely surrounded by the mountain which constitutes its walls, and is consequently quite without any visible outlet for the streams which pour into it. From the edges of this basin, which I suppose to be between three and four thousand feet above the sea, the land falls in every direction towards the shore, terminating there abruptly in precipitous cliffs, against which the waves are constantly beating. In the Bay of Horta, and in a smaller bay at Port Pym, there are narrow belts of grey sand on the shore; and the same sort of shore is seen at Praya, a couple of miles from Horta, on the other side. My botanizing lay in the neighbourhood of these sandy bays, and in walks from them to the mountains about the Caldeira. Twice I descended into the Caldeira; and once I landed from a boat on the cliffs, several miles north-east of the sands, and strolled about the neighbouring country for a few hours. My rambles thus covered about one third of the island, and were made chiefly in the month of June and beginning of July, with a few short walks about the town of Horta, in the end of May and middle of September.

Of maritime plants, I found only a scanty supply, chiefly on the sands about Port Pym. Here I gathered *Juncus acutus*, *Polygonum maritimum*, *Salsola Kali*, a species of *Cakile*, and a *Convolvulus*, much resembling *C. Soldanella*, but with white and larger flowers. On the other side of Horta, I saw *Euphorbia Peplis*. The rocks of the coast produced another species of *Euphorbia*, an *Arenaria*, and a profusion of *Asplenium marinum*, which indeed grew all over the islands.

In the vicinity of Horta, the land is almost all under cultivation, having been converted into gardens, orange orchards, and cultivated fields, which are fenced by stone walls, with very narrow and rugged roads winding between them, also flanked by the monotonous stone walls. Living reeds are almost the only other material used for fences; and planted in rows, they answer this purpose very well, growing ten feet high and upwards, so as to constitute an excellent protection against the violence of the Atlantic gales, before which their elastic stems bend without breaking. Against the trespasses of man they can be no defence; but by cutting down some of them to be tied as rails across those which are left growing, a sufficient fence against cattle may readily be made. There is a constant renovation of these reed hedges from the succession of suckers thrown out by their roots.

The field crops consist of *maize*, *wheat*, *beans*, *lupines*, *flax*, *potatoes*, and various *gourds*. The gardens produce *lemons*, *oranges*, *grapes*, *figs*, *apricots*, *peaches*, and *bananas*. *Strawberries* do not succeed well, and the fruit which they do bear is with difficulty preserved from the innumerable blackbirds. *Apples* I observed in Pico and Flores, but none in Fayal. *Cherries*, *raspberries*, *gooseberries*, or *currants*, I saw neither in Fayal nor in any of the other islands. As to ornamental shrubs and flowers, anything that grows in our green-houses might or does grow in the open ground in Fayal; but the violent sea-breezes would break and destroy most kinds of trees, as they rose above the shelter of the walls, or of those robust evergreens, which are constantly planted in the gardens and orange orchards to protect the less hardy kinds. The *Pas-*

siflora *caerulea* has become wild, and thrives prodigiously. *Canna Indica* is occasionally found wild, with flower-stalks five or six feet high. The *Amaryllis Belladonna* is abundant in various places about Horta. Yet these three should probably be regarded as introduced plants, which have passed from the gardens to the wilds.

The use of stone walls and reeds for fences is prejudicial to the pursuits of the botanist, who may look in vain for hedges or hedge-banks, meadows or pastures, about the town of Horta or elsewhere in the cultivated regions of Fayal. The pedestrian walks along very narrow paved or rocky roads, hemmed in between two stone walls from six to ten feet high, or along narrow footpaths which cross only cultivated fields. These peculiarities, of course, greatly affect the spontaneous vegetation. What may be considered the characteristic Flora of the Azores, is very sparingly scattered about the town in a few spots, whose steepness or exposure has interfered to discourage the efforts of the cultivator. The wild plants which are met with, are chiefly annual weeds of cultivated grounds, plants which thrive about inhabited places, and such as are adapted to exist on rocks, or in the crevices of stone walls. Some of these are among the commonest weeds of England, as *Sisymbrium officinale* and *Sherardia arvensis*. Others are still English, but among our most local kinds, as *Cynodon Dactylon* and *Polycarpon tetraphyllum*. Others, again, though quite unknown in the English Flora, are still plants of south Europe; as *Phytolacca decandra* and *Portulaca oleracea*. But *Sida Canariensis* (of Guthrie's collection) and *Vicia albicans* are extra-European species, derived from other islands of the Atlantic.

Passing inland from Horta towards Flamingos, we gradually lose many of these ordinary species of cultivated countries, and find the proper vegetation of the Azores, where left more in a state of nature. *Myrica Faya* and *Myrsine retusa* grow on the low hills which encircle the bay, immediately behind the town. *Erica Azorica* (of Guthrie's collection, but in reality *E. scoparia*) and *Thymus caespitosus* are plentiful on these hills, though still more abundant on the wilder moun-

tains above Flamingos. *Spartium junceum* and *Asclepias fruticosa* (growing on the banks of a ravine, where a river crosses the line of hills and forms a waterfall in its approach to the town) may be indigenous, though very local. About Flamingos, the banks of the river are covered with many species of *Ferns*, and a few of the mountain shrubs are seen, the seeds of which probably come down with the streams, as *Menziesia polifolia* and *Calluna vulgaris*; the former of which is extremely abundant on the hill-sides between Flamingos and the Caldeira, and is doubtless the *crimson-flowered heath* mentioned by Messrs. Bullar in their account of the Azores.

Though the orange and lemon ripen their fruit at Flamingos, cultivation ceases altogether within a thousand feet above the village; the highest crops being the *potato* and "yam," as it is called, but it is apparently the *Caladium esculentum*. The proximity of the clouds probably arrests cultivation at this moderate altitude; the "yam" being better adapted to withstand moisture than the other cultivated food-crops of the Azores; indeed, it thrives best in wet or marshy places.

About the upper limits of cultivated ground, where patches of *Myrica Faya* and other indigenous shrubs intermingle with the spaces cleared for the crops, I saw *Rosmarinus officinalis* and *Lavandula Stæchas*, now quite wild, yet possibly originating from the cottage-gardens of Flamingos, in which they are planted; as I did not meet with them in other parts of Fayal, or in other islands. Above the region of cultivation, there is a broad belt of natural wood, which grows up again as it is cut down for fuel. It consists chiefly of *Erica scoparia*, *Myrica Faya*, *Myrsine retusa*, and a species of *Juniperus*, which the natives call "Cedros;" the latter, being very abundant in the Azores, causes several places to be called by its name of *Cedros*. Intermixed with these, but chiefly in the ravines down which the mountain streams rush rapidly, the *Vaccinium Maderense* displays its fine clusters of long drooping blossoms. A large-flowered *Rubus* sends long rambling shoots among the other shrubs, to the great inconvenience of a botanical pedestrian and the barefooted peasants. *Ilex*

Perado, *Viburnum Tinus*, *Laurus Canariensis* (?), and a handsome shrubby *Euphorbia* also occur in the ravines. *Pteris aquilina* and *Blechnum boreale* are very abundant among the shrubs; and many other ferns may be seen growing luxuriantly in the ravines.

As we keep ascending towards the Caldeira, these shrubs become less plentiful. The large mass breaks into clumps, between which various grasses and other herbaceous plants form a pasturage for cattle, and the more humble *Menziesia polifolia* bespangles the ground. Higher still, the shrubs are reduced to single and stunted bushes; and, at last, at the rim of the Caldeira, they cease altogether; the ground being there covered with a thick elastic mass of grass and moss. *Serapias cordigera* occurs rather frequently above Flamingos, and *Erythræa diffusa* much more so. Between Flamingos and the Caldeira, chiefly in the ravines or on banks facing from the sun, I observed species of *Bellis*, *Luzula*, *Lysimachia*, *Carex* and *Cardamine*, which were unknown to me, but to which Mr. Guthrie has attached names on the labels distributed with his specimens. *Tormentilla officinalis* and *Fragaria vesca* were among the commonest plants on the declivities of the mountains.

But I must now rest my pen here, without taking you and it into that lovely valley of the Caldeira, so interesting to the botanist, so delightful to the lover of scenery. The Caldeira of Fayal, the Peak of Pico, the waterfalls of Flores, and the precipice of Corvo, are the four most inviting localities for the botanist who visits these more westerly of the Azorean islands. Another day I shall be happy to send you some account of them, as well as a full list of the plants collected; to which, the geographical position of the islands, so far in the Atlantic, must give some interest with the readers of the *Journal of Botany*. I may here just remark that there are no indigenous trees in the islands which I visited. The characteristic features of the vegetation consist in the abundance of evergreen shrubs and ferns, with a few peculiar alpine plants. Some of the shrubs are almost arborescent; the stems of the

heath attaining a circumference of two or three feet, and those of the *Juniper* occasionally three to four feet. *Ferns* constitute about a twelfth part of the whole flora, excluding the other cryptogamic plants. Of the genera *Salix*, *Rosa*, *Sedum*, *Sempervivum*, *Saxifraga*, *Statice*, *Linum*, or *Gentiana*, I did not observe a single indigenous species.

(*To be continued.*)

Descriptions of four NEW GENERA OF PLANTS from the ORGAN MOUNTAINS, by GEORGE GARDNER, F.L.S., Professor of Botany and Natural History, in the Andersonian University, Glasgow.

BOWMANIA.

(COMPOSITÆ-NASSAUVIACÆ.)

CHAR. GEN. *Capitulum* multi-60-70-florum. *Invol.* pluriseriale, squamis laxis foliaceis oblongo-lanceolatis ciliatis apice subdentatis æqualibus. *Receptaculum* alveolatum piloso-fibrilliferum. *Flores* omnes hermaphroditi. *Corollæ* bilabiatae, labio exteriori 3-dentato ligulæformi, in floribus exterioribus longiore, interiori bipartito lobis revolutis. *Filamenta* glabra. *Antheræ* basi bisetosæ. *Styli* rami lineares compressi divergentes apice truncati hispiduli. *Achænia* subteretia ovato-oblonga glanduloso-pilosa disco epigyno dilatato coronata. *Pappus* pluriserialis rufus, setis deciduis filiformibus scaber.—Herba *Brasiliana*, *elata*, *tomentosa*, *simplex*; foliis *alternis*, *denticulatis*; capitulis *magnis*, *laxe paniculatis*, *aurantiacis*.

I. *Bowmania verbascifolia*, Gard. Herb. Bras. n. 5797.

HAB. In dumetis, in summitatem montis, *Serra dos Orgãos*, Prov. Rio de Janeiro, Brasiliæ. Aprili florebat.

Herba 4-6 pedalis. *Caulis* simplex, erectus, angulato-striatus, dense lanuginoso-tomentosus, usque ad apicem distanter foliosus. *Folia* alterna penninervia, subamplexicaulia, lanceolata, subacuminata, basi in petiolo dilatato attenuata,

one in Japan, &c, as *Decumaria* by *Schizophragma*, *Schizandra* by *Sphærostemma*, *Hamamelis* by *Corylopsis*, &c. I have elsewhere alluded to this subject, and shall probably consider it more particularly on some future occasion.

(*To be continued*).

Notes of a BOTANICAL TOUR in the WESTERN AZORES. By HEWETT C. WATSON, ESQ. (Continued from page 9 of the present volume.)

IN a former communication, I gave a hasty sketch of my passages to and from the Azores, and first impressions of Azorean botany. Since that letter was written, my collection of specimens has reached England. The species of *Flowering Plants* and *Ferns* amount to three hundred and fifty; and notwithstanding this limited number of species, for Islands in the latitude of Portugal and Greece, I am disposed to believe that the collection will afford a fair approximation towards a Flora, not only of the more westerly isles on which the plants were gathered, but even of the entire group. This opinion is founded in part on the similarity of species seen in the different islands visited by myself; in part, also, on the resemblance between the species gathered by myself and a set of Azorean plants in the possession of Sir W. J. Hooker, who received them from Mr. Guthnic.* The latter collection was formed in the islands of St. Michael, Terceira, Fayal and Pico; mine, in the islands of Flores, Corvo, Fayal and Pico: the two, united, represent the botany of six islands, out of a group of nine islands in the whole; and the number of distinct species in both collections together amounts to about three hundred and seventy. It is highly probable, however, that Sir W. J. Hooker's set of specimens does not include all the species collected by Guthnic and his companion Hochstetter. Terceira, apparently, has supplied most of the twenty kinds of plants in

* This name was erroneously printed Guthrie in the early portion of this article.

their collection which are not included in mine ; while Flores afforded a large proportion of my species which are absent from their parcel sent to Sir W. J. Hooker.

It might be expected by a home botanist, or one who lived on shore while herborizing, that with only three hundred and fifty species, I ought to have brought away a very large supply of duplicates. Yet this is not the case ; for I do not estimate my specimens altogether at more than four thousand, including the smaller Cryptogamous plants, of which, indeed, I possess very few species. On making this estimate of the specimens, when they arrived in England, I was certainly much disappointed at their paucity. I had collected, from the last week in May up to the first week in September ; and had I been living on shore, instead of being on board a ship, it is probable that the specimens dried would have been six times as many. But, as hints for the benefit of other botanists likely to be so impeded, I may here mention the three circumstances which materially lessened the expected results of my exertions. In the first place, the plants dried very slowly, and when their paper was changed there was great difficulty in getting the damp paper made fit for use again. To have scattered the sheets loose about the deck, would have been a great breach of the neatness and etiquette of a man-of-war ; and though I did frequently bring them on deck tied in bundles, the process of desiccation was extremely slow in this condition. The only place in which I could keep loose papers was my sleeping cabin ; and it will easily be conceived that a space of six feet square, which was occupied already by a bed, chest of drawers, wash-stand, table, chair, and botanical presses, could afford no "drying ground" for loose papers. Secondly, my opportunities for collecting were very uncertain. Sometimes, when all my paper was already damp, I could have got an ample supply of specimens ; and at other times, when I had paper dry and ready, a week might elapse without having the opportunity of setting foot on shore. This I had hoped would not have been the case ; but it was so ; and the circumstance was even more provoking, because, in every other

respect, except not finding the expected facilities for botanizing, I had the fullest reason to be satisfied and pleased with the conduct of Captain Vidal and the officers generally. Thirdly, I fell into the error of drawing the straps of my presses too tight, which no doubt rendered the process of desiccation much slower, and considerably injured some of the more succulent specimens. Accustomed to dry plants at home, in an airy room, with usually many quires of paper between each layer of specimens, I had found a heavy pressure advantageous. In a damp climate and ship, where space compelled me to keep a limited supply of paper in use, a heavy pressure was certainly detrimental; though "in the darkness visible" of a sleeping cabin, it was long before I observed the injuries arising from this practice. I can now better understand why specimens come so imperfectly pressed from warm and damp climates, where tight pressure would induce an incipient putrefaction and destroy the distinctness of parts in the succulent individuals. I have, unfortunately, experienced this effect in my semi-succulent species of *Euphorbia*, *Campanula*, and *Convolvulus*, which appear to be undescribed.

To return from a digression which may probably give useful hints to some other collector. My former communication had carried me to the edge of the Caldeira, in Fayal. This was described as a circular hollow in the highest part of the island, and has doubtless been a volcanic crater in long bygone ages: now it is a natural botanic garden, where the true Flora of the Azores, above the cultivated region, reigns undisturbed by plough or spade. The diameter of the basin appears to be about one mile, and its perpendicular depth is more than a quarter of a mile, with very steep sides or walls, down which several small streams rush rapidly, forming beautiful cascades in places where they fall over precipitous ledges of rock. Ultimately, these streams are absorbed in a lake, which occupies about a third of the base of the valley; and from which, as before stated, there is no visible outlet for the waters which are constantly pouring into it.

The summit, or rim, of the Caldeira varies from 1,200 to 1,500 feet above its base; the height of the most elevated point of the rim (which is also the loftiest part of the whole island of Fayal) being 3,170 feet above the sea, and the base of the Caldeira, consequently, about 1,670 feet above the sea. During our stay near Fayal, this Caldeira was scarcely ever clear from clouds or mist for an entire day; and, mostly, it was completely enshrouded during the day, though, not uncommonly, clear for some hours at night, or very early in the morning. Rain falls here frequently, while the lower parts of the island are perfectly dry and sunny; and when no rain is actually descending, the vegetation is often bedewed with moisture from the heavy mists.

The depth of this small valley, and the prevalence of mists over it, must necessarily reduce its share of sunshine to a very slender allowance; while its high and steep walls probably cause an almost constant calm at the base, though the winds of the Atlantic may be sweeping vehemently over their summit. Add to these peculiarities, a plentiful supply of humidity from the streams and spray of waterfalls, coursing down the deep gulleys that are formed in the walls, and it will readily be conceived that the Caldeira is exactly the spot for a natural *Fernetum*. Indeed, so numerous are the *Filices* here, that they give quite a character to the landscape, hanging in profusion about the rocks and waterfalls, and covering the more gradual declivities, among the various *evergreen shrubs* which clothe great part of the sides of the Caldeira, at least in the lower portion of it, for the shrubs gradually become scattered and stunted in the higher parts of the walls, and finally cease near their summit; as was remarked to be the case on the much more gradual ascent from Flamingos to the rim of the crater outside. I made no separate list of the plants seen in the Caldeira, which are almost all of them found also in the various ravines of the mountains around it outside; but the great advantage to a botanist is, that they are here collected into a small space, so that he can, in one day, within the Caldeira, find the species which would occupy his

time during research for several days, if looked for outside the basin. I lost much time by not being sooner aware of this circumstance.

The shrubs which are most abundant in the Caldeira are *Erica scoparia*, *Juniperus* (species unascertained), *Myrsine retusa*, *Laurus Canariensis*, and *Vaccinium Maderense* (or *padifolium*). Though the flowers of this *Vaccinium* are much longer than those of the Madeira specimens, I am disposed to regard the Azorean plant as the same species; not detecting any other well marked difference. *Viburnum Tinus*, *Hedera* (*Helix*?), *Ilex Perado*, and a handsome shrubby *Euphorbia*, also occur among the more abundant species first named. This *Euphorbia* is nearly allied to *E. mellifera*, but is much larger in all its parts, and more especially in its leaves. It grows like a great forked candelabrum, with long and stiff branches, which terminate in tufts of darkly glaucous leaves and umbels of yellow flowers.

Among the *Ferns*, as far as my recollection serves, the most conspicuous for their size or frequency were *Woodwardia radicans*, *Pteris arguta*, and *aquilina*, *Aspidium feniseeii*, and *angulare*:—*Trichomanes speciosum*, *Hymenophyllum Tunbridgense*, *Cystea fragilis*, *Acrostichum squamosum*, and *Asplenium monanthemum*, though less conspicuous, were plentiful enough in many places, on wet and shady rocks. *Lycopodium suberectum* may also be gathered in the Caldeira; and here only did I see any species of *Equisetum*, the few barren fronds found apparently belonging to *E. fluviatile*.

Ranunculus cortusæfolius, *Cardamine Caldeirãria*, *Sanicula ciliaris*, *Senecio malvæfolius*, *Bellis Azorica*, *Erythræa diffusa*, *Veronica* (No. 158 of my specimens), *Rumex* (No. 216), *Luzula* (No. 254), *Carex sagittifera*, and other species of the same genus, were also observed in this Caldeira, and may be regarded as the Alpine plants of Fayal.

At the base of the Caldeira, about the lake, were several British species which are commonly found in wet or damp places in this kingdom, namely, *Mentha rotundifolia*, *Cerastium viscosum*, *Callitriche verna*, *Peplis Portula*, *Veronica*

Anagallis, *Potamogeton natans*, *Juncus effusus* and *Scirpus Savii*. In Fayal, where the low grounds consist of porous rocks, which allow very little water to remain on the surface, the marsh productions thus associate with the alpiners; and these alpiners are several of them large plants, unlike the diminutive growth of the Scottish Highlands. To these species we may add *Sibthorpia Europæa*, *Tormentilla officinalis*, *Fragaria Vesca*, *Lysimachia nemorum*, (or *L. Azorica*), *Cotyledon Umbilicus*, and *Thymus cæspititius*, as farther souvenirs of the Flora of the Caldeira; and generally that of the hilly parts of the island.

Some other plants also occur on the hills between Flamingos and the Caldeira, which I do not recollect to have seen within it, though it is likely enough that they may be most of them found there, if sought for; namely, *Dicksonia Culcita*, *Asplenium anceps*, *Juncus ericetorum*, *Serapias cordigera*, *Festuca jubata*, *Tolpis macrorhiza*, *Nephrodium molle*, *Holcus mollis*, *Rubia splendens*, *Hypericum grandifolium*, *Aira caryophyllea*, a handsome (but yet unascertained) species of *Solidago*, a *Habenaria* allied to *H. viridis*, a new *Carex*, to which Dr. Boott has attached the specific name of *Watsoni*, and some few more plants. *Menziesia polifolia* is extremely abundant on the hills, and was also, I think, seen in the Caldeira. *Calluna vulgaris* and *Myrica Faya* are plentiful in places above Flamingos. A *Rubus*, with larger flowers than our native species, also occurs locally.

Among the more interesting productions of the lower parts of the island, and not mentioned in my former letter, may be enumerated the following; namely, *Solanum pseudo-capsicum*, *Physalis pubescens*, *Frankenia pulverulenta*, *Arenaria macrorhiza*, *Lathyrus Tingitanus*, *Trifolium Ligusticum*, *Dorychnium parviflorum*, *Asplenium palmatum*, *Gymnogramma leptophylla*, *Lythrum Græfferi*, *Chrysanthemum Myconis*, *Microderis rigens*, *Bidens leucantha*, *Cyperus badius* and *C. esculentus*, *Gaudinia fragilis*, *Festuca petræa*, *Juncus tenuis*, and *Urospermum picroides*. *Laurus Indica* and an *Olea*, allied to *excelsa*, are doubtful natives.

Several of the names thus mentioned will be unknown to most botanists. They have been obtained from the labels of Guthnic's collection, or are the appellations conferred on the same species in Madeira, by the Rev. Mr. Lowe, and kindly communicated to me, with numerous specimens from Madeira, by Dr. Lemann, from whose extensive knowledge of plants, and more particularly of the productions of the Atlantic islands and the Mediterranean coasts, I have derived great assistance in determining many of those collected in the Azores. While alluding to Mr. Guthnic's collection, I may correct a misprint of his name, which runs through the whole of my former communication; the name having been printed Guthrie, probably in consequence of my spelling it Guthnic, though Guthnick may be the proper orthography.

The genera of Fayal plants, which yield species that I have not yet been able to refer to described species, are *Convolvulus*, *Carex*, *Euphorbia*, *Luzula*, *Veronica*, and *Rubus*. There are also species of *Carex*, *Cardamine*, *Bellis*, *Festuca*, *Sanicula* and *Lysimachia*, which have been named, if not described, by Lowe, Guthnic, or other botanists.

Notes on the Distribution of the PLANTS OF ABERDEENSHIRE in relation to altitude, by G. DICKIE, M.D., Lecturer on Botany in the University and King's College of Aberdeen.

IN studying the Distribution of Plants, in relation to Altitude, it is important to bear in mind the different agencies by which they may be removed, even to a considerable distance, from their natural places of growth; in short, it is necessary to distinguish between what may be called *natural* and *accidental* stations.

When one meets with patches of *Urtica dioica*, *Cerastium viscosum*, &c. in the Highlands, at a distance from any habitation, it will generally be found that the ruins of some former smuggling hut are not far off. For the most part, however, plants of the low country are not so liable to make

sometimes bipartite, under-side pale-coloured, full of concave dots (stomata.)

Species. 1. *K. æsculifolia*, Blume. 2. *K. Assamica*, Griff.

Illust. Hook. gen. fil. t. 59. A. Hook. et Grev. ic. fil. t. 229. Hook. Journ. of Bot. 2, t. 11, 12.

Obs. Few instances have been detected of this remarkable genus. The original species was found by Blume in Java, and recently by Cuming in the Island of Leyte, where only one plant was noticed; a second species has lately been discovered in Assam by Mr. Griffith.

Kaulfussia, in habit, venation and the position of its sporangia, presents much similarity to *Drynaria plantaginea*, *Aspidium trifoliatum* and *Hypoderris Brownii*; while the structure of its sporangia denotes its place to be in this division, and like *Marattia* and *Danæa*, the multilocular or compound sporangium may be viewed as formed by the union of from ten to twelve oblong sporangia, sessile round a punctiform receptacle, which being concrete, forms one mass, constituting a multilocular or compound, rotate sporangium, each cell opening interiorly as in *Angiopteris*.

Notes of a BOTANICAL TOUR in the WESTERN AZORES.

By HEWETT C. WATSON, ESQ. (Continued from page 125 of the present volume.)

AN ASCENT OF THE PEAK OF PICO.

The island of Pico was not surveyed during the summer of 1842; but while the *Styx* lay at anchor in the Bay of Horta, in the neighbouring island of Fayal, I had two opportunities of joining parties made from that vessel for the ascent of the Peak; which is by much the loftiest of the hills in the Azores, and consequently affords good illustrations of the influence of elevation in modifying their vegetation.

On the first occasion, which was on the 30th of May, two of the Lieutenants, the Assistant Surgeon, and myself, formed the party; but having started from the vessel on a dull and unfavourable morning, we had scarce accomplished one-third of the ascent, before the increasing violence of the wind, the driving rain, and the dense mists in which we were enveloped, became obstacles sufficient to baffle our efforts. We persevered so long as to spend a highly uncomfortable afternoon and night in a low cave which afforded some partial shelter from the rain and wind; but were compelled the next morning to give up our struggle against the continued bad weather, and to return to the ship.

A second and successful attempt was made on the 1st of July. The party from the *Styx* consisted of Captain Vidal, with Lieutenant Cleaveland and myself, who intended to ascend the mountain, and Assistant Surgeon Speer, who remained on the shore to register the barometer for comparison with a second instrument which was to be carried to the summit.

The Peak being perfectly clear from clouds on the 30th of June, we crossed to the island of Pico in the afternoon of that day, with the design of commencing our ascent early the following morning. We borrowed for the night a handsome house built on the shore of Pico, by Mr. Dabney, of Fayal, Consul for the United States, in which he and his family are accustomed to spend a part of each summer. At this time, however, the house was unfurnished; and not having brought any beds with us, we found the experiment of trying to sleep on the floor, or on the wooden frames of sofas destitute of their cushions, to be a very bad overnight preparation for the laborious march of the following day.

As daylight spread over the shores of Pico, on the morning of the 1st of July, we had the uncheering prospect of a dense canopy of clouds extending across the island and completely shrouding the Peak from our view. Apprehensive that he could obtain no good observations with the theodolite, Captain Vidal appeared greatly disposed to return to the ship,

without attempting an ascent; and if any other voice in the party had expressed a similar inclination, this other attempt would probably have been abandoned. But our half dozen natives who had been engaged as guides and porters, were all in favour of making a trial, in expectation of the day clearing up shortly; especially since it signified little to them whether we reached the summit of the mountain or not, so that their time and services were paid for. Some feeling that a partial ascent only would still be productive of botanical interest and acquisitions, probably influenced my own opinion and wishes to chime in harmony with those of the guides; but I also entertained tolerably firm conviction that the upper part of the Peak would be found clear, having frequently observed, during the preceding month, that the stratum of clouds seldom covered more than a third of the mountain in its perpendicular height, and that the summit was left bright while the clouds hovered low down on the flanks. After some time spent in hesitation we at length started, about five o'clock, taking with us the various necessary instruments, a store of provisions, thick coats to wear in the night, and also two beasts of great rarity in Pico, namely, a pony and an ass, which had been considerably procured for us by Mr. Dabney, and which we bestrode in turn while ascending the lower part of the hill. The extreme trepidation exhibited by the women and children, whom we met in the road, while mounted on these animals, showed unequivocally how little they were familiar with the appearance of such creatures.

The first part of our route carried us for a short distance along a bare and rocky shore. In the vicinity of Mr. Dabney's house I observed a few plants of *Hyoscyamus Canariensis*, being the only spot in which it was found during my walks about the islands. Shortly bending our course inland and upwards, we travelled for some miles along a rough road, partly paved, but mostly floored by the natural and very uneven surface of the rock, ground into deep ruts by the wheels of the small bullock waggons which are the only conveyances

in the island, and whose wheels of solid wood, studded with bosses of iron round the rim, grind channels in the lava not unlike the deep ruts seen in clayey lanes in England.

The road was flanked on both sides, by an interminable net-work of *vineyards*; almost the whole surface of the country being here divided by low stone walls into small compartments, varying considerably in size, but often about three yards wide by ten or fifteen yards in length. Within these compartments the vines are planted in crevices of the rock or between loose blocks, which are scantily clothed with weedy herbage. Among the weeds, *Briza maxima*, *Polycarpon tetraphyllum*, *Galactites tomentosa*, *Gnaphalium luteo-album*, *Gastridium lendigerum* and *Bromus Madritensis* were frequent species. The monotonous continuity of the vineyards was partly broken and relieved, immediately adjacent to the road, by the small gardens attached to many of the cottages.

Besides the *vines* there were some *apricot* trees, with fruit nearly ripe and very small, also numerous *fig* trees and *peach* trees, thickly covered with young fruit, but very few *oranges* or *lemons*. On the opposite coast of Fayal, which faces south-east, and has a good depth of mould produced by the decomposed lava-rocks and cinders, the *orange* and *lemon* trees are numerous, while comparatively few *vines* are cultivated, except to form shady walks in the gardens, when trained over trellis work. It is worthy of note, however, that the fruits of this part of Pico (although it is that declivity of the lofty peak, which faces nearly north,) are ripe earlier than those of Horta, which is built, as before stated, on the south east base of a range of fertile hills, and not ten miles distant. Probably the dark lava-rocks and walls of Pico, sparingly covered with vegetation, and thus often heated strongly by the rays of the sun, may be the chief cause of this peculiar result. *Erodium malachoides* and *Heliotropium Europæum* were gathered in small quantity by the road side, in the lower part of the region of vines; and this was the only spot in the Azores where I found these plants.

On attaining some elevation, that is, about a thousand feet above the sea by rude estimate, the *orange* had disappeared; *fig* trees had become more numerous than below; and the *vines* were giving place to *apple* trees, of stunted size, and producing small fruit of little flavour, as I afterwards ascertained, for at this time the fruit was not full grown. *Vineyards* were thus changing into *orchards*, not by any abrupt transition from one to the other, but by the substitution of the *apple*, for the *orange*, *vine*, *fig* and *peach* in succession; while the appearance also of patches of *cocos* or “*yams*” (*Caladium*) and *potatoes*, which were scarcely seen lower down, indicated a transition from orchards to field crops. At first we saw occasional patches of these vegetables, interspersed with the fruit trees. Higher up, indigenous shrubs took the place of planted fruit trees; single bushes or clumps of *Laurus* (*Canariensis* or *Barbasana*?) *Myrica Faya*, *Myrsine retusa*, *Erica scoparia* and *Juniperus* (*communis*?) being left to grow on stony or rocky spots that were unsuitable for the cultivation of the tuber-bearing vegetables just named.

As we passed across the orchard and potato grounds, *Solanum Pseudo-capsicum* was observed rather frequently by the road side, and *Smilax divaricata* (Solander MSS. in Herb. Banks.) was gathered in one locality among the apple trees, but no doubt quite wild there. *Tillæa muscosa* and *Trifolium suffocatum* were collected in the road, and *Asplenium palmatum* very sparingly on the walls by which it was enclosed. A few tufts of *Calluna vulgaris* were seen about the altitude at which *Solanum Pseudo-capsicum* ceased, and a single plant of *Aquilegia vulgaris*, with a white flower, being the only specimen which I found in the islands.

Somewhat higher, the patches of cultivated ground visibly decreased, and the clumps of native shrubs became larger and closer, finally coalescing into a belt of natural wood, consisting of the *Laurus*, *Myrica*, *Myrsine*, *Erica* and *Juniperus* above mentioned. The road now was becoming more damp and less stony or rocky, and narrowed in places to a mere cattle track between rising banks, which were thickly car-

petted with *Tormentilla officinalis*, *Fragaria vesca*, *Prunella vulgaris*, and other small plants of northern Europe. Ferns became plentiful here, including *Pteris arguta*, *Allantodea umbrosa*, *Balanium Culcita*, *Aspidium fœnesecii* and some others. *Luzula elegans* (of Guthnick, not of Lowe) was frequent; and the pink or pale purple colour of its flowers rendered it much more ornamental, than any of our own native species. On shaded banks, where the road became a sort of gully, I gathered *Bellis Azorica* (Guthnick's collection), *Lysimachia Azorica* (Hornemann), *Erythræa diffusa* (Woods), and *Lycopodium suberectum* (Lowe). The long flowered form of *Vaccinium Maderense* (which is *V. cylindraceum* of Smith) was pretty frequent on the banks by the road side, and highly ornamental. A few plants of *Daphne Laureola* were also observed, and *Hypericum foliosum* (Aiton, which is *H. grandifolium*, Chois.) was rather plentiful, though not yet in flower.

As we continued to ascend, the narrow belt of natural wood, which was formed by the evergreen shrubs interspersed with ferns again became broken into clumps; the intermediate spaces being now covered by a grassy sward, with many small pools of stagnant water, which gave an abode to *Scirpus fluitans*, *Scirpus Savii*, *Carex stellulata*, *Callitriche verna*, *Peplis Portula* and *Potamogeton natans*. Though very small and shallow, these pools are kept supplied with water by the mists and clouds from which this part of the mountain is seldom quite clear. Among the short grass here, I noticed *Bellis Azorica*, *Erythræa diffusa*, *Carex Azorica*, and *Carex sagittifera*, all plentiful. *Fragaria vesca* and *Tormentilla officinalis* (passing into *T. reptans*) were extremely abundant, as, indeed, they are almost every where in the islands above the height of a thousand feet, though scarcely seen in the low grounds near the coasts, except under the shade of rocks.

On getting more completely within the region of clouds and moisture, all the shrubs ceased except *Erica scoparia*, which still grew in scattered patches, and attained a height

of six or eight feet, giving shelter to *Hymenophyllum Tunbrigense* and *Acrostichum squamosum*. *Aspidium fœnesecii* was still plentiful, but most of the other ferns seen lower down were now lost. This clouded region corresponds with the higher part of the hills and Caldeira in Fayal, being at once the region of alpine and of marsh plants; and the lower zone of it being also the most productive of *Ferns*. But the better and more comprehensive designation is that of the *Region of Clouds*; since the absence of cultivation, the green pasturage, and the prevalence of small marsh and boreal plants, interspersed with some of the peculiar alpine productions of the Azores, are all apparently attributable to the clouded condition of the atmosphere.

At length the *Erica scoparia*, that most frequent shrub of the Azores, itself yielded before the cloudy atmosphere, and we crossed a space of the hill quite destitute of shrubs, but covered with a close short herbage, consisting chiefly of *grasses*, *Carices* and *Torméntilla reptans*. Here Captain Vidal remarked that we had already ascended above the limit of the heath. Though I could not dispute the apparent fact, yet I felt convinced we were not truly above the natural limit of heaths, since the fronds of *Pteris aquilina* were conspicuous around us, rising above the very short pasturage. *Calluna vulgaris* had been observed lower down the Peak; and as that heath ascends in Scotland far above the *Pteris aquilina*, I read the appearance of the latter as a fair indication that we were still within the natural limit of heaths, so far as determined by absolute elevation; but the mist was here too dense to allow the sight of any thing beyond a distance of fifty yards. Accordingly in no long time, as we gained increased elevation, and a less clouded atmosphere, (probably between four and five thousand feet of altitude), scattered and very dwarf bushes of *Erica scoparia* again greeted our eyes, interspersed with a few examples of *Daphne Laureola* and tufts of *Aspidium fœnesecii*, together with occasional specimens of *Lycopodium Selago*, whose close and upright branches give it a totally different appearance from

the curved and straggling habit of *L. suberectum* seen lower down the hill.

Higher still, as we ascended above the clouds, and attained an elevation that gave us a full view of the upper part of the Peak, now seen rising into a clear blue sky as anticipated, several other shrubs re-appeared which had been also seen below the region of the clouds; and we soon found ourselves crossing a much drier and more stony portion of the mountain, which was thickly covered with the species of *Erica*, *Juniperus*, *Myrsine* and *Vaccinium*, before mentioned. Apparently, this upper zone of wood had been the growth of a long series of years, although the shrubs were much smaller in their dimensions than those of the same species in the lower wooded zone, just below the region of clouds. *Calluna vulgaris*, and *Menziesia polifolia* (the dwarf variety figured in Loddiges' Botanical Cabinet) were interspersed in a few places between the larger shrubs, over spaces from which the latter had probably been burnt or cut and carried away.

Here we saw a number of women and children, employed in burning this natural cover of shrubs; but I omitted to ask whether their work was done in the expectation of producing pasturage for sheep, or whether there was some other object in view. If the former, I should deem it likely to prove labour thrown away, so bare and stony was the steep acclivity here, and so nearly destitute of water at this season. Whatever might be the object, there must have been much time spent in walking to and from the scene of their labour, the uppermost houses being quite within the limit of the cultivated region, distant by a walk of two or three hours.

It was now about noon, and we halted half an hour in this upper natural zone of shrubs, for the guides to eat their dinner, and for ourselves to make a lunch before commencing our ascent of the remaining and very steep portion of the Peak. Our resting-place was fixed by a small hollow in the rock, which held a gallon or two of water, and which slowly refilled itself as we abstracted the water from it, yet never overflowing. Here we found it advisable to leave our

basket of provisions and sleeping coats, with other heavy articles, not indispensable to the objects of our ascent. Among these, I included my collecting-box, which had become rather weighty, and the contents of which were more likely to be injured by the burning rays of a cloudless sun, than to be increased from the dry and barren rocks still above us.

On again getting into motion, we slowly toiled up the shoulders of the mountain, and soon left below us all shrubs except *Calluna vulgaris*, which, with *Thymus cæspititius*, composed the principal part of the vegetation. Considerable spaces of bare rock, or of loose cinder-like stones, intervened among the portions of surface covered by the prostrate *Calluna*; and as these bare spaces gradually increased in extent and frequency, with the increasing altitude, almost the whole surface at length appeared to be destitute of vegetation. Only two species of flowering plants were observed within or below that region; the one being *Polygala vulgaris*, of which only a single root was seen on the Peak, and none elsewhere in the islands which I visited; the other was a species of *Agrostis*, possibly a form of *A. vulgaris*, afterwards picked just by the summit of the Peak, and nearly parched with drought.

The task of ascending this uppermost portion of the Peak was exceedingly toilsome. In many places the surface was covered by loose pieces of lava, which, when set in motion over each other by our feet, slipped rapidly down the steep declivity, endangering the freedom of our ancles and the integrity of our bones. The dark and bare rocks also were sensibly hot to the hands and feet, even felt through our shoes, under the influence of the mid-day sun, shining in full splendour through a dry and rarified atmosphere. Not a drop of water was found above the place at which we had rested to lunch; and all the portable stores that we had carried higher, consisted of a bottle of cyder and a very small flask of whisky, for we had expected to find water, if not snow, near the summit. We had soon cause enough

to repent this bad management; thirst becoming painfully excessive, under the united influence of heat and great muscular exertion, more especially to the three Englishmen. The natives bore this better than we did, but one of the four guides or porters, who were still ascending with us (two having been left in charge of our baggage at the resting-place), was at length fairly knocked up, and he returned without reaching the summit.

The top of the Peak is a large hollow crater, out of which arises a smaller cone, of two or three hundred feet in altitude, produced by some eruption more recent than that which formed the chief crater itself; and the upper part of this little cone constitutes the pointed summit of the Peak, as seen from the ocean. Before reaching this crater, we lost the *Calluna vulgaris* entirely, but a few tufts of *Thymus cæspititius* were still visible, and continued to be seen even to the summit of the little cone. The crater is now imperfect, the sides having fallen down; but a considerable portion of the walls, too steep for the foot of man, still surround it with black and bare precipices. We crossed the crater, from which all snow and water had vanished, and gained the base of the small cone; and up this cone, nearly as steep as a sugar-loaf, we at last scrambled. I cannot say we walked up it, for hands were almost as serviceable as feet in effecting the ascent.

The summit of the small cone, or extreme summit of the Peak, is again the edge of a crater, there being a basin-like depression within it. Inside this basin, or little crater, the ground was hot and steaming, and at the depth of a few inches below the surface of loose stones, it was too hot to allow of the hand being pressed against it. We remained on the cone two or three hours, and while exposed to the wind, by standing on the edge of the basin, we speedily became so chilled as to tremble with cold, though Fahrenheit's thermometer indicated a temperature of 53° , the only instance in which I saw the thermometer so low during my stay about the islands. On descending into the small crater

deep enough to be screened from the wind which swept over its summit edge, the climate was changed into a pleasant hothouse warmth, by the heat of the ground and the steam which rose from it. Here I felt quite comfortably warm while sitting on the rock without a coat, my own having been transferred as an outside coat to Captain Vidal, whose observations with the theodolite obliged him to stand on the exposed summit. He had made the ascent in a thin and light jacket, which had been exchanged for a coat of woollen cloth, before taking his exposed position; but after the heat and exertion of the ascent, the breeze of the summit would have made a thick cloak welcome, although the sun shone clear and the ground was warm.

On arriving at the summit, we had divided and drunk the bottle of cyder, and found it little enough for six parched tongues, and for lips painful from excessive thirst. But after remaining so long about the summit, the small flask of whisky had become at least equally valuable as another bottle of cyder might have been deemed, could it have been offered to us. The painful thirst, and intense longing for cool or bland drinks, such as cyder or milk, again returned in full intensity as we descended towards the spot at which we had rested for lunch, and near to which our sleeping ground was to be chosen for the night. The dark and steep sides of the hill, where there was so much bare rock, caught the rays of the declining sun, like a wall, as we descended the north-western declivity, and thus kept up the heat till sun-set.

While descending from the summit I felt too much wearied and worn out for botanical observations: indeed, I had scarcely an eye for any thing except spots which appeared in the distance likely to produce water, and for which I was vainly looking around at every downward step. Small channels were occasionally crossed, through which water had been flowing earlier in the season, but now all was dry and parched. Six weeks before, M. Dabney had sent a party of men to the summit, to obtain snow for a sick friend, and they had then procured some; but all trace of snow was

now gone, and we had ample proof of the inaccuracy of those geographical works, which describe the Peak of Pico to be covered with perpetual snow. Snow lies till the month of May under some of the steep rocks that form the large crater, but on this first day of July snow and snow-water were no longer to be seen. The summit of the Peak is 7616 feet above the level of the sea, as afterwards calculated by Captain Vidal from the barometrical observations. The difference of temperature between the base and summit was about 22° of Fahrenheit.

Thymus cæspititius and the *Agrostis* before mentioned were the only phænogamous plants seen on the little cone; and a very few *mosses* and *lichens* were associated with them. I should think the highest tufts of *Calluna vulgaris* were met with at an altitude of about 7000 feet. *Erica scoparia* was the second shrub observed in the descent, and might attain a height of 6000 feet. I should guess the spot at which we halted for the night to have been about 5000 or 5,500 feet in elevation. Here we were in the upper zone of shrubs, including *Vaccinium Maderense*, *Myrsine retusa*, *Menziesia polifolia*, and (if I remember rightly) also the *Juniperus* (*communis*?) and *Daphne Laureola*, along with *Erica scoparia* and *Calluna vulgaris*. Below this place, the *Calluna* was very sparing in quantity. We formed our beds with green bundles of the *Erica*; and having made a good fire with the dead and dry branches of the shrubs, we passed the night more comfortably than the preceding night on the deal boards in Mr. Dabney's house. Pilot-coats and a good fire were by no means unnecessary while we slept under a clear sky after the day's labour. About sunrise we were scarcely two hundred feet above a dense mist, but during the whole night the heavy masses of mist or cloud, which enveloped the middle portion of the mountain, remained constantly below us. The sun rising on the contrary side of the Peak to that on which we had slept, threw the conical shadow of the hill, deep and distinct, over the volumes of white cloud beneath us, and thus told us that it had risen, long before

we could see the luminary itself. We made a rapid descent through the mist, and found the bushes and grass dripping wet until we got below it, when we came into a fair and sunny morning on the lower part of the mountain, and arrived at the house of Mr. Dabney before nine o'clock. The whole ascent and return had thus occupied us for about twenty-eight hours, or excluding the night, and the time spent in the observations with the theodolite, a space of fifteen or sixteen hours. The entire ascent and return might therefore be made in one day; indeed, it was accomplished in a day by two English gentlemen, who ascended on the last day of June.

I regret not being enabled to state the exact heights at which the various species of plants mentioned, commence and cease. I was of course much tied by accompanying a party who ascended for a different object. Captain Vidal wished only to ascertain the absolute height of the Peak, and the relative position of other islands, or other parts of the same island, as seen from the Peak. On this account, I was unable to avail myself of an opportunity, which might, under other circumstances, have been afforded, for ascertaining also the altitudes at which the shrubs and other plants grow, whether indigenous or cultivated. The highest cultivation, that of the potatoe and cocoa, probably did not exceed 2000 feet. Neither, of course, did a rapid ascent and return allow much time for looking about after plants beyond the line of march, without risk of losing the party. It is highly probable that the lower wooded zone would repay a more careful scrutiny, and prove more interesting to a botanical collector than the ascent to the actual summit of the Peak.

On one other occasion I crossed to Pico again for a few hours, and landed at a different part of the coast, to ascend one of the small hills, or volcanic cones, formed by some eruptive burst of cinders and lava near the base of the great mountain. I got thoroughly soaked from head to foot by the heavy rain, which commenced almost as soon as I landed, and almost prevented my botanizing. On this oc-

casion I collected *Corema alba* and *Bartsia Trixago*, both on the cone ascended, and neither of which did I find elsewhere in any of the islands visited; also *Triticum ciliatum* and *Myosotis maritima*, found elsewhere by Guthnick, but only on this part of the coast of Pico by myself. *Rhus Coriaria* was likewise gathered on the volcanic cone, and apparently indigenous there, though other localities in which it was observed, in the islands of Fayal and Flores, were all near houses or gardens, and to which I deemed it to have been introduced by the hand of man.

It may be here observed, that the names which are applied to some of the plants mentioned in these notes, may be disputed by other botanists. The shrub which I have called *Vaccinium Maderense*, is certainly the *V. cylindraceum* of Smith; but I cannot regard it as being specifically distinct from *V. Maderense*, of which, however, it is a very handsome variety, with flowers more numerous, and often twice the size of those in the Madeira specimens. Those botanists who delight in multiplying species on paper, by describing extreme forms, in disregard of intermediate and connecting links, will doubtless keep *V. Maderense* and *V. cylindraceum* distinct. The *Daphne Laureola* of these notes is the same as the plant marked "*Daphne, n. sp.*" on the labels of Mr. Guthnick, and I supposed it a different species when collected; the more spreading branches and shorter leaves inducing a dissimilarity of aspect from the upright shrubs of our hedgerows and coppices; but as I detect no essential distinctions in the dried specimens, the different mode of growth may perhaps be ascribed to the influence of elevation and exposure to violent winds. The *Lysimachia Azorica* (of Hornemann) is possibly a variety of *L. nemorum*, which it closely resembles. The specific character assigned to it in the Botanical Magazine was drawn from plants cultivated in a pot, and is inapplicable to the wild specimens, the stems of which are not erect, and are larger, stronger, and more branched than those of our indigenous *L. nemorum*. Perhaps the best distinction lies in the broader sepals of *L. Azorica*,

which are incorrectly figured in the Botanical Magazine. The *Juniperus* may be only one of the many varieties of *J. communis*. It differs from the form of that species which is indigenous in Britain, by having an almost arborescent growth, the stems attaining three or four feet in circumference, broader leaves not at all subulate: in the latter respect, it approximates to *J. nana* of our mountains. The name of *Bellis* *Azorica* is taken from Mr. Guthnick's labels; but while the plant closely resembles our *B. perennis*, in its leaves and general habit, the receptacle is almost flat, and is covered by short broad scales; so that the generic character is not that of a *Bellis*. The *Erythræa diffusa* is a proteiform species, but the specimens collected on Pico are readily distinguished from those of our native species, by their prostrate stems, elongated peduncles and perennial root. The plant is common on the hills in all the islands visited, and invariably white-flowered, though the French specimens, on which the species was founded, produce pink flowers. A tendency to the production of white-flowered species and varieties seems a characteristic of the botany of the Azores. The name of *Myosotis maritima* is also taken from the labels of Mr. Guthnick. It is an undescribed species in this country, apparently annual, and nearest our *M. arvensis*, but with much larger and paler flowers than the latter. The *Luzula* of the Azores approaches our *L. maxima* in size and habit, while that of Madeira, described by Lowe under the name of *L. elegans*, more resembles the British *L. pilosa*. Both species differ conspicuously from our indigenous species in the colour of their flowers, which are pale purple. I suppose that Lowe has the priority in the name of his Madeira species. If so, that of the Azores might be named *L. Azorica*.

pale tawny by age, on alate footstalks, once or twice dichotomous, the lobes oblong, rounded, deeply dentate, having a very shallow sinus at the tops; their substance is thin, the cellules very distinct. Calyx situated towards the base of the frond, on the under side of the nerve, having three or more lacinated scales, from the bosom of which rises the linear elongated calyptra bearing pistilla on its summit. Capsule large, conspicuous, cylindrical, splitting with the tops of the valves at first cohering; spiral filaments very long, bent, often twisted together, capsule one tenth of an inch long. On distinct individuals are perigonia of numerous, imbricated, convex, dentate scales. From *J. Hymenophyllum*, Hook., ours is distinct by the stipes rising at once from the ground, the wider and more dentate lobes.

(*Metzgeria*, *Nees v. Esenbeck.*)

20. *J. furcata*, L.

HAB. Van Diemen's Land.

MARCHANTIA, L.

21. *M. polymorpha*, L.

HAB. Van Diemen's Land.

Notes on the BOTANY of the AZORES. By HEWETT C. WATSON, Esq.

(Continued from page 125 of Vol. II.)

After returning from the Azores, about two years ago, I addressed some letters to the *London Journal of Botany*, as notes of the general impressions retained from my botanical walks on the islands of Fayal and Pico. It was my wish to have continued the notes, by next describing visits to Flores and Corvo, the two most westerly islands of the group. My sketches of Azorean Botany would then have been concluded appropriately by a general list of the species collected on the four islands. It was considered that such an

enumeration would give the opportunity for filling up blanks in names, and for correcting any errors of nomenclature, which might be found in the earlier notes, partly written before my collection had arrived in England, or could be submitted to proper examination.

My progress was arrested, when I learned that a list of the plants collected in the same islands, by Messrs. Hochstetter and Guthnick, in 1838, had been published in Weigmann's *Archiv*. (1843); and likewise, that a more complete *Flora Azorica* was in course of preparation, by botanists much better qualified for the work than I could pretend to be. To have still proceeded with my own notes and list, under these circumstances, must have led to an inconvenient double naming of all the undescribed species which had been gathered by both parties; though the right of priority clearly belonged to Messrs. Hochstetter and Guthnick, whose collections were made four years earlier than mine, and had been distributed with names on their labels.

The expected *Flora Azorica* is now before the public, from the pen of M. Seubert, and it has just (September, 1844) reached my hands. This work, with upwards of a hundred Azorean specimens, sent by Guthnick to Sir W. J. Hooker, includes all that I have been able to see relating to their observations and collections in the islands. It appears that M. Hochstetter visited all the four small Westerly islands, on which I was enabled to land; as likewise the two principal islands of the group, Terceira and San Miguel, which were not seen by myself. M. Guthnick was his companion on four of the islands. Altogether, six of the islands have been examined partially, and three others apparently remain still unexplored by botanists. The *Flora Azorica* is a catalogue of the species found by Hochstetter and Guthnick on the six islands, with some few additional species, either published in other works, or incidentally mentioned in my former notes.

As might be expected, from the superior facilities enjoyed

by two travellers who lived on shore, and who visited more and larger islands, their collections include many species which do not occur in mine. On the other hand, it seems that I have brought home many species which were not seen by the two travellers. Thus, neither the valuable work of Seubert, nor a list of the species in my own herbarium, taken apart, will afford a full catalogue of Azorean plants, so far as known. Accordingly, I now propose to make a nearer approximation to a complete Azorean Flora by here combining the two lists into one. The distinctions of the two collections may be easily kept up, by prefixing the Nos. from the *Flora Azorica*, within brackets (1), equally with the Nos. 1, 2, 3, &c., written on the labels distributed with my own specimens. Those species which appear to have been brought in one of the collections only, will be known by the substitution of a blank line, “—” or “(—)” in place of a No.

In enumerating the species, it will be more convenient to adapt the arrangement to my own Nos. which begin with the *Ranunculaceæ*; although they will not appear to have been placed in the best Natural Arrangement. Almost immediately on getting my specimens to England, I was applied to, for sets of them, by two eminent botanists, who were particularly interested in the productions of the Atlantic Islands. This induced me very hastily to put the almost unexamined specimens into something like a natural series, that the Nos. on the labels might correspond in each set, and follow in regular order. The interruptions to natural affinity which have arisen from this circumstance, are not so great as to render any re-arrangement necessary. I had hoped to receive the opinions of both the botanists alluded to, in reference to several of the then undescribed or dubious species. From one of them, Dr. C. Lemann, I have obtained much valuable information, as also many illustrative specimens gathered by him in Madeira. Unfortunately for the accuracy of my list, I have not been equally successful in

obtaining the corrections of P. B. Webb, Esq., which were greatly wished for.

In the following list, the first Nos. will correspond with those on the labels distributed with my own specimens. The second Nos. inclosed () will refer to the *Flora Azorica*. Following the names of the plants, I give those of the islands on which they were collected by myself. In the case of species not found by myself, the names of the islands (with very few exceptions) are omitted, but may frequently be ascertained from the pages of the *Flora Azorica*. Where it appeared necessary or desirable, I have added some notes on the characters of the species, &c. For the convenience of foreigners, these notes are mostly in Latin; but having scarce ever written that language since leaving school, twenty years ago, it will be found "as *bad* as can be expected."

It may be proper here to remark, that some few of the names in the Notes formerly printed, will now require to be changed; and hence it may be well for any botanist, who feels interested in the plants of the Azores, to observe whether the same specific appellation is still retained in the following list. *Holcus mollis*, of my Notes, for example, is properly described as a new species in the *Flora Azorica*, under the name of *Holcus rigidus*; and the former name must consequently be erased, as applying to a species which has not been found in the Azores.

CATALOGUE OF AZOREAN PLANTS.

- ✓ 1 (305). *Ranunculus cortusæfolius*, Willd. Fayal.
By Seubert this plant is named *R. cortusæfolius*, var. *sylvestris* (Webb and Berth.), and *R. grandifolius* (Lowe) is quoted as a synonym. My single specimen of Lowe's plant, collected in Madeira by Dr. C. Lemann, differs considerably from all those of Fayal.
- ✓ 2 (304). *R. repens*, L. Fayal; Pico.
- ✓ 3 (306). *R. trilobus*, Desf. Flores. (Inter Caladia.)
- ✓ 4 (307). *R. muricatus*, L. Fayal. (Uno loco.)

- ✓ 5 (308). *R. parviflorus*, L. Fayal; Pico.
- ✓ — (309). *Nigella arvensis*, L.
- ✓ — (311). *Delphinium Consolida*, L.
- ✓ 6 (310). *Aquilegia vulgaris*, L. Pico. (Indigena?)
- ✓ 7 (—). *Papaver dubium*, L. Fayal; Flores.
- ✓ — (312). *Chelidonium majus*, L.
- ✓ 8 (313). *Fumaria capreolata*, L. Fayal; Flores.
 Varietas minor, floribus purpurascens, pedicellis patentibus. Æque ut in forma typica (pedicellis recurvis) petalon inferius ad apicem parum dilatatum vel amplius est.
- ✓ — (314). *F. officinalis*, L.
 A priore facile distinguenda hæc species apice petali inferioris dilato et suborbiculari. In insulis non vidi.
- ✓ 0 (315). *Matthiola annua*, Sweet. Fayal. (Aliena.)
- ✓ — (—). *Cardamine hirsuta*, L.
 “The Banksian Herbarium contains specimens of *C. hirsuta*, collected by Masson, in San Miguel.”—Dr. C. Lemann.
- ✓ 9 (318). *C. Calderarum*, Guth. Ins. omnibus.
- ✓ 10 (317). *Nasturtium officinale*, Br. Fayal; Flores.
- ✓ — (316). *N. flexuosum*, Seubert.
- ✓ 10^{bls.} (—). *Barbarea præcox*, Br. Fayal. (Aliena?)
- ✓ 11 (—). *Sisymbrium officinale*, Scop. Fayal; Flores.
- ✓ 12 (322). *Sinapis nigra*, L. Fayal; Flores.
- ✓ 13 (—). *Rapistrum perenne*, Berg. Fayal.
 The Fayal specimens differ from those of Madeira, by their shorter styles and the lower joint of the silicle being reduced into a slender pedicel to the upper.
- ✓ 14 (—). *Raphanus Raphanistrum*, L. Fayal; Flores.
 The Azorean specimens have smaller and more distinctly moniliform pods than those of England.
- ✓ 15 (—). *Cakile maritima*, Scop. Fayal.
 Varietas, siliculæ articulo superiore ovato, apice emarginato; inferiore sæpius seminifero.

- ✓ 16 (321). *Lepidium Virginicum*, L. Fayal.
- ✓ 17 (323). *Senebiera pinnatifida*, DC. Fayal.
- ✓ — (319). *Alyssum maritimum*, L.
- ✓ 18 (—). *Reseda Luteola*, L. Fayal; Flores.
Varietas, foliis undulatis, petalis quatuor, inferiore trifido.
- ✓ — (324). *R. macrosperma*, Rchb.
- ✓ 19 (325). *Viola odorata*, L. Fayal; Flores. (Aliena?)
- ✓ 20 (—). *V. palustris*, L. Flores; Pico.
- ✓ 21 (344). *Polygala vulgaris*, L. Pico.
- ✓ 22 (327). “*Frankenia ericifolia*, Ch. Smith.” Corvo.
- ✓ 23 (326). *F. pulverulenta*, L. Fayal; Flores?
- ✓ 24 (336). *Silene Gallica*, L. Fayal; Flores.
- ✓ 25 (335). *S. maritima*, With. Flores. (*S. inflata*, Flo. Azor.)
- ✓ 26 (333). *Cerastium Azoricum*, Hochst. Flores; Corvo.
- ✓ 27 (334). *C. vulgatum*, L. Fayal; Flores.
- ✓ 28 (—). *C. viscosum*, L. Fayal; Flores?
- ✓ 29 (—). *Stellaria media*, With. Fayal; Flores.
- ✓ 30 (—). *Arenaria rubra*, L. Fayal; Flores.
- ✓ 31 (322). “*A. macrorhiza*, Req.” Fayal; Pico.
- ✓ 32 (331). *Sagina procumbens*, L. Fayal; Flores.
- ✓ 33 (—). *Elatine hexandra*, DC. Flores.
- ✓ 34 (337). *Lavatera sylvestris*, Brot. Fayal; Flores.
- ✓ 35 (338). *Malva rotundifolia*, L. Fayal.
- ✓ 36 (—). *M. parviflora*, L. Fayal.
- ✓ 37 (339). *Sida rhombifolia*, L. Fayal; Flores.
In locis calidioribus juxta urbes; an vere indigena?
- ✓ 38 (343). *Hypericum foliosum*, Ait. Fayal; Flores; Pico.
Sect. 1. *Ascyreia*. Chois.—DC. prodr. Ramis (pallidis) teretibus subdipteris, foliis (lætevirentibus) decussatis sessilibus ovato-oblongis: superioribus sæpius majoribus subovatis amplexicaulis acutiusculis, sepalis oblongo-lanceolatis acutis in fructu primum reflexis deinde caducis, capsulis ovatis in stylos persistentes attenuatis.

Hab. in montibus insularum plurium, in Flores frequentissime. *Hypericum grandifolium*, Choisy. *Androsæmum Webbianum*, Spach. The fruit of this species has little resemblance to the baccate fruit of *Androsæmum officinale*, and connects it more closely with *H. perforatum* and our other herbaceous species. Even if the generic name of *Androsæmum* should be adopted for it, there appears no good reason for setting aside two earlier specific names, as done by Spach. Mr. Webb's services to science will not be the less valued and known for the loss of a trivial name. The above diagnosis is drawn from the dried specimens brought home, aided by living plants in my garden raised from their seeds. The characters of *H. grandifolium* and *foliosum* are completely united in the same plant; and Dr. C. Lemann has assured himself of the identity of the two supposed species, by examining an original specimen in the Banksian herbarium. The differences of size and shape in the upper leaves, is sometimes very decided; but in other instances, it is less evident: and such discrepancies occur in other allied species.

↓ 39 (—). *Hypericum decipiens*, H. Wats. ms. Flores; Fayal?

Sect. 4. *Perforaria*, Chois.—DC. Prodr. Herbacea, nigro-punctata, caule erecto tetrapteroramoso, foliis pellucido-punctatis oblongis obtusis retusisve, floribus laxè paniculatis, sepalis lanceolatis acutis, stylis tribus divaricatis ovario longioribus. Corolla lutea (minime citrina), extrinsecus rubicunda. Folia caulina sæpius reflexa margine undulata. Caulis, folia, calyx, corolla, antheræ nigro-punctati. This is extremely near *H. quadrangulum*, (Linn.—Auct. Brit.) though instantly distinguished by its deeper coloured and

less crowded flowers ; and if the tetrapterous stem were not observed, it would more likely be called *H. perforatum* by a British botanist. Still, if it be correct to include *H. dubium* and *maculatum* under *H. quadrangulum*, this also may be added to the assemblage. Dr. Lemann suggested the variety “*undulatum*” of DC. Prodr. 2.548 ; but the only character of that variety “*foliis margine undulatis*” applies to some specimens of *H. dubium* and of the ordinary *H. quadrangulum* of Britain. Probably this is the same as *H. perforatum* of the *Flora Azorica*, which is stated to occur, “*ubique in lapidosis collinis,*” yet was not found by me. My flowering specimens of *H. decipiens* were collected on damp rocks, exposed to the sun, in Flores ; and I possess what is apparently the same species, though destitute of flowers, collected in Fayal. It has been sent to the Botanical Society of London, from San Miguel, by J. C. Hunt, Esq., British Consul there. In my garden, even in dry ground, it is a much finer plant than the British *H. quadrangulum*, which grows in wet ground.

- ✓ — (340). *H. perforatum*, L. (Vide præcedentem).
- ✓ 40 (341). *H. humifusum*, L. Fayal ; Flores ; Pico.
- ✓ 41 (350). *Geranium Robertianum*, L. Fayal ; Flores.
- ✓ 42 (—). *G. molle*, L. Fayal.
- ✓ — (349). *G. dissectum*, L.
- ✓ 43 (348). *Erodium malachoides*, Willd. Pico.
- ✓ 44 (351). *Oxalis corniculata*, L. Fayal ; Flores.
- ✓ — (—). *O. purpurea* ? (St. Michael—J. C. Hunt, Esq.)
- ✓ — (317). *Ruta bracteosa*, DC.
- ✓ 45 (345). *Ilex Perado*, Ait. Fayal ; Flores.
- ✓ 46 (346). *Rhamnus latifolius*, Herit. Fayal ; Flores.
- ✓ 47 (—). *Rhus Coriaria*, L. Flores ; Pico. (Aliena.)
- ✓ 48 (364). *Spartium junceum*, L. Fayal ; Flores. (Aliena.)
- ✓ 49 (365). *S. scoparium*, L. Fayal ; Flores ; Corvo. (Aliena?)

- ✓ 50 (387). *Lathyrus Aphaca*, L. Fayal; Flores; Pico.
 ✓ 51 (389). *L. tingitanus*, L. Fayal. (Indigena?)
 ✓ 52 (389). *L. sativus*, L. Fayal. (Aliena?)
 ✓ 53 (—). *L. articulatus*, L. Fayal.
 ✓ — (383). *Ervum Lens*, L.
 ✓ 54 (—). *E. monanthos*, L. Fayal.
 ✓ 55 (385). *Vicia sativa*, L. Fayal. (Et quoque var. *angustifolia*.
 ✓ 56 (386). *V. albicans*, Lowe. Fayal.
 ✓ 57 (384). *V. (Ervum) gracilis*, Lois. Fayal.
 ✓ 58 (—). *V. (Ervum) hirsuta*, Koch. Fayal; Flores.
 ✓ 59 (369). *Melilotus parviflora*, Desf. Corvo.
 ✓ 60 (370). *Trifolium angustifolium*, L. Fayal.
 ✓ 61 (—). *T. arvense*, L. Fayal; Flores.
 ✓ 62 (371). *T. Ligusticum*, Balb. Fayal; Flores.
 ✓ — (372). *T. lappaceum*, L.
 ✓ 63 (376). *T. repens*, L. Fayal; Flores.
 ✓ 64 (375). *T. glomeratum*, L. Fayal; Flores.
 ✓ 65 (374). *T. suffocatum*, L. Pico.
 ✓ 66 (373). *T. scabrum*, L. Fayal.
 ✓ 67 (377). *T. procumbens*, L. Fayal.
 ✓ 68 (—). *T. filiforme*, L. Fayal; Flores.
 ✓ — (382). *Lotus corniculatus*, L.
 ✓ 69 (382a). *L. major*, Scop. Fayal; Flores.
 ✓ — (381). *L. Creticus*, L.
 ✓ 70 (380). *L. angustissimus*, L. Fayal; Flores.
 ✓ 70^{bis} (379). *L. hispidus*, Desf. Fayal; Flores.
 ✓ 71 (378). *L. parviflorus*, Lamarck? Fayal.

This plant is so extremely like *Lotus hispidus*, except in its dwarf stature and in its short legumes which scarcely exceed the calyx, that I had first mingled the specimens of the two. Afterwards, observing that Mr. Guthnick had labelled his similar specimens "*Dorycnium parviflorum*," and that a Madeira specimen, still apparently identical, had been sent to me likewise under this name, I was induced to change the

number on the labels of the larger specimens, and the name on those of the smaller. Now, I see that Seubert also has referred the specimens of Guthnick to *L. hispidus*. Is this correct?

- ✓ — (366). *Medicago lupulina*, L.
- ✓ 72 (367). *M. denticulata*, Willd. Fayal. (*M. lappacea*, Fl. Az.)
- ✓ — (368). *M. pentacycla*, DC.
- ✓ 73 (391). *Ornithopus perpusillus*, L. Corvo. (*O. roseus*, Fl. Az.)
- ✓ 74 (390). *Arthrolobium ebracteatum*, DC. Fayal; Flores.
- 75 (—). *Prunus Cerasus*, L. Fayal. (Aliena?)
Two bushes only were observed, in a plantation of Pines. They could scarcely be supposed indigenous, although I did not see either this species, or *P. Avium*, in the gardens of Fayal.
- ✓ 76 (356) *Rubus Hochstetterorum*, Seub. Fayal; Flores; Pico.
My No. 77 is apparently a smaller form of the same species.
- ✓ 78 (355). *R. fruticosus*, L. Fayal.
- ✓ 79 (357). *Fragaria vesca*, L. Fayal; Flores; Pico.
- ✓ — (360). *Potentilla anserina*, L.
- ✓ — (361). *P. reptans*, L.
- ✓ 80 (358). *P. Tormentilla*, Schrank. Fayal; Flores; Pico.
Varietas reptans seu nemoralis (Flo. Az. 359) in montibus sparsim occurrit.
- ✓ 81 (362). *Agrimonia Eupatorium*, L. Fayal.
- ✓ — (363). *Poterium Sanguisorba*, L.
- ✓ 82 (—). *Alchemilla arvensis*, Lam. Fayal.
- ✓ 83 (—). *Epilobium parviflorum*, Schreb. Flores.
- ✓ 84 (166). *Callitriche verna*, L. Fayal; Flores; Pico.
- ✓ 85 (—). *Ceratophyllum demersum*, L. Flores.
- ✓ — (353). *Lythrum Graefferi*, Ten.
- ✓ 87 (354). *L. hyssopifolium*, L. Fayal; Flores; Pico; Corvo.
My No. 86 appears nothing more than a luxu-

riant form of this species; though it was labelled either "*L. Graefferi*" or "*L. junceum*."

- ✓ 88. (—). *Peplis Portula*, L. Fayal; Pico.
- ✓ 89. (328). *Portulaca oleracea*, L. Fayal; Flores; Pico.
- ✓ 90 (330). *Polycarpon tetraphyllum*, L. Fayal; Flores.
- ✓ — (329). *Illecebrum verticillatum*, L.
- ✓ 91 (303). *Umbilicus pendulinus*, DC. Fayal; Flores.
- ✓ 92 (302). *Tillæa muscosa*, L. Fayal; Flores; Pico.
- ✓ 93 (301). *Hedera Helix*, L. Fayal; Flores.
 Var. *Hibernica*, foliis amplioribus, anglice "Irish Ivy."
- ✓ 94 (—) ?*Melanoselinum decipiens*, Hoffm. Fayal.
 Of this I brought two leaves only, which were taken from a young specimen without flowers, in the Caldeira of Fayal. They closely resemble the foliage of the Madeira plant; but may belong to some other umbelliferous species.
- ✓ 95 (293). *Sanicula Azorica*, Guth. Fayal.
 "*S. ciliata*, Solander ms. in Herb. Banks."
 C. Lemann. *S. ciliaris*, Herb. Smith.
- ✓ 96 (—). *Crithmum maritimum*, L. Flores; Corvo.
- ✓ 97 (297). *Fœniculum vulgare*, Gaert. Fayal; Flores.
- ✓ 98 (300). *Torilis infesta*, Hoffm. Fayal. ("T. Helvetica.")
- ✓ 99 (299). "*Daucus polygamus*, Gouan." Fayal; Flores.
 My specimens are young and imperfect.
- ✓ 100 (—). *Umbellifera*. Pico.
 E speciminibus fructu carentibus, floribusque parvis et in desiccatione tarda mucidis, genus dubium. Herba glabra. Fibrillæ radicis attenuati paucae. Caulis ramis divaricatis dichotomus. Petioli alati. Foliola foliorum biternatorum ovata, serrata, ad basin sæpius inæqualia; radicalium biternato-pinnatorum ad basin cordata. Pedunculi foliis oppositi. Involucrum nullum. Involucellum polyphyllum. Calyx—? Petala apice inflexa. Fructus—? Hab. ad vias prope litus insulæ Pico.

- ✓ 101 (—). *Apium graveolens*, L. Flores; Pico.
- ✓ 102 (—). *Chærophyllum aromaticum*, L.? Flores.
Some doubt attaches to the specific name of this plant. The leaves are deeply inciso-serrate and curled; thus bearing some resemblance to those of *Mentha crispa* or the *Curled Parsley* of the gardens. The *Chærophyllum* was seen in one locality only, plentiful there, yet possibly introduced.
- ✓ 103 (—). *Petroselinum trifoliatum*, H. Wats. ms. Flores. Caule erecto striato, petiolis vaginantibus, foliis ternatis biternatisve, foliolis sæpius basi inæqualibus: inferiorum ovatis acutis serratis: superiorum lanceolatis subintegris, involucri foliolis lineari-lanceolatis integerrimis, involucelli lanceolatis. Herba annua seu biennis, glabra, tripedalis, dichotome ramosa. Pedunculi foliis oppositi vel terminales. Corolla parva alba. Hab. in rupibus prope urbem Santa-Cruz, in insula Flores; alibi non visa.
- ✓ — (294). *P. sativum*, Hoffm.
- ✓ — (295). *Helosciadium nodiflorum*, Koch. var. *ochreatum*, DC.
- ✓ — (296). *Pimpinella dichotoma*, L.
The habitat, "in apricis pr. litus insulæ Pico," suggests a probability of my No. 100 being intended under this name.
- ✓ — (298)? *Kudmannia Sicula*, DC.
- ✓ 104 (—). *Sambucus nigra*, L. Fayal; Flores. (Aliena.)
- ✓ 105 (239). *Viburnum Tinus*, L. Fayal; Flores; Corvo.
On the shrubs of this species, so frequent in English gardens, the young leaves only have the midrib beneath and the margins fringed with hairs, which are perhaps glandular. The older leaves are glabrous, with the exception of some pubescent tufts in the axillæ of the principal veins: as is the case also with the Azorean specimens; the foliage of the latter being more ob-

tuse and coriaceous than those of our garden shrubs. It is unnecessary for authors to make a variety, and much less a species, from such differences.

- ✓ 106 (237). “*Rubia splendens*, Hoffmanssegg.” Fayal ; Flores.

Foliis senis-octonis lineari-obovatis apiculatis supra glaberrimis : costa paginae inferioris marginibusque reflexis cum caulibus angulatis retrorsum aculeato-scabris, pedunculis axillaribus, corollae lobis acuminatis. A *Rubia tinctorum* videtur satis diversa.

- ✓ 107 (238). *Sherardia arvensis*, L. Fayal ; Flores.

- ✓ 108 (235). *Galium Aparine*, L. Fayal.

- ✓ 109 (234). *G. palustre*, L. Flores.

- ✓ 110 (236). *G. anglicum*, Huds. Fayal ; Flores ; Pico.

- ✓ — (233). *G. Mollugo*, L.

- ✓ 111 (—). *Fedia dentata*, Vahl. Pico.

- ✓ 112 (194). *Scabiosa nitens*, R. & S. Flores ; Corvo.

Herbacea, foliis lanceolato-oblongis serratis lucidis glabris in petiolum alatum (spurium) piloso-ciliatum attenuatis : superioribus lanceolatis laciniato-serratis, pedunculis longissimis, corollis quinquefidis radiantibus involucrium (haud semper) excedentibus. “Quoad fructum non satis nota.” DC. Prodr. My specimens are only just coming into flower ; but the above character so nearly unites the imperfect descriptions of *S. nitens* and *S. neglecta*, that I am disposed to think they will prove to be one species.

- ✓ — (195). *S. neglecta*, Hornem. (Forma praecedentis?)

- ✓ 113 (—). *Campanula Vidalii*, H. Wats. (Hook. Icon. 684.) Flores.

- ✓ 114 (232). *C. Erinus*, L. Fayal ; Flores.

- ✓ 115 (286). *Erica scoparia*, L.

- ✓ 115 (287). *E. Azorica*, Hochst. Fayal ; Flores ; Pico.

Seubert distinguishes the latter of these two by

its arborescent stem, shorter sepals, &c. I am not prepared to say whether those characters are sufficiently clear and constant to become a specific diagnosis. While collecting in the islands, I recognized only a single species. As to green or reddish flowers, they may be seen on different sides of the same bush.

✓ 116 (288). *Calluna vulgaris*, Salisb. Fayal; Flores; Pico.

✓ 117 (289). *Menziesia Daboeci*, DC. Fayal; Pico.

✓ — (290). *Vaccinium Maderense*, Link.

✓ 118 (292). *V. cylindraceum*, Sm. Fayal; Flores; Pico.

V. longiflorum, Wickstr. (Flora Azorica, No. 291), videtur esse varietas parviflora. Frutex azorica, interdum fere arborescens, omnino convenit cum *V. Maderense*, forma et magnitudine foliorum, bracteis foliaceis, et quoque calycis dentibus, qui nunc breviores et obtusi, nunc longiores et acuti, apparent. Differt præcipue racemis elongatis, et corollis sæpius multo longioribus, campanulato-cylindricis, sed non vere cylindricis. Magnitudo coloresque florum valde variant.

✓ 119 (241). *Olea excelsa*, Ait. Fayal; Flores. (Aliena?)

✓ — (—)? *Jasminum Azoricum*, L. (In Azoricis ignotum.)

✓ 120 (242). *Asclepias fruticosa*, L. Fayal. (Aliena).

✓ — (243). *Exacum filiforme*, Willd.

✓ 121 (244). *Erythræa Centaurium*, Pers. Fayal; Flores.

✓ 122 (245). *E. Massoni*, Sweet. Fayal; Flores; Pico.

Caule tetragono a basi perenne ramoso humifuso, ramis floriferis ascendentibus elongatis uni multifloris, foliis plus minusve ellipticis oblongisve: superioribus distantibus acutiusculis, corollæ tubo limbi lobos ellipticos obtusos et sub anthesi calycem subæquante. Corolla alba. “*Chironia maritima*, Ait. Hort. Kew, 2, 6—nec Willd.” Herb. Smith, spec. ex Azoricis. “*E. diffusa*, Woods.” Varietas minor seu montana. Ramis sterilibus humifusis, floriferis in pedunculos ascendentes

2 ad.

bracteatos uni-trifloros elongatis, foliis inferioribus spathulato-ellipticis, corollæ tubo limbum calycemque paulo superante. Hab. in montibus frequens; fortasse pro forma typica habenda.

Varietas *major* seu *maritima*. Ramis sterilibus subnullis, floriferis ascendentibus tri-multifloris, foliis subrotundis oblongisve crassiusculis, corollæ tubo limbum calycemque æquante. Hab. in rupibus maritimis insulæ Flores, atque ab oris versus montium radices sparsim ascendens.

Subvarietates occurrunt, ex. gr. caule (primi anni?) simplici erecto—foliis plus minus ovatis—calyce corollæ tubum superante—petalis bifidis, &c. It is almost impossible to frame a diagnosis for a species so very variable, and which might readily be split into half a dozen such book-species as those which have been carved out of the Linnean *Chironia Centaurium*.

✓ 123 (262). *Convolvulus arvensis*, L. Fayal. (Floribus albis.

✓ 124 (263). *C. sepium*, L. Flores.

✓ 125 (—). *C. Imperati*, Vahl. Fayal.

Perennis, glabra. Caulis repens, ramosus. Folia carnosâ, petiolata, cordato-oblonga, panduriformia, vel tri-quinquelobata, lobo terminale majore, obtusissima vel emarginata, apiculata. Pedunculi uni-biflori, in medio bracteati. Sepala acuta vel acuminata. Stylus simplex. Stigma capitatum bilobum. Corolla alba, magna. Fructus——? Hab. in litore arenoso, ad Porto Pimo, prope urbem Horta, in insula Fayal; atque arenarum mobilium spatia ampla caulibus repentibus dense occupans. The characters of *C. Imperati* fit my plant pretty well. Whether or no it is one of the varieties of *C. littoralis*, Linn., may be questioned.

✓ 126 (256). *Heliotropium Europæum*, L. Pico.

- ✓— (257). *Echium violaceum*, L.
- ✓— (258). *E. vulgare*, L.
- ✓— (259). *Myosotis stricta*, Link.
- ✓— (260). *M. versicolor*, Pers. Syn.
- ✓ 127 (261). *M. maritima*, Hochst. Pico.
 Caulis erectus. Pedicelli approximati. Calyx in lacinias lineari-oblongas fere ad basin divisus. Species annua, inter Europæas *M. arvensi* proxima, sed satis distincta. Speciebus paludum valde dissimilis; igiturque animadversio “proprius accedit ad *M. cæspitosam*, Schultz” iniqua comparatio est. In cæteris a cl. Seuberto descriptio sat bona.
- ✓ 128 (—). *M. Azorica*, H. Wats. In Bot. Mag. 1844 t. 4122.
 Flores; Corvo.
 Species pulcherrima, floribus numerosis indigo-ticis; ab Europæis distinctissima.
- ✓ 129 (248). *Mentha rotundifolia*, L. Fayal; Flores.
- ✓ 130 (247). *M. viridis*, L. Flores.
- ✓ 131 (—). *M. sativa*, L.? Flores.
- ✓ 132 (—). *M. aquatica*, L.? Fayal; Flores.
 I cannot apply names to some of these *Menthae* (131-2) with any confidence of accuracy. Among more attractive objects, the species of this genus were too much neglected.
- ✓ 133 (—). *M. Pulegium*, L. Insulis omnibus.
 My No. 134 is probably a subglabrous variety of No. 133, but the flowers are wanting.
- ✓ 135 (252). *Calamintha officinalis*, Moench. Fayal; Flores.
 Variat foliis minoribus serratis acutis cum pubescentia brevioribus, et foliis crenatis obtusis cauleque villosioribus (“*villosissima* Benth.” Flo. Azo. No. 252.)
- ✓ 136 (251). *Thymus micans*, Lowe. Fayal; Flores; Pico.
 Variat calyce subregulari, id est, labio utroque in dentes duos profunde diviso.
- ✓ 137 (—). *Clinopodium vulgare*, Sm. Flores. (Corolla alba.)

- ✓ 138 (—). *Melissa officinalis*, L. Flores. (Aliena?)
- ✓ — (250). *Origanum Creticum*, L.
- ✓ 139 (—). *O. virens*, Link. (teste cl. Lemann). Flores.
An species unica, sub numeris “ (251)” et “ 139” ?
Floresiana cum specie Maderense omnino con-
venit.
- ✓ 140 (254). *Stachys arvensis*, L. Fayal; Flores.
- ✓ 141 (253). *Prunella vulgaris*, L. Fayal; Flores; Pico.
- ✓ 142 (246). *Lavandula Stæchas*, L. Fayal. (Aliena.)
- ✓ 143 (—). *Rosmarinus officinalis*, L. Fayal. (Aliena.)
- ✓ — (270). *Lycopersicum esculentum*, Dun.
- ✓ 144 (269). *Solanum pseudocapsicum*, L. Fayal; Pico.
- ✓ 145 (268). *S. nigrum*, L. Fayal; Flores.
- ✓ 146 (—). *S. villosum*, Lam. Flores.
- ✓ 147 (267). *Physalis pubescens*, L. Fayal; Flores.
- ✓ 148 (266). *Hyoscyamus Canariensis*, Ker. Fayal; Pico.
- ✓ 149 (—). *Verbascum Thapsus*, L. Fayal. (Aliena?)
- ✓ 150 (275*) *Sibthorpia Europæa*, L. Fayal; Flores.
- ✓ — (281). *Euphrasia officinalis*, L.
- ✓ 151 (280?). *E. Azorica*, H. Wats. ms. Flores; Corvo.
Herbacea, annua? Caulis teres. Rami sulcati
obtuse tetragoni. Folia triangulari-ovata, acuta;
pagina superior rugulosa vel scabrida; pagina in-
ferior rugosa cum maculis verrucæformibus dense
piliferis. Corolla alba (non purpurascens) macula
duplici ampla intus variegata. In cæteris cum
descriptione *E. grandifloræ*, Hochst. (Flo. Azo.
No. 280) optime convenit. Hab. in montibus
insularum Flores et Corvo. The *E. grandiflora*
having been found on a different island, and some
characters of the diagnosis (Flo. Azo. l. c.) being
inapplicable to my specimens, it has appeared
better at present to retain the ms. name under
which my specimens were distributed. I sup-
pose, however, that the species will prove iden-
tical, and that the character, in the work quoted,
must be modified accordingly.
- ✓ 152 (—). *Bartsia Trixago*, L. Pico.

- ✓ 153 (—). *Scrophularia aquatica*, L. Flores.
- ✓ — (271). *S. Scorodonia*, L.
- ✓ 155 (275). *Antirrhinum Orontium*, L. Flores. (In arvis.)
No. 154 nost. spec. est ejusdem varietas subglabra, glaucescens, floribus albidis purpureo-striatis. Hab. in muris rupibusque siccis insulæ Fayal.
- ✓ 156 (272?). *Linaria dealbata*, Link. Fayal.
Folia ovata; inferiora basi utrinque tridentata, superiora sagittata, suprema integerrima. An "*Linaria Sieberi*, Reichb." (Flo. Azo. No. 272)?
- ✓ 156 (274). *L. spuria*, L. Fayal. (Desunt flores.)
- ✓ — (273). *L. cirrhosa*, Willd.
- ✓ 157 (277). *Veronica officinalis*, L. Fayal; Pico.
- ✓ 158 (279). *V. Dabneyi*, Hochst. Fayal; Corvo.
- ✓ 159 (—). *V. serpyllifolia*, L. Fayal; Flores.
- ✓ 160 (278). *V. Anagallis*, L. Fayal; Flores.
- ✓ 161 (276). *V. arvensis*, L. Fayal; Flores.
- ✓ 162 (—). *Acanthus mollis*, L. Fayal; Flores. (Aliena)?
- ✓ 163 (255). *Verbena officinalis*, L. Fayal; Flores.
- ✓ 164 (283). *Lysimachia Azorica*, Hornem. Fayal; Flores.
Lætevirens. Caules ascendentes. Folia ovata vel elliptica, obtusiuscula; paginæ superioris venæ prominulæ. Calycis laciniæ lanceolatae. Semina inter angulos plana. In cæteris cum diagnosi *Lysimachiae nemorum* (DC. Prodr. 8.66) bene convenit. An-ne species propria, in iconibus male depicta, in libris haud melius descripta? *Lysimachia nemorum* vere simillima; tametsi distinguenda caule prostrato radicante sub sole purpurascente, foliis late ovatis acutis, in pagina superiore venis impressis, calycis laciniis subulatis marginibus membranaceis, seminibus inter angulos convexis.
- ✓ 165 (284). *Anagallis arvensis*, L. Fayal; Flores.
- ✓ 166 (284). *A. cærulea*, All. Fayal.
- ✓ 167 (—). *Centunculus minimus*, L. Flores; Corvo.

- ✓ 168 (—). *Samolus Valerandi*, L. Flores.
- ✓ 169 (285). *Myrsine retusa*, Ait. Ins. omnibus.
- ✓ 170 (218). *Cichorium Intybus*, L. Fayal; Flores.
- ✓ 171 (—). *Lactuca Scariola*, L. Fayal; Flores.
- ✓ 172 (—). *Sonchus oleraceus*, L. Fayal.
- ✓ 173 (230). *S. asper*, Hoffm. Fayal; Pico.
- ✓ 174 (229). *Helminthia echioides*, Gaert. Flores.
- ✓ 175 (225). *Urospermum picroides*, Desf. Fayal.
- ✓ 176 (—). *Leontodon Taraxacum*, L. Fayal. (Absunt flores.)
- ✓ 177 (224). *Hypochæris glabra*, L. Fayal; Flores.
- ✓ 178 (223). *Thrinchia nudicaulis*, Lowe. Fayal.

Disci achenia muricata, in rostrum læve breviter sed tamen distincte attenuata; radii læviuscula, æqualiter sed tamen obscure attenuata. In cæteris cum *T. hirta*, DC. (agris anglicis) convenit planta a me lecta in Fayal; igiturque forma est intermedia inter *T. hirtam* et speciem in *Flora Azorica*, sub nomine *T. nudicaulis*, Lowei, enumeratam.

- ✓ 181 (231). “*Crepis polymorpha*, Wallr.” Fayal; Flores.
My specimens being young, I trust to the *Flora Azorica* for the name; otherwise they might have been considered *Crepis tectorum*, L.
- ✓ 179 (221). *Tolpis fruticosa*, Schrank. Fayal; Flores.
In Azoricis, folia sunt lineari-lanceolata, sinuato-dentata, vel breviter et remote dentata, vel subintegra. In hortis anglicis, e seminibus azoricis orta, gerit folia inferiora obovato-oblonga, dentata; superiora lineari-oblonga, integerrima.
- ✓ 180 (—). *T. umbellata*, Bert. Fayal; Flores.
Disci achenia setis 3-5 aristata. Involucri squamæ exteriores, in anthodiis primariis, interiores superant; in ramis, subæquales sunt; in ramulis, his illæ breviores. *Tolpis quadriaristata*, Herb. Smith. sine auct. *Tolpis crinita*, Lowe, a spec. cl

Lemann comm. An-ne duæ sequentes (219) et (220) species unica cum præsentate?

- ✓ — (219). *T. barbata*, Gaert.
- ✓ — (220). *T. crinita*, Lowe.
- ✓ 182 (—). *T. macrorhiza*. DC. Fayal; Flores.
 Caulis ascendens, flexuosus, angulatus. Folia inferiora probabiliter (in spec. nost. marcida et deformata) petiolata, suprema acuta. In cæteris cum diagnosi (DC. Prodr. 7. 86) sat bene convenit. Specimen Maderense (a cl. Lemann comm.) differt caule graciliore, recto, et foliis angustioribus, acutis, basi attenuatis.
- ✓ 182 (222). *T. nobilis*, Hochst. Flores; Pico.
 Cum diagnosi et icone cl. Seuberti, in *Flora Azorica*, optime convenit; nisi quod folia superiora cordata et amplexi caulia sunt, cum dentibus brevioribus et subintegris. “*Crepis dentax*, Sol. ms. in Herb. Banks.—collected in San Miguel, by Masson.” Dr. C. Lemann. My very few specimens appear so like connecting links between this species and the *T. macrorhiza* from Madeira, that they raise a doubt whether these two may not be forms of a single species; or, it may be, that a third species should stand between them, represented by the specimens above assigned to *T. macrorhiza*, DC.
- ✓ 183 (227). *Microderis rigens*, DC. Fayal; Flores.
 Scapus plus minusve setoso-hispidus, sæpius aphyllus, raro (ut in icone Seuberti) monophyllus. *M. umbellata*, Hochst. in Flo. Azo. No. 227.
- ✓ 183 (228). *M. filii*, Hochst. Fayal.
 I have only a single plant of this species, with the dry scape which had remained after the seed had been scattered from it. In this state it was not recognized as a distinct species, until after my return to England.

- ✓ 184 (214). *Centaurea Melitensis*, L. Fayal.
 ✓ 185 (215). *Galactites tomentosa*, Mœench. Fayal; Pico.
 ✓ 186 (216). *Carduus pycnocephalus*, L. Pico.
 ✓ 187 (217). *C. lanceolatus*, L. Pico.
 ✓ 188 (199). *Bidens leucantha*, L. Fayal. (Aliena?)
 ✓ — (208). *Gnaphalium Pennsylvanicum*, Willd.
 ✓ 189 (207). *G. luteo-album*, L. Fayal; Flores; Pico.
 ✓ 190 (209). *Filago Germanica*, L. Fayal.
 ✓ 191 (210). *F. Gallica*, L. Fayal.
 ✓ 192 (197). *Solidago Azorica*, Hochst. Ins. omnibus.
 S. floribunda, Solander, in Herb. Banks. fide cl.
 Lemann.
 ✓ 193 (—). *Erigeron Canadensis*, L. Fayal; Flores; Corvo.
 ✓ 194 (198). *Conyza ambigua*, DC. Fayal; Flores.
 ✓ 195 (201). *Anthemis aurea*, DC. Fayal; Flores.
 ✓ 196 (200). *A. Cotula*, L. Fayal; Flores.
 ✓ N^o. 0 (202). *Santolina Chamæcyparissus*, L. (Certe aliena.)
 ✓ 197 (203). *Chrysanthemum Myconis*, L. Fayal.
 ✓ 198 (204). *C. segetum*, L. Fayal. (Et quoque No. 199.)
 ✓ N^o. 0 (205). *C. coronarium*, L. Fayal. (Certe aliena.)
 ✓ — (206). *C. pinnatifidum*, L.
 ✓ 200 (—). *Senecio Maderensis*, DC. Fayal. (Desunt
 flores.)
 ✓ — (212). *S. malvæfolius*, DC.
 ✓ — (211). *S. pseudo-elegans*, Less. (“Planta capensis”)
 ✓ 201 (—). *S. vulgaris*, L. Fayal.
 ✓ 202 (196). *Seubertia Azorica*, H. Wats. ms. Ins. om-
 nibus.

Receptaculum planiusculum. Achenia in ver-
 rucas squamæformes insidentia. Involucrum sub
 fructu reflexum. Perennis. Folia alterna. Pe-
 dunculi terminales aut (in plantis junioribus)
 scapiformes. In cæteris cum caractere generis
Bellis (DC. Prodr. 5. 304) et diagnosi speciei
B. Azorica (Flo. Azo. No. 196) omnino convenit.
 I have ventured to change the generic name of

this plant, into one which will commemorate the learned author to whom science is indebted for the first *Flora Azorica*; and with which the specific name will aptly correspond. It will be for the authorities in Botany to decide whether a new genus shall be founded on small differences (as usually done among the *Compositæ*) or whether the generic character of *Bellis* shall be so far modified as to include the *Seubertia*.

- ✓ 203 (—). *Calendula arvensis*, L. Fayal.
- ✓ — (213). *C. officinalis*, L. Eadem species ac 203?
- ✓ 204 (—). *Xanthium strumarium*, L. Flores.
Varietas, fructu subgloboso, rostris brevioribus.
- ✓ 205 (—). *Mirabilis divaricata*, Lowe. Flores. (Aliena?)
- ✓ 206 (189). *Plantago major*, L. Fayal; Flores.
- ✓ — (190). *P. media*, L.
- ✓ 207 (191). *P. lanceolata*, L. Fayal; Flores.
Ad hanc quoque adducenda *P. Azorica*, Hochst. (Flo. Azo. No. 192.) In horto nostro culta, e seminibus azoricis, secundo anno, a *P. lanceolato* vix, et ne vix quidem, distinguenda.
- ✓ — (193). *P. Lagopus*, L.
- ✓ 208 (188). *P. Coronopus*, L. Fayal; Flores.
- ✓ 209 (—). *Littorella lacustris*, L. Corvo.
- ✓ 210 (—). *Amaranthus Blitum*, L. Flores; Corvo.
One specimen, from Fayal, may belong to a second species,—perhaps *A. strictus*.
- ✓ 211 (178). *Chenopodium ambrosioides*, L. Fayal; Flores.
- ✓ — (179). *C. rubrum*, L.
- ✓ 212 (180). *C. murale*, L. Fayal; Corvo; Pico.
- ✓ 213 (181). *Salsola Kali*, L. Fayal.
Anne potius *Salsola Tragus*, L.?
- ✓ 214 (—). *Atriplex patula*, L. Flores; Corvo.
- ✓ 215 (—). *Beta maritima*, L. Fayal.
- ✓ 216 (—). *Rumex* —? Caldeira in Fayal.
Seeing this plant with unexpanded flowers in June,

I then took only two small lateral branches, under the expectation of returning to the locality at a later season; though in this I was disappointed. It is a very large species, probably exceeding *R. Hydrolapathum*, Huds.

- ✓ 217 (—). *R. acutus*, Sm. Fayal.
A *Rumice sanguineo*, L. vix distinguenda.
- ✓ 218 (—). *R. crispus*, L. Corvo.
- ✓ 219 (—). *R. pulcher*, L. Fayal.
- ✓ — (185). *R. strictus*, Link. An species unica, 219 (185)?
- ✓ — (184). *R. bucephalophorus*, L.
- ✓ 220 (—). *R. Acetosella*, L.? Fayal; Flores.
Species incerta. In specim. nostro desunt folia inferiora; superiora lanceolata, ad basin utrinque unidentata, non aliter hastata sunt. Flores in statu alabastri tantum possideo.
- ✓ 221 (—). *Polygonum aviculare*, L. Fayal; Flores; Pico.
- ✓ 222 (182). *P. maritimum*, L. Fayal.
Raised in my garden, from the seeds brought home, the plants are altogether so intermediate between *P. maritimum* and *P. Raii* (Bab. in Linn. Trans. Vol. 18, p. 458 and Eng. Bot. Supp. 2805) that, if their descent were unknown, it would be highly difficult to refer them to either with certainty. This seems almost to establish the specific identity of *P. maritimum* and *P. Raii*, different as these plants undoubtedly appear in the absence of the intermediate forms.
- ✓ — (183). *P. Persicaria*, L.
- ✓ 223 (—). *P. ———?* Flores; Corvo.
Caulis erectus, lævis. Folia lanceolata, hispida præcipue ad margines. Ochreæ foliorum strigosæ, ciliatæ; florum læves, ciliatæ. Pedunculi læves, terminales vel (raro?) laterales, spicas filiformes subracemosas erectas 2-3 gerentes. Fructus lævis angulis obtusis nitidis. My few specimens,

glued down, will not enable me to make a proper description of this, which I cannot refer satisfactorily to any described species.

- ✓ 224 (177). *Phytolacca decandra*, L. Fayal; Flores.
 ✓ 225 (—). *Persea Indica*, Spr. Fayal; Flores. (Aliena?)
 ✓ 226 (186). *P. Azorica*, Seub. Fayal; Flores; Pico.
 An species vera? Anne Laurus Barbusana,
 Lowei?
 ✓ 227 (187). *Daphne Laureola*, L. Pico. (Ramis divaricatis.)
 ✓ 228 (—). *Corema alba*, Don. Pico. (In colle juxta litus.)
 ✓ 229 (—). *Buxus sempervirens*, L. Fayal. (Aliena.)
 ✓ 230 (172). *Euphorbia Stygiana*, H. Wats. ms. Fayal;
 Flores

Fruticosa, inermis, subcarnosa, ramis erectis superne foliosis, foliis sessilibus confertis crassis subcoriaceis lineari-oblongis mucronatis sparse-pilosis purpureo-glauculentibus, pedunculis corymboso-umbellatis (axillaribus solitariis longioribus et terminalibus numerosis umbellatis) subquadriradiatis: radiis furcatis dicephalis, bracteis involucris florum masculorum squamis pedunculisque junioribus villosis, fructu verrucoso. Hab. in fissuris rupium, alt. 1500-2500 ped. angl. supra mare. Ad hanc proxima certe *Euphorbia mellifera*, Ait. (Flo. Azo. No. 172) sed distinguenda (an semper?) foliis lævibus, lanceolatis, tenuiter uncinato-apiculatis, basi fere in petiolum attenuatis, in herbario conspicue venosis; et quoque inflorescentia minus composita atque sublæve, id est, pedunculis corymbi sublævibus tri-quadriradiatis, radiis simplicibus monocephalis, bracteis ciliatis tantum, et involucris extrinsecus lævibus. Having seen very few specimens of *E. mellifera*, I am not prepared to say whether the characters above given will always distinguish that species from *E. stygiana*. Among the many preoccupied names in this genus, all those most

applicable to the present species are already applied otherwise. I have therefore taken up the name of the steam vessel (Styx), from which I landed to botanize, and the name is really not ill applied to the dark foliage and sombre appearance of this shrub, with its skeleton-like branches, bare of leaves, except near their summits.

- ✓ 231 (171). *E. Azorica*, Hochst. Fayal; Flores; Pico.
Species perennis, etiam suffruticosa, ut opinor; sed tamen hoc inquirendum. Proxima *E. Portlandicæ*.
- ✓ 232 (—). *E. exigua*, L. Fayal.
- ✓ 233 (—). *E. Peplus*, L. Flores.
- ✓ 234 (169). *E. Peplis*, L. Fayal.
- ✓ — (170). *E. Lathyris*, L.
- ✓ — (173). *Ricinus communis*, L.
- ✓ 235 (—). *Mercurialis annua*, L. Fayal.
- ✓ 236 (—). *Parietaria Lusitanica*, L. Pico.
- ✓ 237 (176). *P. officinalis*, L. Fayal; Flores.
- ✓ 238 (174). *Urtica Azorica*, Hochst. Fayal.
Probabliter varietas *U. membranaceæ*, Poir. Spicæ fœmineæ subglobosæ vel cylindricæ, vel etiam filiformes.
- ✓ — (175). *U. Loweii*, Seub.
- ✓ 239 (—). *Populus nigra*, L? Fayal; Flores. (Aliena?)
- ✓ 240 (—). *Salix fragilis*, L. Fayal. (Aliena?)
- ✓ 241 (167). *Myrica Faya*, Ait. Fayal; Flores; Pico.
- ✓ 242 (163). *Juniperus Oxycedrus*, L.? Fayal; Flores; Pico.
Seubert places this as a variety (*brevifolia*, Hochst.) of the species to which it is here doubtfully assigned. I have not seen ripe fruit, but the young fruit, equally as the leaves, differ considerably from those of all the examples of *J. Oxycedrus* which have come under my observation, excepting one from Madeira.
- ✓ — (164). *Pinus Pineæ*, L.
- ✓ — (165). *Taxus baccata*, L.

Like the orange and lemon, in the Western Azores, these two trees grow where they are planted; and that is all their claim to nativity.

√ 243 (157). *Serapias cordigera*, L. Fayal.

I saw it so low as 300 feet in Fayal, no where above 2000. For this, as well as other species, the range of altitude stated in the *Flora Azorica* must not be very implicitly relied upon.

244 (155). *Habenaria micrantha*, Hochst. Fayal; Flores.

Calcar fusiforme, sepalis labelloque lineari integro paulo longius, ovario bracteis breviori bis terve brevius. Flores numerosi (50) dense spicati, aut, in specimine parvo, pauci (12) laxe spicati.

√ 244 (156). *H. longibracteata*, Hochst. Flores.

Calcar filiforme incurvum, sepalis labelloque lineari integro duplo longius, ovario bracteas subæquante triente brevius, Flores numerosi (30). These two species of *Habenaria* (or *Platanthera*) are probably variable. I found few plants, and have reserved only three of them for my herbarium. They are here partly described, because not quite corresponding with the diagnoses and figures in the *Flora Azorica*. Shortly before leaving the islands, it was my misfortune to lose a book in which I had sketched the flowers of these and other novelties from the living plants. Now, I have only the specimens in my herbarium to look to; the duplicates having been distributed.

√ 245 (—). *Iris* —? Prope Largens, in Flores. (Indigena?)

√ 246 (—). *Gladiolus* —? Prope Flamings, in Fayal. (Aliena?)

√ 247 (0). *Amaryllis Belladonna*, L. Fayal. (Aliena.)

— (152*). *Scilla maritima*, L.

- ✓ 248 (—). *Narcissus* —? In monte Carneiro, in Fayal.
(Aliena?)
NB.—The bulbs and withered leaves of the *Amaryllis* were abundant about Horta, in the month of June, and some flowers appeared early in September. The *Iris*, *Gladiolus* and *Narcissus* were seen only in single localities; the flowers gone, and leaves withered.
- ✓ 249 (153). *Smilax divaricata*, Sol. ms. in Herb. Banks.
Pico.
This plant corresponds very ill with specimens of *S. mauritanica* in the herbarium of Sir W. J. Hooker, which is considered synonymous with *S. tetragona*, the name under which Seubert places the plant from Pico. In my specimens, the stem is terete and striated, though somewhat angular where the flowers grow.
- ✓ — (154). *Ruscus androgynus*, L.
- ✓ 250 (161). *Arum Italicum*, Mill. Fayal.
- ✓ N^o.0 (162). *Colocasia antiquorum*, Schott. (Culta.)
Of these two plants I saw the leaves only: those of the *Arum* almost withered away. I must therefore trust to the *Flora Azorica* for their names. I had supposed the *Arum* to be our *maculatum*, and alluded to the *Colocasia* under name of *Caladium*, called by the natives “Coco” —typographically improved into “Cocoa,” which is a difference indeed.
- ✓ — (160). *Lemna minor*, L.
- ✓ 251 (158). *Potamogeton natans*, L. Fayal; Flores; Pico.
- ✓ 252 (—). *P. heterophyllus*, L.? Flores; Corvo.
- ✓ 253 (—). *P. pusillus*, L. Flores.
- ✓ — (159). *P. pectinatus*, L.
- ✓ 254 (147). *Luzula purpurea*, H. Wats. ms. Ins. omnibus.
I adopt the original specific name for this species. Dr. C. Lemann informs me that a specimen is

in the Banksian herbarium, collected in San Miguel, by Masson; though it is misnamed *campestris*. It now appears, by a reference in the Flora Azorica, that Masson's plant had been published, though not described, under the name of "*Juncus purpureus*, Masson" (Buch in Abhandl. der Berlin Akad. 1816—17. p. 362.) Guthnick (1839?) circulated his specimens labelled *Luzula elegans*, Lowe; and I presume that the species was published under the same name in Hochstetter's list (Wiegemann's Archiv. 1843) which I have not been able to obtain. In the London Journal of Botany (1843) I stated that *L. elegans*, of Lowe, was quite a different species; and then (unaware of the earlier name *purpureus*) suggested that of *azorica*. Lastly (1844) Mr. Seubert, in the full knowledge of these earlier names, describes the plant under the inconveniently long name of *purpureo-splendens*. Now, as only one species had been brought from the Azores, and I expressly referred to the specimen of Guthnick, the travelling companion of Hochstetter, whose misapplication of Lowe's name I sought to correct, Seubert knew perfectly well that my name *azorica* was applied to the same species which he has chosen to re-name. Under these circumstances, the original specific name of Masson or Buck is resumed, with the necessary change from *Juncus* to *Luzula*.

- ✓ 255 (150). *Juncus acutus*, L. Fayal; Flores.
- ✓ — (149). *J. maritimus*, L.
- ✓ 256 (—). *J. effusus*, L. Fayal; Flores.
- ✓ 257 (151). *J. capitatus*, Wiegelt. Fayal; Flores; Corvo.
- ✓ 258 (152). *J. uiginosus*, Roth. Flores.
- ✓ 259 (148). *J. bufonius*, L. Fayal; Flores.
- ✓ 260 (147*). *J. tenuis*, Willd. Fayal.

Sub nomine *J. lucidus*, Hochst. in Flora Azorica;

sed species Azorica omnino convenit cum specimenibus Americanis a cel. Hooker comm. sub nomine *J. tenuis*.

- ✓ 261 (—). *Cladium Mariscus*, Br. Flores.
- ✓ 262 (146). *Cyperus longus*, L. Fayal; Flores.
- ✓ 263 (145). *C. esculentus*, L. Ins. omnibus. (Aliena?)
- ✓ 264 (—). *C. vegetus*, Willd. Flores.
- Only two tufts of this were found, on the sea cliffs by Santa Cruz. It appears identical with plants in Kew Gardens and in the herbarium of Sir W. J. Hooker, which bear this name. Two or three minor points in Kunth's character and description are inapplicable, namely, the long leaves, shining seeds, and ferruginous dots on the glumes or scales.
- ✓ — (142). *Scirpus maritimus*, L.
- ✓ 265 (—). *S. setaceus*, L. Fayal.
- ✓ 266 (140). *S. Savii*, Sebast. et Maur. Fayal; Flores; Pico.
- ✓ 267 (141). *S. fluitans*, L. Pico.
- ✓ 268 (143). *S. palustris*, L. Flores.
- ✓ 269 (144). *S. multicaulis*, Sm. Fayal; Pico.
- ✓ 270 (129). *Carex sagittifera*, Lowe. Fayal; Flores; Pico. Cæspitosa. Utriculi maturi reflexi. Achenium oblongum. *C. Guthnickiana*, Gay. (Flo. Azo. No. 129.)
- ✓ 271 (—). *C. vulpina*, L. Flores.
- ✓ 272 (131). *C. stellulata*, L. Flores; Pico.
- ✓ 273 (130). *C. divulsa*, Good. Fayal.
- ✓ 274 (133). *C. Azorica*, Gay. Pico.
- ✓ 275 (132). *C. flava*, L. Fayal; Flores; Pico.
- ✓ 276 (134). *C. lævicaulis*, Kunze. Flores.
- ✓ 277 (137). *C. Floresiana*, Hochst. Flores.
- ✓ 277 (138). *C. Vulcani*. Hochst. Fayal; Flores?

It is probable that *Carex Watsoni*, Boott ms. (alluded to in *Flora Azorica*) includes both these species of Hochstetter. I had only some six or eight specimens altogether, and Dr. Boott saw but half of them. Of the two reserved for

my herbarium, one, in a young state, from Fayal, seems clearly *C. Vulcani*. The other is from Flores, and more advanced; and it corresponds better with the description and figure of *C. floresiana*, though different in some particulars. It is two feet high; with two barren, and only two fertile spikes; the uppermost barren spike rather exceeding the bracts; the scales or glumes of the female spikes taper more gradually to their apex; the utriculi also taper more both at base and apex, and are speckled with dark brown dots. My two specimens appear really distinct species; but since priority in publication will keep up the names of Hochstetter, the only question of moment, is, whether my Flores specimen, above mentioned, is the *C. floresiana* or a third species. If the former, the description in *Flora Azorica* must be modified where at variance with the characters above-mentioned.

- ✓ — (135). *C. rigidifolia*, Hochst.
- ✓ 278 (136). *C. Hochstetteriana*, Gay. Fayal.
- ✓ 279 (139). *C. pendula*, Huds. Fayal; Flores.
Species unica sub nominibus *C. pendula*, Huds.
C. maxima, Scop. *C. myosuroides*, Lowe.
- ✓ 280 (109). Eleusine *Indica*, L. Fayal.
- ✓ 281 (108). Cynodon *Dactylon*, Pers. Fayal.
- ✓ 282 (99). *Digitaria sanguinalis*, Scop. Fayal; Flores;
Pico.
- ✓ 283 (100). *Setaria glauca*, Beauv. Fayal; Flores.
- ✓ 284? (—). *S. verticillata*, Beauv. Fayal?

A single example of this was found among the specimens collected in Fayal. I have no recollection of seeing it in the islands, and suppose that the one specimen may have been previously in the drying paper taken out from England: if not, the species was overlooked among the *S. glauca*.

- ✓ 285 (—). *Panicum Crus-galli*, L. Fayal; Flores.
- ✓ 286 (98). *Anthoxanthum odoratum*, L. Fayal; Flores.
- ✓ 287 (111). *Lagurus ovatus*, L. Fayal.
- ✓ 288 (103). *Polypogon maritimus*, Willd.
- ✓ 288 (104). *P. Monspeliensis*, Desf. Fayal; Flores; Pico.
My specimens were mingled and distributed indiscriminately under the name of *P. monspeliensis*. As the arista of the palea was long, short, or absent on different specimens, some of them should probably have been labelled *P. maritimus*.
- ✓ 289 (102). *Gastridium australe*, Beauv. Fayal; Flores; Pico.
- ✓ 290 (114). *Gaudinia geminiflora*, Gay. Fayal.
A *G. fragili*, nisi spiculis hirtis, vix differt.
- ✓ 291 (119*). *Cynosurus echinatus*, L. Fayal; Pico.
- ✓ 292 (119). *Koeleria Phleoides*, Pers. Fayal.
- ✓ 293 (106). *Deyeuxia Azorica*, Hochst. Corvo.
- ✓ — (105). *D. cæspitosa*, Hochst.
- ✓ 294 (—). *Agrostis alba*, L. Fayal; Flores; Corvo.
- ✓ 295 (101). “*A. verticillata*, Vill.” Fayal; Flores.
- 296 (—). *Agrostis*? Summit of Pico.
- ✓ 298 (—). *A. pallida*, DC.? Fayal; Flores.
My weak eyes forbid any sufficient examination of the grasses. Possibly No. 296 or No. 298 may be the *Deyeuxia cæspitosa*, Hochst.
- ✓ 297 (110). *Aira caryophyllea*, L. Fayal; Flores; Pico.
- ✓ 299 (—). *Deschampsia argentea*, Lowe. Flores.
- ✓ 300 (—). *Holcus lanatus*, L. Fayal; Flores.
- ✓ 301 (96). *H. rigidus*, Hochst. Fayal; Flores.
Though my specimens are two feet high, I presume them to be the same species as the small plant figured in the *Flora Azorica*. Clearly distinct from *H. mollis*, to which I had first improperly referred them.
- ✓ 302 (—). *Avena elatior*, L. Fayal; Flores.
- ✓ 303 (112). *A. hirsuta*, Roth. Fayal.

- ✓ — (113). *A. brevis*, Roth.
- ✓ 304 (107). *Arundo Donax*, L. Ins. omnibus. (Aliena?)
- ✓ 305 (117). *Briza maxima*, L. Fayal; Flores; Pico.
- ✓ 306 (118). *B. minor*, L. Fayal.
- ✓ 307 (124). *Bromus Madritensis*, L. Fayal.
- ✓ — (123). *B. rubens*, L.
- ✓ 308 (—). *B. mollis*, L. Fayal; Pico.
Varietas, panicula conferta, spiculis hirsutioribus; quæ ad *B. confertum*, Bieb. proxime accedit, sed tamen distinguenda aristis rectis et glumis minus nervosis.
- ✓ 309 (127). *Brachypodium distachyum*, Beauv. Pico.
- ✓ 310 (—). *B. sylvaticum*, Beauv. Fayal.
Varietas, foliis vaginisque subglabris.
- ✓ — (126). *Triticum repens*, L.
- ✓ 311 (122). *Festuca bromoides*, L. Fayal.
- ✓ 312 (121). *F. petræa*, Guth. Fayal.
- ✓ 313 (120). *F. jubata*, Lowe. Fayal; Corvo?
Specimina nostra immatura sunt; sed autem ad hanc speciem pertinere videntur: et quoque *F. glauca*, var. *longebracteata*, Hochst. in Flora Azorica, No. 120.
- ✓ 314 (—). *Poa trivialis*, L. Fayal; Pico.
- ✓ 315 (—). *P. annua*, L. Fayal.
- ✓ 316 (—). *P. Eragrostis*, L. Pico.
- ✓ 317 (116). *P. rigida*, L. Fayal.
- ✓ — (115). *P. loliacea*, Huds.
- ✓ 318 (125). *Lolium multiflorum*, Lam. Fayal; Flores.
Varietas aristata *Lolii perennis*, L.
- ✓ 319 (128). *Hordeum murinum*, L. Fayal.
- ✓ 320 (71). *Polypodium vulgare*, L. Fayal; Flores.
Varietas, fronde ampliori, subtriangulari, serrata.
- ✓ 321 (87). *Cystopteris fragilis*, Bernh. Fayal; Flores; Pico.
- ✓ 322 (70). *Grammitis leptophylla*, Sw. Fayal.
- ✓ 323 (84). *Scolopendrium vulgare*, Sm. Fayal; Flores.
- ✓ 324 (76). *Asplenium palmatum*, Sw. Fayal; Flores; Pico.

- ✓ 325 (80). *A. monanthemum*, Sm. Fayal; Flores
 ✓ 326 (78). *A. anceps*, Sol. Fayal; Flores.
 Ad hoc proxime accedit *A. Trichomanes*, L. in
 nonnullis exemplis.
 ✓ 327 (79). *A. marinum*, L. Fayal; Flores.
 ✓ 328 (77). *A. Adiantum-nigrum*, L. Fayal; Flores.
 ✓ 329 (—). *A. lanceolatum*, Huds. Fayal; Flores.
 ✓ 330 (—). *Athyrium Filix-fœmina*, Sw. Fayal; Flores.
 ✓ 332 (81). *Allantodea umbrosa*, Br. Flores; Pico.
 ✓ — (82). *A. axillaris*, Kaulf.
 ✓ 331 (85). *Nephrodium fœnesecii*, Lowe. Fayal; Flores;
 Pico.
 ✓ 333 (—). *N. molle*, Sw. Fayal; Flores.
 ✓ 334 (86). *Aspidium angulare*, Sm. Fayal; Flores.
 ✓ 335 (69). *Acrostichum squamosum*, Sw. Fayal; Flores;
 Pico.
 ✓ 336 (75). *Blechnum boreale*, Sw. Fayal; Flores; Pico.
 ✓ 337 (74). *Pteris arguta*, Vahl. Fayal; Flores; Pico.
 ✓ 338 (73). *P. aquilina*, L. Fayal; Flores; Pico.
 ✓ 339 (83). *Woodwardia radicans*, Sw. Fayal; Flores; Pico.
 ✓ 340 (88). *Dicksonia Culcita*, Herit. Fayal; Pico.
 ✓ — (72). *Adiantum Capillus-Veneris*, L.
 ✓ 341 (90). *Trichomanes speciosum*, Willd. Fayal; Flores.
 ✓ 342 (89). *Hymenophyllum tunbrigense*, Sm. Fayal; Flores;
 Pico.
 ✓ 343 (—). *H. Wilsoni*, Hook. Flores; Corvo.
 ✓ 344 (91). *Osmunda regalis*, L. Fayal; Flores.
 ✓ 345 (92). *Ophioglossum vulgatum*, L. Flores.
 Exempla Floresiana cum Britannicis sat bene con-
 veniunt, atque ad speciem alteram caute refe-
 renda. In paucis exemplis rhizoma frondes duas
 eodem tempore gerit; sed tamen frequentius
 fronde unica, statura, et spicæ pedunculi longi-
 tudine planta Azorica cum *O. vulgato* convenit.
 ✓ 346 (—). *Lycopodium Selago*, L. Pico; Fayal?
 ✓ 347 (93). *L. suberectum*, Lowe. Fayal; Flores; Pico.
 ✓ 348 (95). *L. denticulatum*, Willd. Fayal; Flores; Pico.

- ✓ — (94). *L. cernuum*, L. (San Miguel. J. C. Hunt, Esq. sp.)
- ✓ 349 (—). *Isoetes lacustris*, L. Corvo.
- ✓ 350 (—). *Equisetum fluviatile*, Sm.—nec Linn. Fayal; Flores.

NB.—There are two other phænogamic plants, of which I possess leaves only, and cannot certainly indicate even their orders. One is probably an *Umbelliferous* plant, from the neighbourhood of Horta, in Fayal: the other may be a large-leaved *Composita*, from the Caldeira of Fayal. The total number of species, in both collections together, amounts to four hundred Flowering plants and thirty-four Ferns, etc. But among the Flowering plants enumerated, there are at least twenty introduced species, and many others which probably are in the same condition. Some small further abatement may be made, for species counted twice over, under different names (see *Tolpis umbellata*, *Hypericum decipiens*, etc.), although I have endeavoured to reduce the number of these as far as possible. And when we observe how many in the list are the common weeds of South Europe, which emigrate with agriculture, it may well be doubted whether the true Azoric Flora, as far as yet ascertained, reaches to three hundred species of Flowering plants. There is a strong presumption that several additional species would yet be discovered by botanists who extended their researches over other parts of the islands and saw them at a different season. About seventy of the species collected by Messrs. Hochstetter and Guthnick are wanting in my own collection; and this latter, in turn, has about one hundred and ten species which apparently were not found by those two travellers.

Of the *Cellulares*, I must confess myself sadly negligent. Only on two or three occasions, while waiting on the same spot for other parties, did I attempt to collect any. For the following list of some few *Mosses*, etc., which were thus collected, I am indebted to Dr. Taylor. Cellular plants abound in the Island of Flores, whence most of these, I think, came.

- ✓ 351 *Polytrichum formosum*, Hedw.
- ✓ 352 *Polytrichum elatum*, Schwaeg.
- ✓ 353 *Fontinalis antipyretica*, L.
- ✓ 354 *Hypnum alopecurum*, L.
- ✓ 355 *Trichostomum rigidifolium*, Tayl. ms.
- ✓ 356 *Bartramia fontana*, Swartz.
- ✓ 357 *Trichostomum fasciculare*, Hedw.
- ✓ 358 *Trichostomum canescens*, Hedw.
- 359 *Archidium phascoides*, Bridel.
- ✓ 360 *Diphyscium foliosum*, Mohr.
- ✓ 361 *Trichostomum polyphyllum*, Schwaeg.
- ✓ 362 *Polytrichum aloides*, Hedw.
- ✓ 363 *Bartramia fontana*, Swartz.
- ✓ ✓ 364 *Jungermannia juniperina*, Swartz.
- ✓ ✓ — *J. punctata*, Tayl. ms.
- ✓ ✓ — *J. complanata*, L.
- ✓ ✓ 365 *J. platyphylla*, L.
- ✓ ✓ 366 *J. Tamarisci*, Hook.
- ✓ ✓ 367 *Fegatella conica*, Tayl. (Fl. Hib.)
- ✓ ✓ 368 *Fegatella hemisphærica*, Tayl.
- ✓ ✓ 369 *Lunularia vulgaris*, Michel.
- ✓ ✓ 370 *Jungermannia pusilla*, L.
- ✓ ✓ 371 *Parmelia reticulata*, Tayl.
- ✓ ✓ 372 *Peltidea horizontalis*, Ach.
- ✓ ✓ 373 *Parmelia herbacea*, Ach.
- ✓ ✓ 374 *Parmelia lævigata*, Sm.
- ✓ ✓ 375 *Parmelia caperata*, Ach.
- ✓ ✓ 376 *Sticta pulmoncea*, Ach.
- ✓ ✓ 377 *Sticta damæcornis*, Ach.

- ✓✓ 378 *Stereocaulon paschale*, Ach.
- ✓✓ 379 *Parmelia leucomelas*, Tayl.
- ✓✓ 380 *Cenomyce gracilis*, Ach.
- ✓✓ 381 *Usnea plicata*, Ach.
- ✓✓ 382 *Cenomyce rangiferina*, Ach.
- ✓✓ 383 *Ramalina fraxinea*, Ach.
- ✓✓ 384 *Roccella tinctoria*, DC.

Description of a new British Species of HELIANTHEMUM; by
 J. E. PLANCHON, *Docteur en Sciences de Montpellier.*

(TAB. XXI.)

THE few annual species of *Helianthemum* which rank with *H. guttatum* in the section "*Tuberaria*," are remarkable for the deficiency of stipules to their lower leaves only, and for the absence of bracteas at the base of their pedicels. *H. guttatum*, especially, though a variable plant as regards size and pubescence, preserves in all stages its pedicels destitute of bracteas and diverging at right angles, even when the fruit is mature. The growing plant, with which I have been long familiar in the South of France, is thus characterized, and the same peculiarities exist in all the specimens I have examined from Spain, Italy and Central France. Being perfectly acquainted with the aspect of this pretty species, I could not recognize it in specimens, bearing the name of *Helianthemum guttatum*, which are preserved in the rich herbarium of Sir W. Hooker, to whom they were given by Mr. Wilson of Warrington, who had gathered them himself on the mountain of Holyhead, in the Isle of Anglesey. The straggling mode of growth, with short, numerous and dichotomous bunches of flowers, the existence of bracteas even to the upper flowers, and of pedicels, which at first slightly bend down, but rise up when the fruit is ripe and stand at an angle of forty-five degrees to the axis of the cluster, such were the characters, which at a first glance, suggested the idea that the plant was specifically distinct from *H. gut-*

nalis, *H. rupestris*, *Nostoc cæruleum*, *Raphidia viridis*, *Sorospora montana*.*

In order to afford some idea of the altitudinal range of the *Algæ* enumerated here, I add a list of such of them as have been observed at Aberdeen, near the sea level, *Bulbochæte setigera*, *Conferva ericetorum*, *Draparnaldia glomerata*, *Hassallia ocellata*, *Hæmatococcus binalis*, *Lyngbya Zonata*, *Nostoc commune*, *N. cæruleum*, *Raphidia viridis*, *Tetraspora lubrica*, *Tolypothrix distorta*.

The Hill of Fare, a nearly isolated range of small extent, not much exceeding 1000 feet at its highest point, commences about fourteen miles west from Aberdeen, and extends four or five miles nearly east and west. I have observed in its streams, *Lemania fluviatilis*, *Trentepohlia pulchella*, *Draparnaldia tenuis*, *Lyngbya Zonata*, *Batrachospermum moniliforme*, *B. vagum*,† and on wet rocks and in marshes on the higher parts of the hill at 600 to 800 feet, *Stigonema atrovirens*, *S. mamillosum*, and *Scytonema myochrous*.

It is scarcely necessary to remark that the *Desmidiæ* appear to have in general a greater altitudinal range than most of those *Algæ* enumerated here; it is, however, probable that future observations may add considerably to the number of species of the other tribes, growing at high altitudes.

Supplementary Notes on the BOTANY OF THE AZORES; by
H. C. WATSON, Esq.

By their geographical position, if not by their geological relations also, the Azoric Isles become invested with a

* *Pisidium nitidum* and *Colymbetes arcticus*? were seen in marshes at this altitude.

† *B. vagum* was observed some years ago in Loch Phadrich, near Castleton of Braemar, at about 2000 feet.

greater botanical interest than would otherwise appertain to their own scanty flora; which itself has probably been augmented by the importation of several species from Europe. The consideration of this peculiar interest induces me to print a supplementary list to the "Catalogue of Azorean Plants," which was published in the London Journal of Botany about three years ago (vol. 3, p. 582-617.) I am now enabled to add nearly fifty phænogamous species, discovered in the Island of St. Michael's, or San Miguel, (with very few exceptions) through the persevering researches of a resident botanist, Thomas Carew Hunt, Esq., Her Majesty's consul at the Azores.

And it seems desirable also to place on record some corrections and other notices relating to species included in the "Catalogue" formerly published, which subsequent cultivation of them in England, the receipt of more perfect specimens from Mr. Hunt, or the remarks of other botanists, have better prepared me to do. All the species enumerated in the subjoined supplementary list, excepting *Viola tricolor* and *Lolium perenne*, which were sent from Flores by Dr. Mackay, have been communicated to the Botanical Society of London or to myself, from the islands of St. Mary's (very few) and St. Michael's, by Mr. Hunt, together with an ample supply of duplicates of most of the rarer species of the Azores, for distribution to the members and correspondents of that active and useful Society. I may be allowed to observe here, while referring to Mr. Hunt's valuable exertions towards completing our knowledge of Azoric botany, that in sending his collected specimens to the London Society, he has taken the course which best insured their *immediate* distribution into numerous herbaria in England, Europe and America.

1. *Supplementary List of Azoric Species.*

- ✓ *Papaver Rhœas*, L.
- ✓ *Rapistrum rugosum*, Berg.

- ✓ *Capsella Bursa-pastoris*, *De C.*
- ✓ *Viola tricolor*, *L.*
- ✓ *Spergula arvensis*, *L.*
- ✓ *Hypericum Elodes*, *L.*
- ✓ *Erodium moschatum*, *Willd.*
- ✓ *Myrtus communis*, *L.*
- ✓ *Ononis arvensis*, *L.* (*Aut. Brit.*)
- ✓ *Vicia Bithynica*, *L.*
- ✓ *Lotus macranthus*, *Lowe.*
- ✓ *Prunus Lusitanica*, *L.*
- ✓ *Myriophyllum alterniflorum*, *De C.*
- ✓ *Alternanthera polygonoides*, *Br.*
- ✓ *Aichryson villosum*, *Webb.*
- ✓ *Daucus Carota*, *L.?*
- ✓ *Ammi Visnaga*, *Lam.*
- ✓ *Ammi Huntii*, *Wats.* (desc. infra, p. 384.)
- ✓ *Conium maculatum*, *L.*
- ✓ *Coriandrum sativum*, *L.*
- ✓ *Smyrnum Olusatrum*, *L.*
- ✓ *Vinca major*, *L.*
- ✓ *Erythræa lutea*, *R. et S.*
- ✓ *Myosotis arvensis*, *L.*
- ✓ *Cynoglossum pictum*, *Ait.*
- ✓ *Lycopus europæus*, *L.*
- ✓ *Lamium amplexicaule*, *L.*
- ✓ *Ballota nigra*, *L.*
- ✓ *Marrubium vulgare*, *L.*
- ✓ *Verbascum virgatum*, *With.*
- ✓ *Statice Limonium*, *L.*
- ✓ *Thrinia hirta*, *De C.*
- ✓ *Pyrethrum Parthenium*, *Sm.*
- ✓ *Senecio erraticus*, *Bert.*
- ✓ *Xanthium spinosum*, *L.*
- ✓ *Plantago Serraria*, *L.*
- ✓ *Amaranthus* ——— ?
- ✓ *Achyranthus argentea*, *Lam.*
- ✓ *Trichonema Columnæ*, *Reich.*

- ✓ *Allium subhirsutum*, L.
- ✓ *Ruscus aculeatus*, L.
- ✓ *Potamogeton lucens*, L.
- ✓ *Festuca elatior*, L.
- ✓ *Lolium perenne*, L.
- ✓ *Gymnogramma Loweii*, Hook. et Arn.
- ✓ *Lastrea multiflora*, Newm.
- ✓ *Lycopodium complanatum*, L.
- ✓ *Equisetum limosum*, L.

Mr. Hunt has also collected and sent examples of *Silene Armeria*, *Spiræa Filipendula*, *Cedronella triphylla*, and *Phleum pratense*; but accompanied by the suggestion, that they were introductions through cultivation or otherwise. Two others are marked doubtful in the list. The species which I enter doubtfully under the name of *Daucus Carota* (Linn.) is considered by Dr. Charles Lemann, to be "certainly *D. neglectus*, Lowe Prim. Fl. Mader." It also resembles the specimens distributed among Borgeau's Canary plants, under the name of *D. parviflorus* (Desf.). To the *Amaranthus* I am not able to assign a specific name with any confidence. Two other species are entered under names of most variable application. The *Potamogeton lucens* has narrower leaves than our British plant, and is without fruit. The *Festuca elatior* would be so named by English botanists; but it is not *Festuca pratensis* (Huds.); neither is it exactly the plant intended under name of *Festuca arundinacea* (Schreb.) in the 'London Catalogue;' though nearer to the latter than to the former, and probably the same as (or included in) *F. arundinacea* of Koch's Synopsis. It might seem strange that a conspicuous shrub, the *Myrtus communis*, should have been overlooked by Hochstetter and Guthnick as well as by myself, if truly native in the Azores. Mr. Hunt deems it to be truly indigenous, though now very scarce, through being in request with the tanners, and destroyed by them.

The *Ammi Huntii* appeared to be an undescribed species;

for I could find nothing corresponding with it in De Candolle's "Prodromus," or in the "Repertorium" of Walpers. And wishing that it should bear the name of its discoverer, I described it accordingly, in a paper communicated to the Botanical Society of London, in June, and to be reported in the Phytologist for July, 1847. It was distinguished from *Ammi majus* by the following character:

Ammi Huntii (H. Wats. ms.); caule glabro striato, foliis ternato-pinnatis bi-tri-pinnatisve, foliolis elliptico-lanceolatis margine cartilagineo inciso-serratis, involucri foliolis trifidis pinnatifidisve, segmentis linearibus subintegris vel lanceolatis inciso serratis (foliiformibus). A. majori propinquum, sed faciliter distinguendum. Herba verosimiliter annua seu biennis. Caulis ramis divergentibus sive (præcipue superioribus) divaricatis. Folia inferiora decomposita subtripinnata sive plus minus biternato-pinnata; foliolis 2-3 poll. long., 1-1½ poll. lat. Pedunculi petiolis vaginantibus oppositi. Umbellæ generalis radii numerosi (10-20) tenues divergentes. Umbellulæ multifloræ. Corolla parva alba. Habitat in insula Azorica "San Miguel;" claro T. C. Huntio coll. et comm., anno 1846.

2. *Notes on some of the species enumerated in the "Catalogue of Azorean Plants."*—(London Jour. Vol. III. p. 585.)

✓ 1. *Ranunculus cortusæfolius* (Willd.) var.—"This is not the true species, but the *R. grandifolius* of Lowe, which I formerly considered a variety of *R. cortusæfolius*, but, having since seen ripe fruit, I have changed my opinion, and believe it to be a distinct species."—P. B. Webb, Esq., in letter.

✓ 8. *Fumaria capreolata* (Linn.)—Perhaps equally near the Canary specimens distributed by Bourgeau, under the name of *F. media* (Lois.) and which do not seem to differ greatly from the *F. capreolata* of the same collection.

✓ 0. *Cardamine hirsuta* (Linn.)—Mr. Hunt sends specimens from St. Michael's. They belong to the form considered the typical one by British botanists, not to C.

sylvatica (Link). The latter is nearer *C. Calderarum* (Guth.) though distinct enough from that much prettier Azoric species.

✓ 14. *Raphanus Raphanistrum* (Linn).—Cultivation during four years in England, that is, during four descents of this annual plant, has partially annihilated the difference which was at first obvious between the pods of the Azoric and wild English plants.

✓ 15. *Cakile maritima* (Scop.) var.—The peculiar form of the pod, and its usually seminiferous lower joint, have hitherto proved hereditary in the plants raised in England; but the differences are too slight for specific diagnosis.

✓ 19. *Viola odorata* (Linn).—The Azoric plant is apparently the same thing with *V. Maderensis* (Lowe), but I fear it is neither truly aboriginal in the Azores, nor a species distinct from *V. odorata*. Mr. Webb thus remarks upon it by letter: "This is certainly the *Maderensis* of Lowe, but it is only one of the hundred forms of *V. odorata*."

✓ 31. *Arenaria macrorhiza* (Req.)—Specimens collected by myself, and others since communicated by Mr. Hunt, must belong to this species, according to the brief description in *Flora Azorica*, where it is enumerated as a variety of *A. marina* (Linn.) This latter is said, by Seubert, to be frequent on the coast rocks of all the islands. I do not recollect to have seen it there, but a maritime form of *A. rubra* was observed in some places, and the ordinary *A. rubra* (Linn,) more inland. Mr. Hunt also sends me ✓ *A. rubra*.

✓ 39. *Hypericum decipiens* (Wats.)—This, writes Dr. C. Lemann, "is identical with *H. Bæticum* of Boissier, who gives a figure, and remarks in his *Addenda* to the *Flora* of Spain, that it is probably only a variety of *H. undulatum* of Schousbæ, formerly considered a variety of *H. quadrangulum* (Linn) but quite distinct. We have this species also in Madeira." Most of the botanists to whom I communicated specimens of the Azoric plant, pronounced it to be "a southern form of *H. quadrangulum*." Thinking otherwise

myself, and not finding any description of the species in the Prodrômus of De Candolle, I published it as new, under the above name. I have no doubt now, that it is the *H. perforatum* of the Flora Azorica, although clearly distinguished from the Linnean *perforatum*, by its tetrapterous stem and other less obvious characters.

✓ 45. *Ilex Perado* (Ait.)—Possibly two species in the Azores; one with broader, more obtuse, and entire leaves; the other with the more oval leaves spinulose, or very acutely serrate at the margin. But we cannot find a diagnosis on such differences in an *Ilex*, unless accompanied by some other character, and the flowers and fruit of the second form are yet unknown to me. Dr. Seubert considers the two forms as a single species. And Dr. C. Lemann unites the Canary *I. platyphylla* (Webb) to the present species also.

✓ 76. *Rubus Hochstetterorum* (Seub.)—"A large southern form of *R. fruticosus*." P. B. Webb. If so, all our British *Rubi* are also but forms of *R. fruticosus*.

✓ 99. "*Daucus polygamus* (Gouan)."—Having received some additional specimens from Mr. Hunt, I can now confidently say, that there are two species, perhaps more, in the Azores. The two correspond tolerably well with our two English species, *Carota* and *maritimus*, or *Hispanicus*. Those which, to my eyes, look like *D. Carota*, are referred by Dr. C. Lemann to the *D. neglectus* (Lowe.)

✓ 100. "Umbellifera." (*Petroselinum Seubertianum*, Wats. infra).—Mr. Hunt informs me that my No. 100 must be the *Kundmannia Sicula* (Flo. Azo.) from the locality given for the plant so designated interrogatively in the work referred to. The description cited by Seubert (De Cand. iv. 212), is sufficiently applicable to bear out Mr. Hunt's suggestion; the fruit of the Azoric plant being unknown at the date of Seubert's Flora. But assuredly the plant of the Azores belongs to a different genus, by its fruit; and it presents other sufficient distinctions from a specimen of the *Kundmannia*, shown to me by Dr. C. Lemann. The fruit is very

small, and it is by no means with confidence that I now refer this dubious plant to the genus *Petroselinum*, where it will stand next to the *P. trifoliatum* (Wats.) According to present unnatural arrangements of the *Umbelliferae* into generic groups, I have felt obliged to separate the *Ammi Huntii* from these two; although the three species, united with a fourth from the Island of Flores (of which I possess only a single very immature specimen), might form together a natural-looking genus by their similarity of foliage and general habit. They combine badly with the other species of *Petroselinum*; and the *Ammi Huntii* is referred to its genus more on account of the pinnatifid involucre than aught else, though, on the whole, associating with *A. majus* better than the others do with any species of *Petroselinum*. In the annexed character I compare the new species with *P. trifoliatum*, thus:

✓ *Petroselinum Seubertianum* (H. Wats. ms.)—Caule striato divaricato-ramoso, petiolis vaginantibus, foliis ternato-pinnatis biternatisve, foliolis ovatis acutis basi sæpissime inæqualibus margine calloso omnibus (etiam supremis) dense serrulatis, involucri foliolis lineari-lanceolatis integerrimis, raro nullis aut caducis, involucelli ovatis cuspidatis marginibus membranaceis. Herba (annua seu biennis?) glabra, pedalis aut minor. Folia pinnata, biternata, &c. Foliola inæqualiter cordato-ovata, sæpius ovata, rarius elliptico-lanceolata. Pedunculi foliis oppositi vel in ramulis terminales. Umbellæ multiradiatæ 10—20. Umbellulæ multifloræ 20—40. Flores luteo-albidi? Kundmannia Sicula, *Seub. Flo. Azo.* 42. Habitat ad vias juxta litus insularum Pico et San Miguel. Præter characteres indicatos a *P. trifoliato* (Wats.) gracili, stricto, elato, distinguendum statura humiliori, caule robustiore, e basi fere ramosissimo, foliis crassis fere omnibus decompositis, et serraturis numerosis etiam in supremis.

✓ 105. *Viburnum Tinus* (Linn.) In the numerous specimens sent by Mr. Hunt, there are many with the bark of the young shoots densely hairy, others with the same part

quite smooth; but I do not see that this character is associated constantly with any other differences between the specimens.

✓ 113. *Campanula Vidalii* (Wats.)—Found by Mr. Hunt locally in St. Michael's and St. Mary's. Inflorescence racemose and few flowered, about 3 to 8, or paniced and many flowered, about 10 to 30; that is, varying with the luxuriance of the plants. The figure (Hook Icon. 684), was taken from a specimen with a few flowered raceme, and with the flowers scarcely sufficiently advanced for exhibiting the "corset-like contraction" near the middle of the corolla. It is not improbable that this remarkable contraction may be exaggerated in the dried specimens, owing to the thickness of the capsule, which will prevent the base of the corolla from contracting so much in proportion to the middle or upper part. Being glutinous, and of a texture between succulent and coriaceous, it is a troublesome plant to dry; both adhering to the paper, and becoming mouldy through the long retention of its moisture. It is, apparently, a true *Campanula*, as indicated by the more advanced fruit on some of Mr. Hunt's specimens.

✓ 122. *Erythræa Massoni* (Sweet)—"I can never believe this is the same as the Armorican plant." *P. B. Webb, Esq.*

✓ 128. *Myosotis Azorica* (Wats.)—I have raised numerous plants of this and the pale-flowered *M. maritima* (Hochst.) each year since 1842. They seldom survive to flower again a second season, although sufficiently protected from frost, a few degrees of which they will bear without injury. It is curious to observe that the rich deep colour of the corolla of *M. Azorica* has a tendency to fail in this country. My plants have run so much into varieties in the colour of the flowers, and even in the form both of flowers and leaves, that I am now unable to say of some of the specimens, whether they should be referred to *Azorica* or *maritima*; while, too, some of them approximate to the Canary species which is labelled "*M. sylvatica*," by Messrs. Webb and Bourgeau. In their wild state in the Azores, and the first year in England, they

appeared as easily distinguishable as any other two species of their genus; and, indeed, among the cultivated plants, equally distinct examples may still be found, although others run so much alike. All the specimens of *M. maritima*, which I collected in Pico, the only habitat in which I found the species, were growing on the rocks by the shore, exposed to the sun, and with very little soil for their roots. All were obviously unhealthy, being shrivelled, twisted and distorted, with fruit mostly abortive, and only 2 to 4 inches in height. But when grown in flower-pots in England, with a sufficiency of soil, supplied with water, and kept rather in shade, they become straight, healthy plants, of 12 or 18 inches high, bearing a resemblance to our *M. sylvatica*. Some of the pale-flowered examples of *M. Azorica* very nearly meet these highly developed examples of the *M. maritima*; not only in the pale tint of the flowers, but also in the more rounded segments of the corolla, and the enlarged circle or "eye" around the orifice of the tube; the segments or lobes of the corolla being obliquely cordate, and the "eye" very small, in the deep-coloured plants of *M. Azorica*. It would be difficult to express on paper the differences in those small folds or elevations of the corolla, which surround the orifice of the tube in *Myosotis*, *Primula*, &c.; but they afford practical distinctions to the eye, available for recognizing species.

✓ 148. *Hyoscyamus Canariensis* (Ker.)—"Not distinctly different from the *H. Albus* of Dalmatia, which is a very variable plant." *Dr. R. C. Alexander*, in letter.

✓ 150. *Sibthorpia Europæa* (Linn.)—It may be worth mentioning that two or three good botanists have sought to correct my labels for this plant, by intimations that it is the *Disandra prostrata*; but assuredly it is our English *Sibthorpia*. The *Disandra* has not been found in the Azores, though native of other Atlantic islands.

✓ 156. *Lysimachia Azorica* (Hornem.)—The specimens collected by myself in Fayal and Flores, and the plants raised from their seeds in England, were so easily distinguished from *L. nemorum* (Linn.) by their narrowly elliptic (not

subulate) calycine segments, and their procumbent (not prostrate and rooting) stems, with the less describable differences of colour and susceptibility to frost, that I did not hesitate to retain *L. Azorica* as a distinct species in my formerly published 'Catalogue.' Since that time I have received a root from St. Michael's, accidentally in the soil with other living plants, kindly sent to me by Mr. Hunt; and as this example from St. Michael's, as well as other dried specimens from the same island, stand between my former examples of *L. Azorica* and the English *L. nemorum*, both in the form of the calyx, and in their long, trailing, and occasionally rooting stems, I find it impossible now to indite any written character which will distinguish *L. Azorica* from *L. nemorum*. Nevertheless, the eye can do so by slight peculiarities of colour and form; and a frosty night shows most convincingly that some difference of constitutional susceptibility exists between the English species and its Azoric representatives, though the leaves of the latter will bear some few degrees of frost.

✓ 178. *Thrinchia nudicaulis* (Lowe).—It has been made quite clear by Mr. Hunt's specimens, that both this species and *T. hirta* (De Cand.) are found in the Azores. The chief character on which Mr. Lowe founded his species, is imperfectly obvious at an early stage in the growth of the fruit, and my own specimens being immature, and perhaps mingled, doubts arose in referring them to either, as mentioned in the "Catalogue."

✓ 180. *Tolpis umbellata* (Bert.)—The Azoric plant is doubtless identical with the *T. crinita* (Lowe) of Madeira; but scarcely distinct from the European *T. umbellata*.

✓ 182. *Tolpis macrorhiza* (De Cand.)—After examining numerous specimens from Mr. Hunt, I still consider that this species is an Azoric as well as a Madeira plant. Some of the specimens are referable to the *T. nobilis* (Hochst.) Besides these, there are many other forms among them, which do not well accord with either of the species here mentioned; but whether there are more than those two

species, or whether all the various Azorean forms belong to one or two very variable species, I do not feel myself prepared to say. Indeed, the genus *Tolpis* (or *Schmidtia*) in the Azores, seems to be as troublesome in species and varieties, as is that of *Hieracium* in Britain.

✓ 183. *Microderis rigens* (De Cand.)—I believe it may now very confidently be stated that the *M. umbellata* (Hochst.) is identical with the *M. rigens* (De Cand.) The scape varies in being glabrous or slightly hispid, and the inflorescence is strictly neither umbellate nor corymbose; though the latter term applies well enough in most cases.

✓ 188. *Bidens leucantha* (Willd.)—"A mere variety of *B. pilosa* (Linn.)" P. B. Webb, Esq.

✓ 200. *Senecio Maderensis* (De Cand.)—If we take the presence or absence of stipules, as the diagnostic character between *Maderensis* and *malvæfolius*, both species occur in the Azores. Judging by the specimens, living and dried, the latter may be a more robust plant; its stem rising to three feet high, under cultivation, and being as thick as a finger near the ground.

✓ 214. *Atriplex patula* (Linn.)—This species may be held doubtful. My specimens are in an early stage, and possibly belong to *A. rosea* (Linn.)

✓ 223. *Polygonum* * * * ? — This is identical with the species distributed among Bourgeau's Canary plants, under the name of *Persicaria serrulata* (Moq. et Webb.) As I found it myself in two of the islands, and have since received specimens from a third, St. Michael's, while I neither found, nor have received, the *Polygonum Persicaria*, it seems probable that the species enumerated under this latter name, in Flora Azorica, may be the *Polygonum serrulatum* (Lag.), and not the Linnæan *P. Persicaria*.

✓ 222. *Polygonum maritimum* (Linn.)—The straggling habit and long internodes of the plants raised in England, which led me to suspect the identity of *P. maritimum* (Linn.) and *P. Raii* (Bab.), belong only to those of the first season; as they become older, the shorter and more bushy habit of *P.*

maritimum becomes evident. Having cultivated both species under similar conditions, I am disposed to receive them as sufficiently distinct.

✓ 226. *Persea Azorica* (Seub.)—"It is a *verisissime* Laurel very nearly allied to *L. nobilis*, and the second species of the genus, distinguished by very few technical differences from its congener, principally the greater number of stamens, the female flower, &c. It is *Laurus Canariensis*, Webb. et Berth. Geogr. Bot. and Webb, Phytogr. Can. sect. 3, p. 227, t. 204, non Willd."—*P. B. Webb, Esq.*, in letter. Mr. Hunt thinks that there are two species under this name, in the Azores, and which are familiarly distinguished by the inhabitants.

✓ 230. *Euphorbia Styxiana* (Wats.)—Mr. Webb considers this only a large form of *E. mellifera* (Ait.) which attains an arborescent stature in the Canaries. Through the kindness of Mr. Hunt I am now in possession of several young living plants of it; and so far as can at present be seen, they tend rather to confirm than to oppose the suggestion of Mr. Webb. I intended the name to commemorate the Styx steam-vessel, not to be "Stygia."

✓ 238. *Urtica Azorica* (Hochst.)—Both Mr. Webb and Dr. Alexander pronounce this to be the *Urtica neglecta* (Guss.) Others have supposed it the *U. membranacea* (Poit.)

✓ 242. *Juniperus Oxycedrus* (Linn.?)—"This plant appears to me identical with a species I collected near Cadiz, on the sea-coast beneath the village of Barossa, (*vide* It. Hisp. p. 10,) and which I considered as *J. macrocarpa*. It is distinct from the Canarian *J. Cedrus* (Nob.) which becomes a fine tree, with pendulous branches, like those of the Goa Cedar."—*P. B. Webb, Esq.* The Azoric Juniper also becomes a tree, with a short stem, from one to two feet in diameter, and often with the branchlets elegantly pendulous.

252. *Potamogeton natans* (Linn.)—This, and perhaps n. 253 ("*P. heterophyllus*, Linn.?") also, may be really *P. fluitans* (Roth.)

- ✓ 254. *Luzula purpurea* (Wats.)—Quite different from n. 152 of Bourgeau's Canary plants, distributed under the name of *L. purpurea* (Link.) and *L. Berthelotii* (Nees). The specimens from Bourgeau approximate more closely to *Luzula elegans* (Lowe); and if the specific name "purpurea" is rightly applied to those specimens, it cannot be retained for the Azoric species. For a specific name to this latter, we must either adopt the inconveniently long "*purpureo-splendens*" of Seubert, or my own earlier one of "*Azorica*," which I proposed in this Journal, in 1843, (and used on my labels) instead of the incorrectly applied "*elegans*." I may refer to the 'Catalogue' for further explanations.
- ✓ 284. *Setaria verticillata* (Beauv.)—Mr. Hunt has fully confirmed this as an Azoric plant, by sending dried specimens of it from St. Michael's. It also came up in earth sent at the roots of other things from the same island.
- ✓ 293. *Deyeuxia Azorica* (Hochst.) — Dr. Charles Lemann pronounces my n. 293 to be *Piptatherum multiflorum* (Beauv.) It may still be the *D. Azorica* as well.
- ✓ 298. *Agrostis pallida* (De Cand.?)—The same excellent botanist considers my n. 298 to be certainly the *Deyeuxia caespitosa* (Hochst.); as, indeed, was suggested in the 'Catalogue.' It seems doubtful, however, whether either of these two plants should be placed in the genus *Deyeuxia*.
- ✓ 308. *Bromus mollis* (Linn.) *var.*—This variety (or, possibly, species) has now been raised four successive years in England, and preserves its peculiarities quite unchanged. But it is difficult to describe its differences on paper, compared with the ordinary state of *B. mollis*. The dense panicle, longer hairs, and more oblong form of the spikelets, give an eyesight distinction, but scarcely a describable one.
- ✓ 310. *Brachypodium sylvaticum* (Beauv.)—Both the glabrous and pubescent varieties have been sent from St. Michael's by Mr. Hunt.
- ✓ 331. *Nephrodium Fœnisecii* (Lowe.)—The typical form ("*alatum*" Lowe) is now clearly ascertained to be identical with *Aspidium dilatatum* *var. recurvum* (Bree, in Mag. Nat.

Hist. 1831), which is the *Lastrea recurva* (Newm.) of the present day, among English botanists. The identity having been pointed out to Mr. Newman, he announced the fact in the *Phytologist* for May, 1846. Mr. Webb independently arrived at the same conclusion about the same time, and mentioned it to me by letter, dated June 3, 1846. The oblong variety (“*productum*” Lowe) may be a distinct species, as is believed by Mr. Newman; but it appears nearer to *Lastrea recurva*, than to the *Lastrea multiflora* (Newm.), which is the *L. dilatata* of other English authors. It will be seen from the ‘Supplementary List,’ that this latter species has also been found in the Azores by Mr. Hunt. If that zealous botanist would collect a number of these *Lastreas*, it is far from improbable that we should make out more than these two species in the Azores.

- ✓ 345. *Ophioglossum vulgatum* (Linn.)—My specimens, collected in Flores, differed so very little from some English examples of *O. vulgatum*, that I referred them to this species; although they may be *O. Lusitanicum* equally. But I somewhat hastily assumed, that the *Ophioglossum* of the Flora Azorica must be the same species with that from Flores. Having since received from Mr. Hunt a few St. Michael’s specimens of a diminutive *Ophioglossum*, producing several narrowly lanceolate fronds from the same rhizoma, I cannot doubt that this is identical with the *Ophioglossum* from Terceira, described in Flora Azorica, under name of “*O. polyphyllum* (A. Braun!)” I trust Mr. Hunt will ascertain whether this small species or variety can be traced up to the larger *O. Lusitanicum* or *vulgatum*, by intermediate forms, or whether it is always diminutive in St. Michael’s, and regularly produces several leaves, barren and fertile, from a single root.

3. *Species enumerated in the Flora Azorica; but of which I have seen no specimens.*

✓ *Nigella arvensis*, L.

✓ *Chelidonium majus*, L.

- ✓ *Fumaria officinalis*, *L.*
- ✓ *Nasturtium flexuosum*, *Seub.*
- ✓ *Alyssum maritimum*, *L.*
- ✓ *Hypericum perforatum*, *L.*
- ? *H. decipiens*, *Wats.*
- ✓ *Ervum Lens*, *L.*
- ✓ *Trifolium lappaceum*, *L.*
- ✓ *Lotus Creticus*, *L.*
- ? *L. macranthus*, *Lowe.*
- ✓ *Medicago lupulina*, *L.*
- ✓ *M* ——— *pentacycla*, *De Cand.*
- ✓ *Potentilla anserina*, *L.*
- ✓ *Poterium Sanguisorba*, *L.*
- ✓ *Illecebrum verticillatum*, *L.*
- ✓ *Petroselinum sativum*, *Hoffm.*
- ✓ *Pimpinella dichotoma*, *L.*
- Kundmannia Sicula*, *De Cand.*
- ? *Petroselinum Seubertianum*, *Wats.*
- ✓ *Galium Mollugo*, *L.*
- ✓ *Scabiosa neglecta*, *Hornem.*
- ? *S. nitens*, *R. et S.*
- ✓ *Vaccinium Maderense*, *Link.*
- ✓ *V* ——— *longiflorum*, *Wickst.*
- ? *V. cylindraceum*, *Sm.*
- ✓ *Cicendia filiformis*, *Reich.*
- ✓ *Erythæa latifolia*, *Sm.*
- ? *E. Centaurium*, *Pers.*
- ✓ *Myosotis stricta*, *Link.*
- ✓ *Origanum Creticum*, *L.*
- ? *O. virens*, *Link.*
- ✓ *Lycopersicum esculentum*, *Dun.*
- ✓ *Euphrasia officinalis*, *L.*
- ✓ *Linaria Sieberi*, *Reich.*
- ✓ *L* ——— *cirrhusa*,
- ? *L. Græca*, *Chav.*
- ✓ *Tolpis barbata*, *Gaert.*

- ✓ *Gnaphalium Pensylvanicum*, Willd.
- ✓ *Chrysanthemum pinatifidum*, L.
- ✓ *Senecio pseudo-elegans*, Less.
- ✓ *Calendula officinalis*, L.
- ✓ ? *C. arvensis*, L.
- ✓ *Plantago media*, L.
- ✓ ——— *Lagopus*, L.
- ✓ *Chenopodium rubrum*, L.
- ✓ *Rumex strictus*, Link.
- ✓ *Polygonum Persicaria*, L.
- ✓ ? *P. serrulatum*, Lagasc.
- ✓ *Ricinus communis*, Lam.
- ✓ *Urtica Loweii*, Seub.
- ✓ *Scilla maritima*, L.
- ✓ *Ruscus androgynus*, L.
- ✓ *Lemna minor*, L.
- ✓ *Potamogeton pectinatus*, L.
- ✓ *Juncus maritimus*, L.
- ✓ *Scirpus maritimus*, L.
- ✓ *Carex rigidifolia*, Hochst.
- ✓ *Arundo brevis*, Roth.
- ✓ *Poa loliacea*, Huds.
- ✓ *Allantodea axillaris*, Kaulf.
- ✓ *Adiantum Capillus Veneris*, L.

In addition to the numerous specimens sent on different occasions by Mr. Hunt, both to myself and to the Botanical Society of London, I also received some others from Dr. Mackay, English vice-consul at Flores; and Mr. Sansom has shown me some few which had been brought to him from St. Michael's. But I have not yet been able to see Azoric examples of any of the above species enumerated in the Flora Azorica; some of which may be not truly native, (Ex.: *Chelidonium majus*, *Petroselinum sativum*,) while others may have been published under incorrect names, (Ex.: *Hypericum perforatum*, *Kundmannia Sicula*,) and others, again,

are confessedly garden plants, (Ex.: *Lycopersicum esculentum*, *Ruscus androgynus*.) By thus printing a list of such species, I may call the attention of Mr. Hunt and other botanists more particularly to them, and so eventually lead to their confirmation or rejection in any future Flora of the Islands.

ALGÆ TASMANICÆ: *being a Catalogue of the Species of ALGÆ collected on the shores of TASMANIA by Ronald Gunn, Esq., Dr. Jeannerett, Mrs. Smith, Dr. Lyall, and Dr. J. D. Hooker; with characters of the new species, by J. D. HOOKER, M.D., and W. H. HARVEY.*

In the 3rd. vol. of this Journal, p. 430 et seq., Dr. Harvey described a considerable number of the species now to be enumerated. Since the publication of his paper much time has elapsed, and other collections have reached us, which afforded several new species, whose characters are here given. Full descriptions of the whole, with figures of several of the more interesting, have further appeared in Dr. Harvey's "NEREIS AUSTRALIS," in the press.

Ser. I. RHODOSPERMEÆ, or FLORIDEÆ.

Fam. I. RHODOMELEÆ, *J. Ag.*

1. *Claudea elegans*, Lam.—*Harv. l. c. p. 430.*
HAB. George Town, *Mr. Gunn.*
2. *Dictymenia tridens*, Grev.—*Harv. l. c. p. 430. Ner. Austr. t. 7.*
HAB. George Town, *Mr. Gunn.*
3. *Dictymenia conferta*, Harv.—*Fucus confertus, Br. in Turn. Hist. t. 184. Delesseria conferta, Ag. Sp. Alg. 1. p. 177.*
Harv. *Ner. Austr. t. 8.*
HAB. Tasmania, *Mr. Gunn.* A single specimen.