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_Polybodium grammitidis_, Br.

On the West Coast of the South Island this plant exhibits a greater range of variation than usual. Mature sporiferous specimens collected by Mr. J. D. Eays are from 2 to 3 inches long, and not more than ¼ inch wide. The lower portion is cut into deltoid pinnules or lobes ½ of an inch long; the upper part is deeply toothed. In this state it closely resembles the Cingalese _P. cucullatum_, Nees, but the pinnules are broader at the base. Some of Mr. Hamilton's Okarito specimens have the pinnules lobed and worked to an excessive degree, in others the fronds are 8 to 10 inches long, pinnatifid, with simple entire pinnules. In others again the frond is similar, but the pinnules are slightly toothed. When in this state I am unable to distinguish this plant from _P. subfalcatum_, Blume, of the Malay Archipelago.

_Lycopodium ramulosum_, Blume.

Only known at present from this locality, and the vicinity of Hokitika. See Art. LXXIII.

P.S.—Since the above was written, Mr. Hamilton has informed me that _Celmisia bellidioides_ and _Euphrasia revoluta_ were collected near the face of the glacier, at an elevation of between 700 and 800 feet.

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Art. LXXI.—Notes on the Botany of Waiheke, Rangitoto, and other Islands in the Hauraki Gulf. By T. Kirk, F.L.S.

[Read before the Wellington Philosophical Society, 28th September, 1873.]

In few localities is the importance of atmospheric moisture, as a factor in the distribution of vegetable life, more forcibly demonstrated than amongst the small islands in the lower part of the Hauraki Gulf. Most of these islands consist of sandstones, clays, and slates, and are watered by springs and small streams. In every case the islands of this class exhibit a luxuriant vegetation, more or less copious in the number of species, according to the variety of soil, situation, and aspect. One or two of the smaller islands are composed of basaltic scoria, and are entirely destitute of water, except such as may be collected in rock-cavities during rainy weather, and are therefore entirely dependent upon atmospheric moisture for the maintenance of vegetable life. While both classes exhibit marked peculiarities in their botanical features, the most striking are those to be seen on islands of the latter class, destitute alike of surface soil and a perennial water supply.
In this paper I purpose to offer a brief account of the chief characteristics of the vegetation of these islands, and to draw attention to those features which have been most strongly developed by their respective physical peculiarities.

The largest island of the group is Waiheke, about thirteen miles in length, with a mean breadth of three and a-half miles, although in some places much wider. It is estimated to comprise 23,200 acres, of which 1,500 are laid down in grass. It consists chiefly of stiff clays, sandstones, and slates, and in its altitude and general characteristics bears considerable resemblance to the island of Kawau. The hills are low, nowhere exceeding 750 feet in altitude, the valleys are chiefly of an open character, and there are few deep ravines; most of the coast line is rocky; in fact, there are only one or two short pieces of sandy beach on the entire coast, and there are no extensive swamps. Manganese crops out on the surface in several localities, and is now worked in one or two places, forming an article of export. At the present time, partly from actual clearing of forest land and laying down in grass, and partly from the destruction effected by the constant browsing of cattle, coupled with frequent burning of the fern and manuka in the open country, the relative proportion between different species has become greatly altered, but there is no reason to suppose that even a single species has been extirpated.

The forest vegetation is usually of considerable luxuriance, although, as a rule, not remarkable for timber of large dimensions; to this however there are some notable exceptions. The kauri (Dacrydium cupressinum) was formerly plentiful in several localities, but has become extremely rare; as on the Great Barrier Island, so on Waiheke, it specially affected soils derived from the older rocks. The tooth-leaved beech (Fagus fusca) occurs in considerable quantity at the sea level, occasionally of large size; the rimu (Dacrydium cupressinum) also frequently attains large dimensions, but the totara (Podocarpus totara) is rare and always small; the maire (P. ferruginea) is rather more plentiful, and the matai (P. spicata) decidedly rare; I did not observe a single specimen of large size. The tawa (Nesodaphne tawa) forms a large portion of the forest in many places, while the taraire (N. taraire) is comparatively rare; the pukatea (Atherosperma nova-zealandiae), white pine (Podocarpus dacrydioides), and tanekaha (Phyllocladius trichomanoides) are not infrequent; puriri (Vitex littoralis), rata (Metrosideros robusta), hinuia (Elmocarpus dentatus), kowhai (Sophora tetraptera), mangiow (Tetranthera calicaris), kohe-kohe (Dyssoxylum spectabile), titoki (Aletrignon excelsum), toro (Persoonia toro), tipau (Myrsine salicina), mapau (M. australis), and others affording useful woods are found in most forest districts, although nowhere abundant. One of the most strongly marked
features in the sylvestral vegetation was the occurrence of large tracts of tea-tree forest (Leptospermum ericoides), these were so extensive and afforded such excellent firewood that for many years the chief portion of the Auckland firewood supply was derived from Waiheke. It is said that in addition to the supply from land in the possession of settlers, Government reserves were illegally denuded of thousands of tons by squatters, who considered it a violation of first principles to pay any thing in the shape of royalty, or acknowledge the authority of a government that did not consider the assertion of its rights a matter of importance. The value of this tree for small piles and for fencing purposes tended largely to accelerate its destruction, so that notwithstanding its former abundance there is now very little to be seen in the island, and the trivial amount of firewood still exported is of inferior quality.

Amongst the ornamental trees and shrubs which abound on the island are Quintinia serrata, with its handsome peach-coloured blossom, Weinmannia silicicola, the flowers of which are much more showy than those of its southern ally, the ngaio, (Myoporum latum), Fuchsia excorticata, Olearia cunninghampii with its numerous corymbs of white flowers so well known throughout the colony; and O. furfuracea restricted to the north; Carmichaelia australis, Metrosideros floroida, Clematis indivisa, and many other species characteristic of the Northern forest. Two plants, however, require special notice. Coprosma arbores, the largest species of the genus, forms a considerable proportion of the less luxuriant forest growth in several localities, but as the wood of this tree gives off an unpleasant odour when burning, it is usually left standing by the firewood cutters, although occasionally sought after by the inlayer on account of its peculiar yellow colour. Ateosmosia macrophylla, so characteristic of the undergrowth of the Northern forest generally, is abundant in some parts of the island, its pendulous crimson flowers diffusing their grateful perfume over a considerable area. The so-called kauri grass (Astelia trinervia), is abundant in several of the forest districts.

On the cliffs, and on the margin of forests by the sea, the splendid pohutukawa (Metrodios tomentosa) attains a large size and is still plentiful, although often recklessly destroyed. Sapota costata occurs in a few sheltered bays, but it is rarely of large size, Pittosporum crassifolium is occasionally seen, but only near the beach; Hymenantha tasmanica was observed on the Oinitangi sands, and most of the ordinary maritime plants may be found by careful search.

The open ground is covered with fern (Pteris esculenta) or with scrubby manuka (Leptospermum scoparium), intermixed with a sparse growth of dwarf shrubs, grasses and other herbaceous plants: amongst the former, Poma-
derris phylleifolia is, perhaps, the most abundant; Dracophyllum squarrosum, Leucopogon fasciculatum, L. frazeri, Cyathodes acerosa, Gaultheria antipoda, Coriaria rupefolia, etc., are common. The more frequent grasses and herbaceous plants are Sporobolus elongatus, Agrostis amula, A. quadriseta, Triticum multiflorum, Poa anceps, Dichelachne crinita, Microloma stipoides. Glyceria stricta was collected in a single locality on the coast. Geranium molle, G. microphyllum, G. dissectum, Oxalis corniculata, Pelargonium clandestinum, Acana sanguisorba, Haloragis alata, H. diffusa, Epilobium pubens, E. juncenum, E. rotundifolium, E. nummularifolium, Daucus brachiatus, Gnaephyllum coltimum, G. luteo-album, G. involucratum, Wahlenbergia gracilis, etc., etc. In most places Cladium sinclairii, C. punnii, Schenus tendo, S. tenax, etc., with a few orchids, of which the most frequent were Microtis perrofia, Thalymitra longifolia, and Orthoceras solandri. Phormium tenax, with several species of Juncus, Carex, Gaillia and other sedges, occurred in marshy places, especially on the borders of forests, but, as a rule, paludal plants were poorly represented.

Arborescent ferns are represented by Cyathea medullaris, C. dealbata, Dicksonia squarrosa, and very rarely by Hemiheelia smithii; none of the rarer kinds were observed. The ferns and allied plants generally were remarkably few in number; besides the tree ferns, the most striking are Lomaria frazeri, and Lycopodium articulatum.

I have already mentioned the general resemblance between the chief physical features of the Kaua and Waiheke. Although the total number of ferns on the latter island is greatly below that of the Kaua, the resemblance between the Phanogamie portion of the flora of both is remarkably close. I can only enumerate three plants as occurring on Waiheke, which are not also found on Kaua: they are Hymenathora tasmanica, Pimelea arenaria, and Melicytus micranthus; the first and second of these are extremely rare, the third occurs in several localities, and in all probability is to be found on Kaua, although not observed either by Mr. Buchanan or myself.

The kauri and tooth-leaved beech, both of which are rare on Kaua, occur or rather have occurred on Waiheke in considerable quantity. Coprosma arborea is also more plentiful on the latter island than the former, and the same remark applies to Metrosideros robusta, of which only a single specimen is known in Kaua. The large tea-tree, although plentiful on that island, never occurred in such great abundance as on Waiheke. On the other hand, one of the most characteristic plants of the Kaua flora.

* Of course excluding numerous species, such as Gnaphalium filicaule, Juncus novae-zealandiae, Uninia rubra, Eryngium vesiculorum, etc., etc., erroneously recorded as indigenous on Kaua. See Trans. N.Z. Inst., IX., pp. 525-527.
Cordyline puntillo, is extremely rare on Waiheke. Sapota costata attains its greatest dimensions on Kawan, but is small on Waiheke; while Pitosporum tenuifolium, P. crassifolium, and other species are not nearly so frequent on Waiheke as on Kawan.

Waiheke may be considered to possess a moderately copious flora, exhibiting a great amount of luxuriance and vigour, although its most important species are far from attaining extreme dimensions, the greatest amount of variety as well as the most luxuriant growth being found in the deeper portions of the forest, or in sheltered bays by the sea. The least amount of variety is found on the open fern or tea-tree lands on the higher parts of the island.

The other islands are of smaller size than Waiheke, the largest not comprising more than one-fourth of the acreage of that island. Ponui contains 4,728 acres, and presents similar geological features; its flora is less copious than that of Waiheke, its most noticeable feature being the abundance of Brachyglossis and other low-growing shrubs.

Motutapu has an area of 3,728 acres, more than half of which is laid down in excellent grass, most of the remainder being manuka or open fern land; yet, notwithstanding the unfavourable conditions which exist upon this little island, upwards of two hundred and forty species of phanogams and ferns were catalogued; about forty-five of these were naturalized plants, chiefly of agricultural introduction, the most noteworthy being Myosotis colina, Hoffm., which has not been observed elsewhere in the colony, so far as I am aware. Nothing in the shape of arboreal vegetation is to be found, except in sloping places on the cliffs, and in one or two bays, where magnificent specimens of the pohutukawa are still to be seen, rarely associated with Sapota costata and Corynocarpus leavigata. Ferns are extremely rare, and the bulk of the native vegetation is either littoral or ericetal in its character. Two native grasses, Trisetum antarcticum and Triticum multiflorum, are more plentiful than in other parts of the Auckland district. Motutapu consists of sandstones and clays, the former sometimes so regularly stratified as to present an artificial appearance.

Motuihi contains about 460 acres, more than half of which is pasture. The open, uncleared portion is chiefly covered with manuka or fern, and patches of large arboreal vegetation are to be found on the slopes, the most important member being the pohutukawa, which attains large dimensions. On a charming miniature sandy beach, Dichelachne stipoides, Pimelea arenaria, Paspalum distichum, and Sicyos angulatus are plentiful. The last-named has not been observed on any other of these islands.

Of the vegetation of Little Motutapu (Rukino), containing only 450 acres, and of Pakihi, containing 280 acres, nothing is known.
Te Rotoroa contains 204 acres. Its flora is chiefly remarkable for the profusion of *Entelea*, associated with *Brachyglottis*, *Coprosma*, *Veronica*, and other small shrubs. The plants of Motuora are of a similar character.

Motukore, or Brown's Island, has an area of 150 acres. It is chiefly volcanic, and contains one of the most perfect craters to be found in the Auckland system. With the exception of the lava field, which forms a large portion of the lower part of the island, the whole has been laid down in grass, and presents no botanical features of special interest. In a few places, where water accumulates in spaces amongst the blocks of lava, or percolates through them from the sea, *Typha latifolia*, *Scirpus maritimus*, and other algal plants are found in some quantity. In other parts of the lava field a dense growth of bushy shrubs attracts attention. *Olearia furfuracea* and *Metrozylon tomentosa* occur sparingly, but the latter is usually of small size.

The volcanic island of Rangitoto, which forms so prominent a feature in the scenery of the Hauraki Gulf, possesses greater interest to the botanist than any other island in the group. This arises less from a copious flora—although the number of species is comparatively large—than from the remarkable state of the ligneous vegetation, which exhibits the utmost luxuriance of foliage and flowers on the most diminutive specimens, and from the peculiar conditions of growth, most of the plants springing directly from the face of the rocks or from the crevices between them. A brief description of the island will enable us better to understand the peculiarities presented by its flora.

Rangitoto is roughly circular in outline, with deep indentations; its greatest diameter is about four miles; its least two and a-half miles; it is estimated to contain 6,044 acres, and is next in size to Waiheke. Its base consists of an irregular lava field, rising towards the centre at an angle of four or five degrees. From near the centre the scoria cone, which forms the crater, rises at an angle of about 35 degrees to the height of 980 feet. The cone is double, but the outer one has been carried away in places; the inner and more elevated cone forms the largest and best preserved crater to be found in the Auckland system. It is considered to be the latest manifestation of volcanic activity in the Waiheata district. Although only 200 feet higher than the highest point of Waiheke, its isolated peak is frequently surrounded by clouds, while the whole of the adjacent isthmus is suffering from want of rain.

The lava field, which forms the chief portion of the island, is extremely rough and difficult of examination, being broken up into chasms, ravines, and irregular depressions; for the most part progress can only be made by leaping from one sharp-edged block of scoria to another, or by scrambling.
up one side of a ridge to descend on the other. The central cone, which forms but a small part of the whole, consists of loose cinders and ashes, into which the feet sink at every step of the ascent. The island may therefore be regarded as a huge filter, through which the rain percolates, so that a perennial stream or even a spring is an impossibility; in fact, the island is entirely destitute of water, except the small quantity that during rainy weather accumulates in rock-cavities, and which is speedily evaporated. The formation of surface soil is impossible under such conditions, since the comminuted particles of rock or ash are washed into the interstices of the rocks by every shower, or blown away by every breeze.

Yet under these antagonistic conditions, less favourable on the whole to vegetable life than even the pumice-covered plains of the Taupo district, we find a flora comprising fully one-seventh of the entire number of flowering plants and ferns indigenous to the colony always exhibiting extreme luxuriance of foliage, although its larger members are greatly dwarfed in stature, and at certain periods of the year presenting an amount of floral splendour which finds no counterpart in the southern portions of the colony.

In many places the chasms and depressions are occupied by a most luxuriant growth of Mosses, Hepaticæ, and Lichens, the most frequent of which are Hymenium furfuraceum, Chandonanthes squarrosus, Polyotus claviger, Trichocolea tomentella, Sendtnera flagellifera, Cladonia rangiferina, C. cornucopoides, etc. On the dry exposed rocks, Racemitrium lannyinosum forms large patches, which become brittle during intervals of dry weather, but revive with the first showers: this is the only locality in which it descends to the sea-level in New Zealand. Growing amongst the cool mosses are several delicate ferns, Hymenophyllum sanguinolentum, H. rarum, H. multifidum, and especially Trichomanes reniforme. Other ferns of coarser growth are not uncommon, while Cheilanthes sieberi, a characteristic plant of the Auckland volcanic district, is plentiful on the driest rocks. One of the most interesting plants on the island is the tropical Peilotum triguetrum, which occurs in abundance, usually springing from the face of rocks. Dendrobium cunningham-hamii produces its beautiful flowers in greater profusion and of larger size than I have seen them elsewhere, and the fragrant Eriina mucronata is abundant. There is a sprinkling of grasses comprising eight or ten species, with a few common herbaceous plants, but the most interesting feature of the flora is the occurrence of Metrosideros tomentosa, M. robusta, Griselina lucida, Pittosporum crassifolium, Knightia excelsa, and other trees, often in a diminutive condition, but laden with glossy foliage of the greatest luxuriance, and flowers of deeper and brighter tints than are produced under ordinary conditions.

On the clay cliffs of the adjacent islands, Metrosideros tomentosa attains a
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height of from fifty to eighty feet, with a trunk from two to three feet in diameter; in its natural condition it rarely flowers before attaining the height of from twenty to thirty feet, but on Rangitoto compact charming specimens one to three feet high were covered with brilliant flowers; scarcely a plant was to be seen over twelve feet in height, but nearly all were splendidly in flower. Near the base of the cone I observed two specimens of a peculiar form of this species, with the leaves and flowers of smaller size than in the typical form; the leaves glabrous and coriaceous, closely approaching M. polymorpha. Griselinia lucida exhibited a similar phenomenon, specimens of the staminate plants being covered with panicles of yellow flowers, much more deeply coloured than I have seen them elsewhere, and forming a strong contrast with the fiery crimson of the pohutukawa. Metrosideros robusta was less common than its close ally, but occasionally attained a larger size, being only exceeded in height by Pittosporum crassifolium. Other trees occurred in a similarly dwarfed condition, as Alectryon excelsum, Tetranthera calcaris, etc., but all were cast into the shade by the bright flowers of the ratas and Griselinia. The vegetation of the cone itself is extremely meagre, diminutive specimens of Leptospermum scoparium and Pomaderris phyllicifolia are mixed with species of Geranium, Gnaphalium, Epilobium, Erechtites, and especially with Vittadinia australis, a plant decidedly rare in the vicinity of Auckland. The whole presented but few points of interest.

I append a list of the plants catalogued on this remarkable island, and with a few observations on the cause of the peculiar condition of its ligneous vegetation will conclude this paper.

It has been pointed out that while the plants of this section are depauperated as to size, yet in other particulars they exhibit the greatest possible luxuriance; pigny specimens of pohutukawa, Griselinia and others, develope foliage and flowers of larger size and brighter colours than those produced under the most favourable circumstances.

This result can only be attributed to the joint operation of two causes: the large amount of moisture present in the atmosphere, and the extremely comminated condition of the small modicum of soil from which the plants extract their nourishment. The latter condition admits of a freer circulation of air, saturated with moisture, about the roots than is possible in stiff soils, and facilitates the absorption of the mineral constituents which are requisite for the growth of the wood, while the limited quantity in which these elements are available, and the brief occasional checks to growth during periods of drought, have a direct relation to the reduced size of the plants. The influence of atmospheric moisture is shown in the luxuriant and glossy foliage, thus affording another proof, if such be wanting, of the
absorbing powers of leaves, a function of late years overlooked, or altogether denied, by physiologists.

The lava fields of the Auckland Isthmus afford proof of the correctness of these conclusions. Although not more than from six to ten miles distant in a straight line their ligneous plants do not exhibit the same peculiarities as those of Rangitoto. Owing to the longer interval that has elapsed since their formation, a much larger quantity of soil is found amongst the rocks, so that in many places the titoki, mangia, kohe-kohe, rowa-rewa and other trees attain their average dimensions. The largest specimens of *Griselinia lucida* that I have met with grew amongst the rough scoria near Mount Eden, but owing to the comparatively small amount of atmospheric moisture the leaves present an ordinary appearance, and the extremely luxuriant foliage so characteristic of the woody vegetation of Rangitoto is not developed.

Catalogue of Phænogamic Plants and Filices collected on Rangitoto Island.

I have to express my indebtedness to Mr. T. F. Cheeseman, for my knowledge of several interesting plants not observed by me, and have distinguished them by affixing his initials in each case.

* Naturalized plants are distinguished by an asterisk.

**DICOTYLEDONS.**

*Clematis indicia*, Willd. T.F.C.
*Ranunculus plebeius*, Br. hirtus, Banks and Sol. arculis, Banks and Sol.
*Cardamine hirsuta*, L.
*Lepidium oleraceum*, Forst.
*Melicytus ramiflorus*, Forst.
*Pittosporum crassifolium*, Banks and Sol.
*Stellaria purpurea*, Banks and Sol. T.F.C.
*Silene quinquefolia*, L.
*Plagiopetalus dicaricus*, Forst.
*Linum monogynum*, Forst.
*Geranium dissectum*, L., var. carolinianum, a. and β.
*Pelargonium australis*, L., var. clandestinum.

*Melicae ornata*, Forst.
*Dysosyllum spectabile*, Hook. f.
*Pouawera phyllophila*, Ladd.
*Dodonera viscosa*, Forst.
*Alectryon exsulans*, DC.
*Corynocarpus lutosus*, Forst.
*Cusoria ruscifolia*, L.
*Carmichaelia australis*, Hook. f.

*Sophora tetraptera*, Ait.
*Rubus australis*, Forst., β. and γ. T.F.C.
*Acana angustifolia*, Vahl.
*Amelanchier persica*, L.
*Tiliae verticillata*, DC.
*Drosa auriculata*, Backh. T.F.C.
*Haloragis alata*, Jacq. tetraptera, Labill., β. dif-fusa

*Leptospermum scoparium*, Forst.
*ericoides*, A. Rich.
*Metrosideros florula*, Sm.
*robotu*, A. Cunn.
*tomentosa*, A. Cunn.
*var. semiplena*, Banks and Sol.
*Fuchsia excorticata*, Linn. fil.
*Epilobium nuttallero-sium*, A. Cunn.
*tetragonum*, L.
*juccaceum*, Forst.
*pubescens*, A. Rich.
*Mesembryanthemum australi*, Sol.
*Tetragonia expansa*, Murray.
*Hydrocotyle asiatica*, L. T.F.C.
*Aptum australis*, Thouars.
DICOTYLEDONS—continued.

Apium filiforme, Hook.
Daucus brachystachus, Sieber.
Panax arborescens, Forst.
Schlechteria degitata, Forst.
Griselinia lucida, Forst.
Coprosma robusta, Raoul.
lucida, Forst.
baneriana, Endl.
Galium umbrosum, Forst.
Olearia furfuracea, Hook. f.
solandra, Hook. f.
Vitexina australis, A. Rich.
Lagenophora forsteri, DC.
Bulnesia fruticosa, L.
Cassinia leptophylla, Br.
Gnaphalium lanatum, L.
involutum, Forst.
collinum, Labill.
Senecio glastifolius, Hook. f.
T.F.C.
laulus, Forst.
Erechites argyta, DC.
scaberrima, Hook. f.
quadridentata, DC.
Brachylotis repana, Forst.
Sonchus oleraceus, L., B. asper
* Helminthia echinoides, Gart.
* Hypocharis radicata, L.
* Trijeran canadensis, L.
* Carduus lanceolatus, Gart.
Wahlenbergia gracilis, A.D.C.
Lobelia aurea, Thunb.
Selliera radicans, Cav.
Gantheria antipoda, Forst.
Cyathodes aeroxos, Br.
Leuropogon fasciculatus, A. Rich.

Myrsine urvillei, A.D.C.
Samolus repens, Pers.
* Anagnita arvensis, L.
Parsonia albiflora, Raoul. T.F.C.
Gentianella longifolia, A. Cunn.
* Erythraea centaurium, L.
Convolvulus sepium, L.
tupariurn, Forst.
solanum, L.
Dichondra repens, Forst.
Solanum arceulare, Forst.
viagrum, L.
* Physalis peruviana, L.
Veronica salicifolia, Forst.
Vitex littoralis, A. Cunn. T.F.C.
Arctotis officinalis, L.
Meyornum latum, Forst.
Chenopodium glaucum, L., var. ambig.
num
Suaeda maritima, Dumortier.
Salicornia australis, Soland.
Scleranthus biflorus, Hook. f.
Muhlenbeckia adpressa, Labill.
complexa, Meisn.
* Rumex viridis, Sibthorp.
Tetranthera callidens, Hook. f.
Hedysarea dentata, Forst.
Knightia excelsa, Br.
Pinus prostrata, Vahl.
virgata, Vahl. T.F.C.
Euphorbia glauca, Forst.
Parietaria debilis, Forst.
Peperomia urvilleana, A. Rich.
Piper excelsum, Forst.

MONOCOTYLEDONS.

Farrina mucronata, Lindl.
Dendrobiurn cunninghamii, Lindl.
Dulcephyllum pygmaenum, Lindl.
Ariantus sinclairii, Hook. f.
Microtis porrifolia, Spreng.
Thelymitra longifolia, Forst.
Praephyllum pyramidale, Hook. f.
T.F.C., a single specimen only.
Orthoceras solandri, Lindl.
Triplochi triandrum, Mich.
Zostera "marina," L.
Cordyline australis, Hook. f. T.F.C.
Dianella intermedia, Endl.
Astelia cunninghamii, Hook. f.

Astelia solandri, A. Cunn.
bankii, A. Cunn.
trinervia, Kirk.
Phormium tenax, Forst.
Luzula campestris, DC.
Cyperus ustulatus, A. Rich.
Isolaevalus nodosa, Br.
Galania lacera, Steudel.
arenarin, Hook. f.
Carex lucida, Boott.
brevispatha, Br.
ramiflora, Boott.
dissecta, Soland. T.F.C.
lambertiana, Boott.
Paspalum scorobiculatum, L. T.F.C.
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**MONOCOTYLEDONS—continued.**

*Panicum imbecille, Trin.*

*Anthoxanthum odoratum, L.*

*Phalaris canariensis, L.*

*Dichanthae stenopoeides, Hook. f.*

*Erinacea, Hook. f.*

*Scirpus, Hook. f.*

*Agrostis semia, Br.*

*Billardieri, Br.*

*Arundo conspicua, Forst.*

*Danthonia semi-annularis, Br.*

*Echinopogon ovatus, Palisot.*

*Cynodon dactylon, L.*

*Dactylis glomerata, L.*

*Poa imbecilla, Br.*

*Acype, Forst.*

*Briza minor, L.*

*Bromus sterilis, L.*

*Arenarius,*

*Festuca myurus, L.*

*litoralis, Br.*

**CRYPTOGAMIA.**

*Hymenophyllum multifidum, Swartz.*

*Rarum, Br.*

*Polyanthos, Swartz.*

*β. sanguinolentum*

*Demissum, Swartz.*

*Trichomanes reniforme, Forst.*

*Humile, Forst.*

*TF.C.*

*Adiantum affine, Willd.*

*TF.C.*

*Cheilanthes sieberi, Kunze.*

*Pellia rotundifolia, Forst.*

*Pteris aquilina, L.*

*Var. esculenta*

*Tremula, Br.*

*Lowaria filiformis, A. Cunn.*

*Doodia media, Br.*

*Var. connexa*

*Asplenium obtusatum, Forst.*

*Lucidum, Forst.*

*Asplenium flabellifolium, Cav.*

*Jaceatum, Lam.*

*Bulbiferum, Forst.*

*T.F.C.*

*Flaccidum, Forst.*

*Aspidium richardi, Hook.*

*Nephradium globuliferum, Cunn.*

*Polypodium graumitideis, Br.*

*Serpens, Forst.*

*Cunninghamii, Hook.*

*Pustulatum, Forst.*

*Billardieri, Br.*

*Nothochlora distans, Br.*

*T.F.C.*

*Bryochium ternatum, Swartz.*

*T.F.C.*

*Lycopondium billardieri, Spring.*

*Tinesipteris forsteri, Endl.*

*Psilotum triquetrum, Swartz.*

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**ART. LXXII.—On the Export of Fungi from New Zealand.**

By T. Kirk, F.L.S.

[Read before the Wellington Philosophical Society, 11th January, 1879.]

In several striking characteristics Fungi bear a similar relation to all other plants to that borne by Insecta to all other animals. A larger number of plants is included in Fungi (regarded as a single order) than in any other group of similar value. The largest number of similar animals is comprised under Insecta. Each group exhibits a large amount of polymorphism and parasitism. Each contains many species injurious to man, and but few from which he derives direct benefit. While other large groups of

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* This assertion is at variance with the comparative estimates of the number of species comprised under different natural orders as stated in Botanical Text Books, but is warranted by the known results in countries where Fungi have been investigated with some approach to completeness. In Great Britain, for instance, over 8,000 species of Fungi are known, considerably more than twice the number of Phanogams and Filicales put together.