

from the handy living British plant, serves for all. I very much fear that this systematized amalgamation of ferns from all countries, however opposite in climate and geology (although a very good thing in itself, and when not pushed to extremes), will be hereafter found to have been injuriously carried too far with not a few of our New Zealand ferns. To this subject I hope to return anon.

ART. XLIX.—On some new and undescribed New Zealand Ferns.

By W. COLENSO, F.L.S.

[Read before the Hawke's Bay Philosophical Institute, 8th November, 1880.]

HYMENOPHYLLUM PYGMÆUM, n.s.

Rhizome capillary, creeping, spreading, much-branched and entangled, tomentose with fine red hairs; *plant* of densely matted growth; *stipe* 1–2 lines long, erect, solitary, 2–3 lines apart, sometimes two together springing from a node of the root-stock, filiform, terete, naked, sometimes bearing a few scattered minute weak reddish scales; *frond* 2 lines long including involucre, 2–4 lines broad, fan-shaped in outline, colour light green, glabrous, pinnate, generally one pair of pinnæ (very rarely two pairs, or three single ones, or a single pinna), which are petiolate, sub-opposite, and inclined upwards; *pinna* 1–2 lines long, membranaceous, broadly oblong, narrowest downwards, costa stout, not reaching to the margin, apex very obtuse and margin there entire, sides of pinnæ lacinated or slashed, teeth 3–5 on a side, long, acuminate, falcate, and only of the cellular substance of the pinnæ; *involucre* ob-conical, free on apex of short rhachis, 1½ lines long, 1 line broad at top, bearing a few scattered soft spinulose processes; *valves* scarcely rounded, divided less than half-way down, fimbriated with 14–17 translucent flexuose and subulate long green teeth or cilia wholly composed of cellular tissue (a truly beautiful object under a microscope); *receptacle* included, or slightly protruding in age.

Hab.—On cliffs, Preservation Inlet; on rocks, Resolution Island; and on rocks at the Bealey, J. D. Enys; hills round Lyttelton Harbour, Westland, coast south of Hokitika, etc.

This very minute fern (probably the smallest of the many small forms of *Hymenophyllum*, and perhaps the smallest of all truly pinnate ferns) has been long known to me, but only through kind friends and correspondents; for, although I have received a copious supply of specimens both dried and living, I have never gathered it myself. It has always been

sent to me, from various sources, bearing the name of "*H. minimum*;" the correctness of which name I have ever doubted, but as I had never seen an authentic specimen or botanical drawing of that fern I did not greatly care to controvert, although I never could make my specimens to agree with the several published descriptions in my possession of *H. minimum*. Desirous however of deciding the point, I have recently obtained from Paris a copy of the Botany of the voyage of the "Astrolabe" (Admiral D'Urville) by Lesson and Richard, with its folio atlas of plates, in which that New Zealand fern is fully described by its discoverer, together with several drawings of the whole plant with dissections; and I very soon found that my conjecture was true, and that this little fern which I have here described has scarcely any affinity with A. Richard's plant *H. minimum*, which is altogether distinct, belonging to a widely different natural section of the genus *Hymenophyllum*.

Indeed, I can scarcely understand how this fern came to me so commonly, and for so long a time, too, considered as A. Richard's plant, except perhaps from its possessing a single terminal involucre, its small size, and its specific name (!) which, combined, seem to have led collectors astray. (I believe that this plant has been also published, name only, in some preceding volume of the "Transactions," as the real *H. minimum*!) That plant I have never yet seen, and I almost venture to doubt of its having been again found in New Zealand since D'Urville's visit in the "Astrolabe," who discovered it.* Dr. Hooker, however, did find it at the Auckland Islands, and has given a full and particular account of it in the "Botany of the Antarctic Voyage," Vol. I., p. 103.

It has been the fate of the true *H. minimum* to be very unfortunate (like not a few others of our New Zealand ferns)! More than fifty years have passed since its discovery in New Zealand, it was soon however published at Paris to the scientific world, and well, too—both in descriptions

* I am aware that Dr. Hooker, in his "Handbook of the New Zealand Flora," under *H. minimum*, says,—“Middle Island, Otago, *Hector* and *Buchanan*;" but I am not certain whether that information was obtained from specimens or from a letter. Be this as it may, Dr. Hooker also says (*l.c.*),—"North Island, on roots and stumps of trees, *D'Urville*, *etc.*;" which is, I think, an evident error, and it is almost certain that the French Botanists must have obtained their specimens in Tasman's Bay ("*Hâvre de l'Astrolabe*") on the south side of Cook Straits, where they spent some time and obtained many novelties. Moreover, who the other Botanists or collectors can possibly be (included in the "*etc.*" of Dr. Hooker), who found the *H. minimum* (A. Richard), in the North Island, I cannot imagine. I know that the Cunninghams did not detect it (Allan, C., in the specific description of it in his "Specimens of the Botany of New Zealand," merely copying from A. Richard); and, as I have already mentioned, I never found it, although I always sought it most assiduously.

and drawings with dissections. Notwithstanding Sir W. J. Hooker, in his celebrated "Species Filicum," (published some fifteen years after), included it under *H. tunbridgehense*, as a mere synonym of that plant, not even allowing it to be a variety! And more lately, Baker (of Kew), in his "Synopsis Filicum," has only tardily admitted it to a place, as a species, in the Appendix to that work. Bentham in the last volume of the "Flora Australiensis," has included it therein—but only as having been found on one spot, on Lord Howe's Island. Can it be, that this little fern (*H. minimum*), is both a littoral plant and a lover of rocky islets? All present book evidence tends that way. D'Urville may have originally found it on one of the many islets or cliffy headlands in Tasman's Bay. And here it is to be noted, in passing, that while the precise spot is given of not a few of the New Zealand plants discovered by the French on that occasion, all mention of such is omitted under the full description of this one:—*Crescit in Nova Zeelandia*—is all that is said.

Another error occurs concerning it in the "Hand Book," which it may be well to notice. (*Amicus Plato, amicus Socrates, sed magis amica veritas.*) There it is said to have a "frond 1-2 inches high," which is further described as if possessing (several) "involucres." Baker, however, (*l. c.*) rightly describes its "frond as being $\frac{1}{2}$ – $\frac{3}{4}$ inches long," but "with several close-spreading distinctly-toothed *pinnæ* (?), the upper simple ligulate, the lower often forked;" and so Bentham (*l. c.*)—"frond $\frac{1}{4}$ – $\frac{1}{2}$ inch long, deeply divided into 5-8 simple or bifid segments," adding, however, "sori, usually one only to each frond,"—as if he had seen more.

Therefore, seeing there is such great disparity between those descriptions, as well as omission of some of its more peculiar specific characters (and as *H. minimum, vera*, is still unknown to me as a New Zealand fern, and wishing to direct the attention of collectors in the Southern Island to it), I will just give (in English) the main part of A. Richard's original description of it (the original type specimens) from his botanical work (*supra*):—

"Plant very small; root creeping; frond scarcely $\frac{1}{2}$ inch long, erect, solitary, stipitate, pinnatifid; colour lurid red; lowermost pair of segments greatly divided, obtuse, much serrated; segments folded lengthwise; involucre solitary, terminal, oblong, obtuse, semi-bivalve; margins of valves toothed (*dentatus*)."

And then the several drawings of his plant accompanying his description fully bear him out; for he has carefully given no less than five full-sized fronds, four of them singly arising from the same rhizome, and all remarkably alike, and quite symmetrical. And not only so, but from them we gain other important characters, each pinnatifid frond possessing five

pairs of involute segments, the lowermost pair being deeply and falcately cut nearly to the base, each of these forked segments being also deeply serrated on both sides, and having also a costa are very much recurved all the segments have sharply-serrated margins and apices, each having 6–8 teeth on its side and three at the apex, with the midrib extending through to the margin and terminating in the central tooth, while the involucre possesses very short, sharp, rigid teeth. The whole appearance, at first sight, strongly reminding one of a small spiny holly leaf (*Ilex aquifolium*).

HYMENOPHYLLUM SCABRUM var. nov. *HIRTUM*.

Rhizome long, creeping, stout, densely clothed with red shaggy fine hair; *stipe* stout, 3–3½ inch long, thickly hirsute, also the main rhachis, with light-coloured (scarcely reddish) flexuose hairs 2–3 lines, long, flattened, and finely and regularly jointed, 20–22 joints to 1 line; *frond* deltoid-ovate 5–6 in. long, 5–5½ in. broad near base, curved, pinnate below, elastic, and possessing a very similar strong odour to that of *H. sanguinolentum*; every secondary rhachis, costa vein, and veinlet thickly covered below with red adpressed hairs; *pinnæ* bi-pinnatifid, sub-opposite, falcate, thickly set on rhachis, overlapping; *segments* broader, larger, and more profuse than in *H. scabrum*, with their apices entire; *secondary rhachises*, *costæ*, and *veins* prominent; *involucres* broadly deltoid, finely and closely toothed, free to base, inflated, open, of a lighter coloured green than the frond. *Young fronds* and *stipes*, before unrolling, densely shaggy, with long light brown hairs.

The whole appearance of this fern is widely different from *H. scabrum* (*vera*), it is not only shorter—having a dwarfed form, and is much more shaggy, but it is more dense in its veneration, and much less rigid. Its colour, too, is a lighter green.

Hab.—On the ground in the “black birch” (*Fagus solandri*) forests, east spurs of the Ruahine range, where it grows pretty uniformly in thick beds, but is not often found bearing fruit.

I have long known this fern (indeed, Sir W. J. Hooker had some inferior first specimens of it, which I had sent him, when he compiled Vol. I. of his *Species Filicum* in 1846), and I have again of late—during the summers of 1879–1880—enjoyed myself among it in its native forests, and have diligently compared its living specimens with those of the larger and coarser variety, *H. scabrum*. And having also lately been studying *H. scabrum* (*vera*) of A. Richard (on seeing a plate of it with dissections in his “Botany Voyage de L’Astrolabe,” already mentioned under *H. pygmæum* (*supra*), and comparing therewith the modern descriptions of *H. scabrum*, as given by our more eminent English pteridologists, Sir W. J. Hooker, Sir Jos. Hooker, Mr. Baker, and Mr. J. Smith, in their various works on ferns), I have noticed how greatly this plant varies, not merely from the original

type specimen as first published by A. Richard, but also from what is recorded of it by our English botanists.

Therefore, I have concluded to bring it forward, and so make it known to botanists and also to collectors, for without doubt it would form a choice and elegant garden fern, provided the proper culture could be given it.

Dr. Hooker, in his "Handbook New Zealand Flora," says of *H. scabrum*: "Stipes and rhachis brisily, frond dark green, involucres orbiculate, etc.;" and Mr. Baker, in his *Synopsis Filicum*, where he has placed it in the section of Hymenophyllum, having "glabrous fronds," says of it: "Stipes and main rachis ciliated with long brown brisily hairs, involucres small," etc.; and in an additional remark mentions its "*hairy rhachis as forming a link between the glabrous and truly hirsute species*;" and Mr. J. Smith (who had often and that for a long period had the great advantage of seeing *H. scabrum* in a living state at Kew) places it, in his most recent work on ferns (*Historia Filicum*) in the section of Hymenophyllum, having their "fronds glabrous and stipes and rhachis *rarely pilose*." All this, however, does not agree with the characters of this very villous variety; and just so it is with the descriptions and botanical plate of *H. scabrum* by A. Richard (*supra*).

Its copious large-jointed hairs form such a striking object, even to the naked eye (while under a microscope they are most beautiful!), and together with its densely hirsute ribs, veins, and veinlets, extending all over the frond, and large light-green open involucral valves, give this variety a most striking appearance.

? PTERIS LOMARIOIDES.

Stipe (upper part only) 5 in. long, ? erect, straight, slender, naked, smooth, channelled above, straw coloured; *frond* 6½ in. long, 5 in. broad, symmetrical, broadly round cordate (in outline), pedate, smooth, glabrous, very membranaceous, semi-transparent, colour (dry) a light olive-green, pinnate, two pairs only, and one long terminal segment 5¼ in. long, 10 lines broad, petiolate, linear-lanceolate (together with pinnæ) decreasing but little and very gradually downwards, sub-accuminate acute; *pinnæ* opposite, linear-lanceolate oblique obtuse, the two pairs 1 in. apart on rhachis, upper pair sub-sessile and slightly decurrent on lower side, 3¾ in. long, 9 lines broad; lower pair petiolate and pedate, slightly decurrent on upper side 3½ in. long, and 8 lines broad, lowermost pedate segments 1¼ in. long, 6 lines broad, sub-sessile, dimidiate, and curved upwards, all four pinnæ inclined inwards and upwards; *veins* regular and parallel, conspicuous, fine, pretty close (about 2¼ to a line), free and simply forked with clavate apices terminating within the margin, which is slightly cartilaginous and crenulate, and closely and finely serrulate, particularly towards and at apices of pinnæ

and terminal segment; *midrib* finely channelled above, and very conspicuous on under-surface, slightly puckered, evanescent towards apices of *pinnæ*, very light straw coloured; *hairs* (*debris* of, remaining in *lacunæ* in axils and bases of *pinnæ*) bright red-brown. ? *Pteris lomarioides*, Muhl.

Hab.—In a wood close to the coach road near Tapuaeharuru, between Napier and Taupo.

This fern, of which (I regret to say) I possess only one barren specimen, has given me no little trouble. I obtained it in 1872, from an acquaintance who had travelled overland from Taupo to Napier, and who, on passing through a wooded spot on foot, had carelessly gathered it, and afterwards, on remounting the coach, had brought it on to Napier and gave it to me; he said its *habitat* was near Tapuaeharuru. It was quite perfect, save the lowermost part of its stipe, fresh, and in very good condition. I have subsequently, on several occasions, endeavoured to get more and better specimens, by writing to residents in that locality (even enclosing drawings), but have always failed. Until lately, I did hope to visit the locality and to seek it myself, but that hope has been some time abandoned, and therefore I now have made it known in hopes of some one finding it. Not being certain of its genus I have merely provisionally named it *Pteris lomarioides*, (from those two genera being so commonly and largely represented in New Zealand, and from its possessing the venation of the more simple species of *Pteris*, with a faint likeness in colour and form of *pinnæ* to some species of *Lomaria*), although it may turn out to be a *Gymnogramme*.

One great peculiarity of this fern is, that it does not remind one at first sight of any other of our New Zealand ferns; although each of its *pinnæ* in single outline and appearance slightly resembles those of some states of *Lomaria procera*, yet in habitat, texture, oblique form and venation, they widely differ, not to mention its sub-pedate figure. In analogy it seems near to some of the simpler species of *Pteris* (§ *Eupteris*), particularly *Pt. pellucida*, *stenophylla*, *dactylina*, and *cretica*; a plate of *Pt. cretica* in Beddome's ferns of South India (Pl. XXXIX., the smaller right-hand figure) has a tolerably good partial resemblance, still it differs materially. Besides, in all our living plants of *Pt. cretica* (which species is pretty largely cultivated here), there are no such fronds as this one represented by Beddome. Nevertheless *Pt. cretica* is a Polynesian fern, as it is said to have been found in Fiji and the Sandwich Islands. In its simple clavate venation this fern certainly has affinity with *Nephrolepis* (a simple species of that genus having been also found at the hot lakes in the interior, not very distant from the *habitat* of this fern), but it wants the cretaceous spots of that genus. In its venation, hair, texture, and general form, it also has affinity with some species of *Gymnogramme* (§ 1. *Eugymnogramme*), particularly with *G. javanica*, which

is also said to have been found in the Sandwich Islands. In fine, when hereafter discovered in fruit, I have little doubt of its belonging to one of those four mentioned genera—*Pteris*, *Lomaria*, *Nephrolepis* or *Gymnogramme*.

DOODIA SQUARROSA, n.s.

Caudex short, thick, oblique, sub-ascending; *roots* many, stout, long, black, and wiry, densely clothed with shaggy black shining patent hairs; *plant* of densely caespitose close, sub-erect, and squarrose habit, many fronds springing from one stock; *stipe* rather slender, 6–8 in. long, scabrous yet glossy, straight, and sub-flexuose, deeply channelled on upper-surface, clothed (especially below) with black chaffy acuminate hair-pointed scales, 3–3½ lines long and 1 line broad at base, striated and minutely reticulated, reticulations oblong, stipe sub-muricate in distant dots where the scales have fallen; *rhachis* slender, brittle, channelled throughout on upper surface, pale-coloured in the upper part, brownish in the lower, with scattered long brown tortuous weak and shrivelled scarious scales; *fronds* pale green, sub-membranaceous, glossy yet minutely roughish and harsh to feel, dry, sub-rugose and rigid; the very young circinate and undeveloped ones 2–3 in. high, clothed with long black subulate and pointed scales; *fertile fr.* lanceolate, very acuminate, 18–19 in. long, with a very long terminal segment; breadth (mid.) 4½–5½ in., pinnate, length of pinna (mid.) 2¼–2½ in., breadth 4 lines, margins of pinnæ and segments sinuous, cartilaginous, sharply and irregularly spinuloso-serrate with white sharp teeth; *costæ* deeply channelled above; *pinnae* opposite, 24–28 jugate, sub-falcate, linear, broadest at base, obtuse and truncate; 4–6 lowest pairs sub-petiolate, free, largely hastate, and largely auricled upwards, 10 lines long, 4–5 lines broad at base; upper pinnae sessile, free upwards and auricled, decurrent downwards; 3–4 pairs uppermost pinnae slightly pinnatifid; 5–8 pairs lowermost pinnae very distant, 1 inch apart on rhachis, with the distance between them gradually decreasing upwards; *terminal segment* very long, 4½–5 in. long, 3 lines broad, linear, strap-shaped, obtuse, sometimes sub-flexuose and sub-crenulated, not unfrequently auricled below and coadunate with adjoining segments, occasionally bifid at apex, each segment 8–14 lines long; *veins* as in the genus, but coarse and much produced; *sori* biserial, crowded yet not confluent (save through age in very old fronds), distant from costa, those in row nearest to costa longest, 1–2½ lines long, outer row shorter, often composed of mere dots, biserial on auricles and wings of pinnæ both upwards and downwards, sub-triserial on some long terminal segments, when fully ripe dark-brown and semi-confluent; *involucre* linear, narrow, pale-coloured, scarious, margin sub-erose, in outer row often sub-lunate and mere dots, but still the same kind of involucre; *barren frond* much as fertile, only

shorter and texture a little thinner; *pinnae* linear-oblong, broader, 3–4 lines broad, obtuse; *terminal segment* somewhat shorter and broader, 4–6 lines broad.

Some semi-barren fronds present a peculiar appearance; a few *pinnae* having single rows of scattered sori, in very small linear and semi-lunate dots, each scarcely one line long, which are again sometimes biserial and distant on the terminal segment, and on a few of the larger *pinnae*. If these peculiar fronds were not found growing from the same root or caudex with the larger and fertile ones, they would be set down as forming a different species or variety.

Six species of *Doodia* are very fully described by Sir W. J. Hooker in his *Species Filicum*, including those known to him from New Zealand; I possess botanical drawings with dissections of them all, with none of which as well as with their descriptions) does this plant agree. To our New Zealand "*D. caudata*," of which, though possessing copious specimens from several botanists, Sir W. J. Hooker says, "All these from New Zealand border too closely upon *D. media* (*Sp. Fil.*, Vol. III., p. 76); it approaches in its long terminal segment and narrow (fertile) *pinnae*; but that Australian species, though a very much smaller plant, is said to be "pinnate nearly to the summit," with the "sori in a single series," its "indusia sub-lunate, stipes naked at base," and "its rachis quite smooth," etc. It also has pretty close affinity with *D. media*, but differs still more from this common New Zealand species. In its regular double lines of closely-compacted sori, and in their great excess, extending both upwards and downwards on the auricles and wings of its broadly-adnate *pinnae* (as it were *sursum currens* and *decurrens*), which give a kind of winged appearance to the rhachis, though still truly pinnate, every pinna being separate, and also in its black paleaceous stipes and scales, it seems to have affinity with *D. dives*, a Ceylon species, especially with the variety β *zeylanicum*, Hook., of that species, of which Sir W. J. Hooker says,—"The wings of the rachis bear sori as well as the segments and *pinnae*" (*l.c.*, p. 74), but the involucres in the Ceylon plant are all lunulate and broader, and the *pinnae* and venation different. (A fine free drawing, with dissections of this plant, is given in *Beddome's Ferns of S. India*, p. 222, all showing its very great distinctness from the Napier plant.) It seems also to be equally distinct from five newer and additional Polynesian "varieties," briefly described by Baker in his *Synopsis Filicum* (appendix, p. 482), nearly all of which have their sori uni-serial.

I have given, I may say, some amount of extra examination at various times extending throughout many years, to this plant, having it here growing around me—as may be inferred from my full description of it; and

while I advance it as a distinct species, I do so with some hesitation, and mainly from the fact of its disagreeing in several important characters with those of the other described species of *Doodia*, not a few of which, I think, will hereafter prove, when examined and compared together in a living state (the only way of true comparison), to be but varieties. Sir W. J. Hooker truly enough said (though he only knew of those six species first mentioned above)—“All our species of the genus are singularly variable.” (*l. c.*, III. 75.) See, also, my remarks on the genus *Doodia*, in my preceding Paper “On the Ferns of Scinde Island (Napier).”

ART. L.—*Descriptions of new Plants.* By T. KIRK, F.L.S.

[Read before the Wellington Philosophical Society, 4th December, 1880.]

OLEARIA ANGULATA, n.s.

A MUCH-BRANCHED shrub, 8–12 feet high; branches grooved, short; leaves $1\frac{1}{2}$ – $2\frac{1}{2}$ " long, broadly elliptic, rounded at the apex, truncate at the base, waved at the margins, clothed with appressed white tomentum below, veins forming nearly a right-angle with the midrib; flowers in axillary panicles, peduncles equalling the leaves or longer, branches short, spreading, angled, pubescent, heads shortly pedicelled, involucreal scales linear-oblong, laxly imbricated, ciliated; florets 3–5, one or two with a broad ray, achenes strigose, pappus in two series.

Hab.—North Island, North Cape, Spirits Bay. In habit and foliage this species approaches *O. fosterii*, while it is closely allied to *O. albiflora* by the inflorescence. It appears to have been confused with *O. albiflora*, and has a still more restricted range than that species.

DRACOPHYLLUM PROSTRATUM, n.s.

A small prostrate species, stems 3"–12" long, with short branches; leaves $\frac{1}{8}$ – $\frac{1}{10}$ " long, ovate subulate, with a broad sheathing base, glabrous; flowers solitary, terminal, sepals ovate, obtuse, shorter than the corolla.

Hab.—South Island; mountains above Lake Harris, Otago, 4,000 feet, T. Kirk; Mount St. Bathans; and Stewart's Island, D. Petrie.

A variable plant in habit, although constant in its leaves and floral characters. The branches are never so densely crowded as in *D. muscoides* Hook.f., although Mr. Petrie's specimens approach that species in this particular. The Lake Harris specimens, owing to their exceptional habitat, creeping amongst sphagnum, were very lax and glaucous, but in other respects agree with those from Mount St. Bathans and Stewart Island.

SCHÆNUS MOOREI, n.s.

Tufted, leaves shorter than the culms, filiform, slender, grooved, with reddish brown sheaths. Culms 4"–6" high, slender, grooved; panicle soli-