

leaves are longer, narrower, and spreading, not appressed to the twig, but connate at the base.

Hab.—Near Dunedin.

60. *V. loganioides*, Armstrong, "New Zealand Country Journal," Vol. III. A small shrub, six inches high, decumbent and rooting at the joints. *Branches* hairy towards the tips. *Leaves* densely imbricated, appressed to the branch with spreading tips, ovate, acuminate, glabrous except the ciliated margins, usually entire, sometimes with 1–3 small teeth on each side, $\frac{1}{2}$ inch long, sessile, very sharply keeled below. *Flowers* in short few-flowered racemes in pairs near the points of the branches. *Peduncles* hairy, short. *Bracts* $\frac{1}{8}$ inch long, ovate, acuminate. *Pedicels* hairy. *Calyx-lobes* lanceolate, acute, keeled, ciliated. *Corolla* white with pink stripes, very fugaceous; *tube* $\frac{1}{12}$ inch long; *lobes* broadly ovate, obtuse; *limb* $\frac{1}{3}$ inch across. *Stamens* as long as the style. *Anthers* brown. *Capsule* not seen.

Hab.—Rangitata valley, Mr. J. F. Armstrong. Clyde valley, Mr. W. Gray, 5,000–6,000 feet.

A most singular plant, quite different in appearance from any other known *Veronica*. Until the fruit is obtained the position and relationship cannot be determined. The corolla seems to approach that of *V. linifolia*, but the aspect of the plant is more that of *V. tetragona*, though the leaves are not connate at their bases.

ART. XLVI.—*A natural Arrangement of the New Zealand Ferns founded on the System of Smith's "Historia Filicum," with critical Notes on certain Species.* By J. B. ARMSTRONG.

[Read before the Philosophical Institute of Canterbury, 2nd September, 1880.]

[Extract.]

CRITICAL NOTES.

Gymnogramma rutafolia, Br. *G. alpina*, Potts, is certainly referable to this species. Specimens collected on the Upper Rangitata and kindly given to me by Mr. Potts, do not present any characters differing from those of *G. rutafolia* sent from other parts of the colony. I have it from several localities in Canterbury and Otago, but have seen no North Island specimens. The New Zealand plant is, however, quite distinct from *G. pozoii* with which it was united in the "Syn. Filicum."

Lastrea invisula. The *Nephrodium thelypteris* var. *squamulosum* of the "Hand-book" is undoubtedly the *Aspidium invisum* of Forster, and the specific

name must therefore be changed as I have no doubt whatever as to its distinctness from the British plant. It has not, so far as I am aware, been found in the Southern Provinces.

Cystopteris novæ-zealandiæ. This plant is certainly distinct from *C. fragilis*, Bernhardt, to which it has been referred by most authors. The plant is always much smaller and more fragile with an erect underground miniature branching caudex, and is always less divided than the European plant. The indusium is often entirely absent from Canterbury specimens, and nearly always becomes obsolete with age. I have examined large numbers of British specimens together with living plants of the true *C. fragilis*, Bernhardt, and have found none approaching this. Some states of it, however, are much like *C. dentata* in aspect, but differ much in the rhizome and sori. The description in the "Handbook," copied from the "Species Filicum," was drawn up from European specimens, and does not apply to the New Zealand plant. It is found from near the sea-level (close to Christchurch) up to 4,800 feet or higher, but presents scarcely any variations, thus offering another point of difference from the British plant, which is exceedingly variable if I may judge from the numerous specimens in my own herbarium.

Dicksonia fibrosa. I am glad to find that Mr. Baker is disposed to admit this old species of Colenso's. We have cultivated the Tasmanian *D. antarctica*, and this for many years, and I have no hesitation in pronouncing them distinct if examined in the living state, as all ferns ought to be before any opinion is given as to their distinctness.

D. antarctica is the fastest growing tree-fern we have as yet experimented with. Plants only seven and a half years old from spores have made trunks varying from 3 to 10 inches high and 3 to 4 inches through. It is therefore likely that the rapidity of growth of tree-fern stems has been very much under-estimated by most writers on ferns.

Cheilanthes kirkii. An examination of cultivated plants of the true *C. tenuifolia*, Swzs., has convinced me of the distinctness of the New Zealand plant referred to that species by Mr. Kirk.* In my Sketch of the Flora of Canterbury† I considered this to be a variety of *C. sieberi*; but on further consideration I am disposed to acknowledge it as a distinct species and to attach to it the name of Mr. T. Kirk, who has done so much to increase our knowledge of New Zealand plants. Very good descriptions of this and *C. sieberi* will be found in the volume of the "Transactions" referred to above. *C. kirkii* is rather a common plant in Canterbury, but appears to be somewhat rare in the North.

* "Trans. N.Z. Inst.," Vol. VI., p. 247.

† "Trans. N.Z. Inst.," Vol. XII., pp. 325-353.

Asplenium, sp. Probably another species of this genus, found in the lower Canterbury Alps, will yet be added to our list of New Zealand ferns, and admitted to specific distinction. It is intermediate in appearance between *A. flaccidum* and *A. hookerianum*, and frequently produces dense masses of sori covering the whole under-surface of the frond. It has been erroneously referred to *A. richardi* by collectors of living ferns.

Hymenophyllum. The great increase in the number of species of this genus is noteworthy. In the "Handbook" only fifteen species are given, whilst I here acknowledge twenty-six, and I am by no means sure but that I ought properly to have admitted several more. This is undoubtedly the most difficult New Zealand genus of ferns, and requires to be carefully studied in the living state. I think that most of the species here given will be generally admitted in the future, seeing that most of the New Zealand species suppressed in the first edition of the "Synopsis" have been re-admitted in the second. Probably also several new ones remain to be discovered. It will be seen that I have restored Mr. Colenso's old species *H. revolutum*, which I consider quite as worthy of specific standing as *H. unilaterale*, *H. montanum*, and others. *H. cheesemanii* is closely allied to *H. minimum*, but differs in the ciliated margins and costa. It is the least satisfactory of all the species adopted here.

H. armstrongii is also allied to *H. minimum*, but differs essentially in the remarkable border, and in the columnar receptacle being frequently exerted, which led Mr. Baker to place it in the genus *Trichomanes* (see Synopsis Filicum, first edition in appendix). It is, however, more naturally allied in habit to *Hymenophyllum*, and was first referred to this genus by Sir. J. D. Hooker on its discovery in 1867.

Of Mr. Colenso's *H. erecto-elatum* I have not yet seen specimens, but he is such a careful observer, and is so well up in New Zealand plants, that I have little reason to doubt its distinctness. The same author's *H. pusillum* is certainly very near to *H. tunbridgense*, but I accept it for the present. I have placed *H. lyallii* in this genus, although it was referred to *Trichomanes* in the "Synopsis," because it appears to me to have more of the habit of *Hymenophyllum* than of *Trichomanes*; but it cannot be denied that the New Zealand species of the two genera present a graduated series of forms, and the limits of these two genera are anything but clearly defined. Still, it is convenient to keep up both generic names, and I think it will be found best to refer those species with long, distinctly-exserted, columnar receptacles and densert issue to *Trichomanes*, and the remainder to *Hymenophyllum*. *H. malingii* is a difficult plant to place, but apparently it comes nearest *H. æruginosum*.

Trichomanes venustum. This new species of Mr. Colenso's is, I believe, not uncommon in the south, but has hitherto been confounded with *T. venosum*.

Osmunda. I have here departed somewhat from Smith's arrangement, and united *Todea* with *Osmunda* of Linnæus. This genus has given me more trouble than any other, and consequently I do not expect New Zealand pteridologists to agree with my views at once, but I have little doubt that many of them will do so when they have studied the question as much as I have done. There is really no natural character to separate the typical species of *Todea* from *Osmunda*. The character usually given is that the fronds of *Osmunda* are contracted in fruit, but the fronds of *Todea* are often partially contracted, though never so much as those of *Osmunda regalis*. Consequently this character is of no value, as we cannot distinguish genera by the amount of contraction of their fertile fronds. In the variation, texture, and in the sori and venation, we find no difference beyond what is sufficient to distinguish them as species of one genus. In the case of the two species of the sub-genus *Leptopteris*, however, we find characters of more importance, such as the membranous texture of the fronds and the scattered sori; but these characters are not now considered by authors to be of sufficient importance for defining genera, or even for separating *Leptopteris* from typical *Todea*, and therefore I feel justified in placing all three plants in *Osmunda*. I find that Sir J. D. Hooker has, in the "Handbook," given an opinion that *Todea* should merge into *Osmunda*, thus anticipating my action.

In conclusion, it is necessary to remark that I have made a very free use of Smith's generic descriptions;* but I do not suppose that the author would object, as his descriptions are so admirably drawn that it would be quite impossible for me to improve upon them, and I shall conclude with a hope that this paper will be the means of bringing before the New Zealand student the least difficult and most natural system of fern classification ever presented to the public.

ARRANGEMENT OF GENERA AND SPECIES.

FILICES.

Division I.—*Eremobrya*.

Tribe I.—*Polypodeæ*.

Gen. I.—*Niphobolus*, Kaulfuss.

1. *N. serpens* (Fst.), J. Sm. *Polypodium rupestre*, Hk.

Gen. II.—*Phymatodes*, Presl.

1. *P. pustulata* (Fst.), Presl.; slender.
2. *P. billardieri*, Br.; stout, glaucous.

* All descriptions omitted, the subject of the paper being "arrangement."—ED.

3. *P. cheesemanii*, Baker.

4. *P.*, sps. (Westland) ; sori not seen.

Gen. III.—*Dictymia*, *J. Smith*.

1. *D. lanceolata*, *J. Sm.* *Polypodium cunninghami*, *Hk.*

Division II.—**Desmobrya.**

Tribe II.—*Acrasticheæ*.

Gen. IV.—*Lomariopsis*, *Fee*.

1. *L. heteromorpha*, *J. Sm.* *Lomaria filiformis*, *A. Cunn.*

Tribe III.—*Hemionitideæ*.

Gen. V.—*Gymnogramma*.

1. *G. leptophylla*, *Des.*

2. *G. rutæfolia*, *Hk.*

G. alpina *Potts*. NOTE.—In the *Synopsis Filicum* this is wrongly united with the South European *G. Pozai*. It is confined to Australia and New Zealand.

Gen. VI.—*Platyloma*, *J. Smith*.

1. *P. rotundifolia* (*Fst.*)

2. *P. falcata*, (*Br.*)

Tribe IV.—*Pleurogrammeæ*.

Gen. VII.—*Grammitis*, *Swartz*.

1. *G. australis*, *Br.* *Polypodium australe*, *Hk.*

2. *G. Pumila*, *Armstrong*.

Tribe V.—*Ctenopterideæ*.

Gen. VIII.—*Ctenopteris*, *Blume*.

1. *C. grammitidis* (*Br.*)

Tribe VI.—*Phegopterideæ*.

Gen. IX.—*Goniopteris*, *Presl*.

1. *G. pennigera*, *Presl*.

Gen. X.—*Nephrodium*, *Schott*.

1. *N. molle*, *Br.*

2. *N. unitum*, *Hk.*

Gen. XI.—*Lastrea*, *Presl*.

1. *L. glabella* (*Cunn.*)

2. *L. decomposita* (*Br.*)

3. *L. velutina* (*A. Rich.*)

4. *L. hispida*, *Swartz*.

5. *L. invisæ* (*Forst.*) *Nephrodium Thelypteris*. var., *Hk.f.*

Gen. XII.—*Polystichum*, *Schott*.

1. *P. vestitum*, (*Swartz*).

2. *P. richardi* (*Hk.*)

3. *P. oculatum* (Hk.)
4. *P. cystostigium* (Hk.)
Gen. XIII.—*Arthropteris*, J. Sm.
1. *A. tenella*, J. Sm. *Polypodium tenellum*, Hk.f.
Gen. XIV.—*Nephrolepis*, Schott.
1. *N. tuberosa*, Schott.
Gen. XV.—*Hypolepis*, *Bernhardi*.
1. *H. tenuifolia*, Bern.
2. *H. distans*, Hk.
3. *H. millefolium*, Hk.f.
4. *H. rugulosum* (Lab.)
Tribe VII.—*Physemateæ*.
Gen. XVI.—*Cystopteris*, *Bernhardi*.
1. *C. novæ-zealandiæ*, Armstrong. *C. fragilis* of authors non *Bernhardi*.
Tribe VIII.—*Cyathea*.
Gen. XVII.—*Cyathea*, *Smith*.
1. *C. cunninghamii*, Heward.
2. *C. dealbata*, Swartz.
3. *C. medullaris*, Swartz.
4. *C. polyneuron*, Colenso.
5. *C. smithii*, Hk.f.
Gen. XVIII.—*Alsophila*, *Br*.
1. *A. colensoi*, Hk.f.
Tribe IX.—*Dicksoniæ*.
Gen. XIX.—*Dicksonia*, *L. Héritier*.
1. *D. squarrosa*, Swartz.
2. *D. fibrosa*, Colenso.
3. *D. lanata*, Colenso.
4. *D. sparmaniana*, Colenso.
Tribe X.—*Saccolomeæ*.
Gen. XX.—*Microlepis*, *Presl*.
1. *M. novæ-zealandiæ*, Col.
2. *M. (?) forsteri*, Carr.
Gen. XXI.—*Loxoma*, *Br*.
1. *L. cunninghamii*, *Br*.
Tribe XI.—*Lindsayæ*.
Gen. XXII.—*Lindsæa*, *Dryander*.
1. *L. trichomanoides*, *Dry*.
2. *L. lessoni*, *Bory*.
3. *L. viridis*, Col.
4. *L. linearis*, Swartz.

Tribe XII. *Adiantea*.

Gen. XXIII.—*Adiantum*, Linn.

1. *A. hispidulum*, Swartz.
2. *A. setulosum*, J. Sm.
3. *A. assimile*, Swartz.
4. *A. formosum*, Br.
5. *A. affine*, Willd.
6. *A. fulvum*, Raoul.

Tribe XIII.—*Cheilanthea*.

Gen. XXIV.—*Nothochlæna*, Br.

1. *N. distans*, Br.

Gen. XXV.—*Cheilanthes*, Swartz.

1. *C. sieberi*, Kunze.
2. *C. kirkii*, Armstrong. *C. tenuifolia*, Kirk non Swartz. *C. sieberi*, var. *deltoidæ*, Armstrong.

Tribe XIV.—*Pteridæ*.

Gen. XXVI.—*Litobrochia*, Presl.

1. *L. comans* (Fst.).
2. *L. macilenta* (A. Rich.).

Gen. XXVII.—*Histiopteris*, Agardh.

1. *H. incisa*, Thun.

Gen. XXVIII.—*Pteris*, Linn.

1. *P. tremula*, Br.

Gen. XXIX.—*Ornithopteris*, Agardh.

1. *O. esculenta* (Fst.)
2. *O. scaberula* (Rich.)

Tribe XV.—*Blechnæ*.

Gen. XXX.—*Lomaria*, Willd.

1. *L. elongata*, Blume.
2. *L. alpina*, Spreng.
3. *L. banksii*, Hk.f
4. *L. pumila*, Raoul.
5. *L. nigra*, Colenso.
6. *L. discolor*, Willd.
7. *L. lanceolata*, Spreng.
8. *L. rigida* (J. Sm.), *L. dura*, Moore.
9. *L. membranacea*, Col.
10. *L. rotundifolia*, Raoul. *L. fluviatilis*, Hk.f., non Spreng.
11. *L. vulcanica*, R. Br.
12. *L. noma*, Colenso.
13. *L. minor*, Spreng.

14. *L. procera*, Spreng

15. *L. duplicata*, Potts.

16. *L. fraseri*, Cunn.

Gen. XXXI.—*Doodia*, Br.

1. *D. caudata*, Br.

2. *D. media*, Br.

Tribe XVI.—*Aspleneæ*.

Gen. XXXII.—*Asplenium*, Linn.

* *Lucidum* group.

1. *A. lucidum*, Fst.

2. *A. obtusatum*, Fst.

3. *A. obliquum*, Fst.

4. *A. soleraprium*, Hombrau.

** *Trichomanes* group.

5. *A. trichomanes*, Linn.

*** *Rhizophorum* group.

6. *A. flabellifolium*, Cav.

**** *Flaccidum* group.

7. *A. bulbiferum*, Fst.

8. *A. appendiculatum*, Lab.

9. *A. flaccidum*, Fst.

10. *A. colensoi*, Moore.

11. *A. richardi*, Hk.f.

12. *A. Hookerianum*, Col.

***** *Falcatum* group.

13. *A. falcatum*, Lamarek.

Gen. XXXIII.—*Athyrium*, Roth.

1. *A. brownii*, J. Sm. *Asplenium umbrasum*, Baker. Syn. Fil.

Tribe XVII.—*Gleichenææ*.

Gen. XXXIV.—*Gleichenia*, Smith.

1. *G. semi-vestita*, R. Br.

2. *G. hecistophylla*, A. Cunn.

3. *G. dicarpa*, R. Br.

4. *G. alpina*, R. Br.

5. *G. cunninghamii*, Heward.

6. *G. flabellata*, R. Br.

7. *G. dichotoma*, Hk.

Tribe XVIII.—*Hymenophylleæ*,

Gen. XXXV.—*Hymenophyllum*, Sm.

1. *H. polyanthas*, Swartz.

2. *H. narum*, Br.

3. *H. nitens*, Br.

4. *H. demmisum*, Swartz.
5. *H. scabrum*, A. Rich.
6. *H. crispatum*, Wallich.
7. *H. pulcherrimum*, Col.
8. *H. erecto-elatum*, Col.
9. *H. dilatatum*, Swartz.
10. *H. villosum*, Colenso.
11. *H. montanum*, Kirk.
12. *H. tunbridgense*, Sm.
13. *H. unilaterale*, Willd.
14. *H. revolutum*, Col.
15. *H. pusillum*, Col.
16. *H. ciliatum*, Swartz.
17. *H. multifidum*, Swartz.
18. *H. bivalve*, Swartz.
19. *H. æruginosum*, Carm.
20. *H. minimum*, Rich.
21. *H. cheesmanii*, Hk.f.
22. *H. armstrongii*, Hk.f.
23. *H. lyalli*, Hk.f.
24. *H. rufescens*, Kirk.
25. *H. malingii*, Hk.f.
26. *H. sps.* Aff. *H. æruginosum*.

Gen. XXXVI.—Trichomanes. Linn.

1. *T. reniforme*, Fst.
2. *T. humile*, Fst.
3. *T. venustulum*, Colenso.
4. *T. venasum*, Br.
5. *T. strictum*, Menzies.
6. *T. elongatum*, Cunn.
7. *T. colensoi*, Hk.f.

Tribe XIX.—Schizææ.

Gen. XXXVII.—Lygodium, Swartz.

1. *L. articulatum*, Rich.

Gen. XXXVIII.—Schizææ, Smith.

1. *S. dichotoma*, Swartz.
2. *S. bifida*, Lab.
3. *S. fistulosa*, Swartz.

Tribe XX.—Osmundææ.

Gen. XXXIX.—Osmunda, Linn.

1. *O. barbara*, Moore.

Sub-genus *Leptopteris*.

2. *O. hymenophylloides*, Presl.
3. *O. superba*, Colenso.

Division III.—*Scaphiobrya*.

Tribe XXI.—*Marattiaceæ*.

Gen. XL.—*Marattia*, Smith.

1. *M. fraxinea*, Smith.

Tribe XXII.—*Ophioglosseæ*.

Gen. XLI.—*Ophioglossum*, Linn.

1. *O. costatum*, Br.
2. *O. gramineum*, Willd.
3. *O. lusitanicum*, Linn. (?)
4. *O. minimum*, Armstrong.

Gen. XLII.—*Botrychium*.

1. *B. dissectum*, Muhlenberg.
2. *B. cicutarium*, Swartz.

NOTE.—Doubtful genus *Deunstaedia*, Bern.

sps. *D. Dubia*, J. Sm.

Dicksonia dubia of many authors. *Davallia dubia* of gardens and some New Zealand herbaria. Barren fronds of a fern referred to this have often been obtained in Canterbury and Otago, but I have not been able to obtain any native specimens in fruit, and perhaps the plant may turn out to be *Microlepia forsteri*. Many other ferns are said to grow in New Zealand, but their occurrence requires authentication.

ART. XLVII.—*Description of a new species of Metzgeria; also a brief notice of the finding of Bæoniyses heteromorphus*, Nyl., in New Zealand.

By W. COLENZO, F.L.S.

[Read before the Hawkes' Bay Philosophical Institute, 12th July, 1880.]

Metzgeria (Symphyogyna) *rugulosa*, n.s.

Plant terrestrial, sub-erect, of close half imbricate growth, forming little beds; *root* creeping, densely tomentose, colour light brown; *stipe* 2–3 in. long, sub-flexuose, whitish, translucent, semi-succulent, two-nerved downwards from the fork (four-nerved above), nerves very distinct; *frond* darkish green, very membranaceous, drooping outwardly, flabellate and kidney-shaped in outline, 10–12 lines broad, 5–7 lines long, forked, symmetrical, each main division trichotomously divided and two-nerved, semi-rugulose on upper surface glabrous; *segments* linear, 2–3 lines long, 1 line broad,