EXPLANATION OF PLATES XXV.–XXVIII.

PLATE XXV.

Phascum austro-crispum.

Fig. 1, 2, Two leaves, × 32.
" 3. Perichætial leaf, × 32.
" 4. Cells at base of leaf, × 270.
" 5. Cells of leaf, × 270.
Fig. 6. Capsule and seta, × 32.
" 7. Calyptra, × 32.
" 8. Special branch bearing male infl., × 32.

PLATE XXVI.

Braunia novæ-seelandiæ.

Fig. 1. Plant, nat. size.
" 2. Leaf, × 32.
" 3. Section of leaf, × 32.
" 4. Leaf of stolon, × 32.
" 5, 6. Perichætial, × 32.
Fig. 7. Apex of leaf, × 270.
" 8. Marginal cells, × 270.
" 9. Cells at middle of leaf at base, × 270.
" 10. Leaf-cells, × 270.

PLATE XXVII.

Hypnum micro-vagum.

Fig. 1. Leaf, × 32.
" 2. Leaf, × 70.
" 3. Apex of leaf, × 270.
" 4. Base of leaf, × 270.
" 5. Marginal cells, × 270.
" 6. Leaf-cells, × 270.
Fig. 7. Papillæ at back of leaf, × 270.
" 8. Capsule, × 32.
" 9. Endostome, × 270.
" 10. Leaf, × 32, and cells, × 270, of *Hypnum vagum.*

PLATE XXVIII.

Daltonia straminea.

Fig. 1. Plant, nat. size.
" 2. Leaf, × 32.
" 3. Apex of leaf, × 32.
" 4. Revolute margin and cells, × 270.
" 5. Capsule, × 32.
" 6. Calyptra, × 32.
Fig. 7. Operculum, × 32.
" 8. Peristome and endostome, × 70.
" 9. Male inflorescence, × 32.
" 10. Antheridia, × 70.
" 11. Cells of capsule, × 270.

ART. XXVII.—*On some little-known New Zealand Mosses.*

By T. W. NAYLOR BECKETT, F.L.S.

[*Read before the Philosophical Institute of Canterbury, 4th October, 1893.*]

Plates XXIX.–XXXc.

IN the following paper I continue my notes on little-known New Zealand mosses, and give descriptions, gleaned from various sources, of fourteen species which have not hitherto been recorded as belonging to our moss-flora. Through the kindness of Messrs. Wesley and Son, scientific publishers, London, I have obtained MSS. copies of the descriptions of Dr. Müller's and Dr. Hampe's mosses published at various times in the pages of "Linnæa" and the "Botanische Zeitung"—works which are not to be found in any of our libraries.

Professor V. F. Brotherus, of Helsingfors, has described many new Australian mosses in "Ofversigt af Finska Vet. Soc.

Forh." I am indebted to him for copies of his papers, in which I found two of our undescribed mosses. Authentic specimens of the mosses from their discoverer, Mr. Weymouth, of Hobart, enabled me with certainty to determine them.

Pleuridium gracilentum, Mitten.

"Monoicum, habitu *P. alternifolii*, gracile, foliis inferioribus e basi ovali subulato-lanceolato-acuminatis, nervo subulam superiorem totam occupante, margine ad basin partis subulatæ indistincte crenulato vel lævi, cellulis inferioribus oblongis parallelogrammaticis superioribus minoribus, perichætialibus thecam non tegentibus, patulis anguste ellipticis subulato longe attenuatis canaliculatis apice parce denticulatis integerrimisve laxe areolatis, theca in pedunculo brevi subglobosa leptodermi, operculo brevissimo, calyptra cucullata ad thecæ mediam descendente. *Hab.* Tasmania and King George's Sound. Excepting that the perichætial leaves are less straight and bristly, in general appearance scarcely different from *P. alternifolium*, but its leaves are of a different form."—W. Mitten, in Lin. Soc. Proc., iv., p. 65.

Phascum gracilentum, Hook., Fl. Tasm., ii., 164, T. 171, f. 3. *Astomum gracilentum*, C. Müll.

Hab. Growing amongst *Acaulon apiculatum* on clay-banks, Dyer's Pass, Lyttelton Hills; August, 1892; No. 88; *T. W. N. B.* (Identified by Dr. K. Müller.)

Dicranum sub-pungens, Hampe.

"Dense cæspitosum, subbiunciale, flavo-viride rufescens; caulis strictiusculus attenuatus, parce diviso-ramosus, subfastigatus, basi fuscescente tomentosus, apico comoso-falcatus, nitidus; folia convoluta, e basi vaginante latiore lanceolato-subulata, undique erecto-patentia, superiora longiora, parum falcata, apice dense serrulata, nervo tenui obscuro percurso; perichætialia convoluta emersa; seta brevis (semi-uncialis) erecta; theca adscendens curvato-cylindrica, evidenter strumosa, lævis, sub ore constricta, operculo elongato-conico-subulato thecam fere superante, dentibus peristomii parum conniventibus, ferrugineis, usque ad medium bifidis. *Hab.* In Mont. Grampian, William et Victoria Ranges. *Obs. Dicrano pungenti* simile, theca breviore strumosa satis differt." —"Muscorum frondosorum Floræ Australasiæ auctore Dr. Ferd. Müller," "Linnæa," xxx., 1859–60, p. 629.

Flagstaff Hill, Dunedin; *W. Bell;* No. 379a (identified by Dr. K. Müller). Auckland; *T. Kirk.*

Mitten, in his "Catalogue of Australian Mosses," p. 5, gives this as a synonym of *Dicranum pungens*, H. f. and W. ("Flora Antarctica," i., 129, t. 59, f. 1.), a plant found in the Lord Auckland and Campbell Islands.

Our New Zealand moss is a very handsome species, with stems 5in. to 7in. long, growing in dense masses at the base of trees.

Dicranum leucolomoides, C. Müll.

"Dioicum?; cæspites subelati laxe cohærentes, pallide lutescentes; caulis ascendens elatus subflaccidus flexuosus, ramis longiusculis subrecurvo-flexuosis, apice secundis divisus, inferne tenuis parce foliosus vel radiculosus; folia caulina laxe conferta subsecunda, pallide lutescentia, e basi late oblonga, cellulis alaribus creberrimis laxe parenchymaticis intense fuscis, dein marcescentibus albidis teneris, planis reticulata sensim longiuscule acuminata, apice denticulata, marginibus erectis vel apice conniventibus inferne tenuissime flavide marginatis, nervo tenui excurrente apice dorso denticulato, cellulis ubique valde incrassatis elongatis, parietibus haud conspicuis præditis; perich. in cylindrum exsertum congesta longe convolutacea lata, apice rotundata et acumine brevi stricto terminata, subintegerrima, enervia, basi laxius reticulata; theca in ped. terminali vel ob innovationem novam laterali breviusculo læve rubro recto suberecta, e collo brevi angusto strumoso cernuo-oblonga, breviuscula, operc. conico oblique subulato breviori, annulo nullo, calyptra robusta straminea; perist. d. densissimi robustissimi longi, inferne grosse cellulosi, rubri, in crura duo vel plerumque tria robusta apice hyalina subrugulosa, apice tantum libera ad basin usque divisi. *Patria,* Nova Seelandia, ad truncos arborum et rupes humidas sylvarum prope portum Kaipara: Coll. No. 715. A *D. scoparioo* gracillitate majore notisque illustratis longe differt. Ob marginem pallidum *Leucolomati* simile, sed diversum cellulis ubique elongatis."—C. Müller in "Botanische Zeitung," 1851, p. 549.

Hab. In large patches on the ground in *Fagus* forests, Kowai, Mount Torlesse; No. 165b (identified by Dr. Müller). Rough Gully, Bealey River; *T. W. N. B.*

Mitten, in his "Australian Mosses," p. 4, gives *D. leucolomoides,* C.M., as a synonym of *D. dicarpum.*

Dicranum angustinerve, Mitten.

"Dioicum, *D. billardieri* simile, caulibus brevibus ramosis, foliis patentibus subsecundis e basi subovali elongata sensim angustatis, nervo angusto percurrente dorso marginibusque apicem versus serrulatis, cellulis elongatis angustis alaribus oblongis quadratisque flavide fuscis in massam quadratam utrinque dispositis, perichætialibus convolutis internis vaginantibus subito in acumen breve setiforme angustatis, theca in pedunculo breviusculo semiunciali arcuata inclinata basi strumosa, peristomio dentibus rubris dicranis.

"*Hab.* Tasmania, on dead wood. Nearly allied to *D. billardieri*, but with somewhat the aspect of *D. reflexum*. It differs from *D. billardieri* in the form of the wider portion of its leaves being more elongate, and the narrow upper part being shorter; the internal perichætial leaves are also furnished with a bristle-like point, which seems wanting in *D. billardieri*."—Mitten, in Proc. Lin. Soc., iv., p. 68.

I am indebted to Mr. T. Kirk for specimens of this moss from Great Barrier Island (No. 46), which were identified by Mr. Mitten.

Campylopus bicolor, Hornsch. (In Musc. Siber. No. 9—Dicranum). Flora N.Z., ii., 69. Plate XXIX.

The cells of the leaf are oval, distinct, and disposed in very regular lines at an angle of 30° to the nerve. The laminæ of the leaf at the base are narrow and membranaceous and hyaline, and there are no inflated alar cells. The nerve is thin and conspicuous, occupying the greater part of the leaf; lamina 0·006in. broad; nerve 0·018in. This moss, in colour and the blunt cymbiform foliage, greatly resembles *C. kirkii*, but the leaves are smaller and the lamina much narrower than the nerve. The comal leaves do not form large heads. The fruit is unknown in New Zealand, but Müller describes it as slightly immersed and the operculum as having a curved beak.

Hab. Great Barrier Island; *T. Kirk.*

I am indebted to Mr. Kirk for authentic specimens of this and the following species identified by Mr. Mitten. I have lately received from Mr. W. A. Weymouth very fine specimens of this moss from Port Arthur, Tasmania, which were identified by Professor V. F. Brotherus.

Campylopus kirkii, Mitten. Plate XXX.

Stems 3in. to 4in. long, upper leaves yellowish-green, lower dark-brown, comal leaves in a round congested head, larger, broadly ovate-lanceolate, quite entire, cymbiform, apex blunt and concave. Stem leaves smaller, erect and appressed, lanceolate, obtuse, apex concave. Nerve thin, continued to the apex about one-fifth the width of the leaf, the lamellæ from the middle upwards branching off into the leaf. Lamina of leaf 0·019in. broad, nerve 0·008in. Cells of lower part of nerve long, narrow, rectangular, well defined; alar cells large, inflated, bladdery, when young hyaline, but at maturity chestnut-brown; the wings above transparent and very thin; cells of leaf roundish. Perichætial leaves, 4 inner ones long, convolute, towards the apex tapering to a narrow point, 12 outer ones gradually decreasing in size, lower part broad and vaginant, contracted suddenly into a ligulate point, all nerved to apex. Seta cygneous, 5 lines long. Capsule pachyder-

mous, mouth small, oval, gradually tapering into the seta, where it is slightly verrucose. Calyptra with a fringe about a quarter its length. Operculum conic, tapering evenly to a point. Peristome long, erect, teeth cleft to the middle, the undivided portion chestnut-brown, strongly trabeculate, legs long, slender, hyaline.

Hab. Golden Bay; No. 111; *Dr. L. Boor.* Great Barrier Island; *T. Kirk.* Named by Mr. Mitten.

Mr. Kirk informs me that he has also collected this moss on Stewart Island.

This beautiful moss differs from its near congener *C. bicolor* in its narrower nerve, in the presence of large inflated alar cells, and in the much more obscure leaf-cells. The seta is longer, and carries the capsule well above the comal leaves.

Dicnemon obsoletinerve, Hp. and C.M. Dicranum fasciatum, Hook., Fl. N.Z., ii., 66 (not Hedwig). Plate XXXA.

"Caulis humilis decumbens parce divisus laxissime-foliosus flaccidus; folia caulina patentissima longissima subsecunda latiuscule lanceolata longissime acuminata spiraliter torta valde concava, nerva ubique obsoleto angustissime pallescente excurrente, margine albescente erecto apice serrato, cellulis alaribus magis laxis aureis parenchymaticis, cæteris elongatis angustis laxis lævissimis; perichætialia in cylindrum exsertum congesta vaginantia; theca in pedicello brevi rubente lævi latere perichætii breviter emersa substrumosa oblonga cernua; dentes peristomii purpurei vix ad medium bifidi. Operculum et calyptra desunt. *Patria,* Nova Seelandia. Ex analogia ad *Dicnemon* revocavimus. Habitus perfecte dicranoideus; calyptra desiderata!"—"Linnæa," 1853, p. 496.

The seta are very generally twin. The operculum has a long, slender, and slightly-curved beak; the calyptra is cucullate and rough at the apex.

Hab. On tree-ferns, Fisher's Bush, Oxford; No. 19 (identified by Dr. Müller). Waimate Bush and Peel Forest, also on the stems of tree-ferns; *T. W. N. B.* Petane, Hawke's Bay; *A. Hamilton.* Stewart Island; *W. Bell.*

Obs. Hooker had doubts about the identity of this plant with Hedwig's *Dicranum fasciatum,* and observes, in Flora of N.Z., ii., p. 66, "If the specimens are rightly named, Hedwig's figure and description are very inaccurate"; and in a note in Handbook (p. 412) states, "The figure of Hedwig is indifferent, and Wilson thinks that it may indicate a different species."

Orthotrichum lateciliatum, Venturi, n. sp.

"Cæspituli tumescentes, caules erecti, 2cm. alti. Folia

siccitate curvata et laxe crispata, humiditate erecto-patentia ex ovata basi longe lanceolata, carinata, 3·33mm. longa, apice plus minusve acuminata, margine ad apicem usque recurvo, nervo in apice soluto. Areolatio superne rotundato-hexagona, parietibus haud incrassatis, papillis prominentibus, simplicibus vel bifurcatis ornata; inferne cellulæ elongatæ, angustæ, cum parietibus haud incrassatis basin conficiunt. Folia perichætii intima minora, margine plana. Inflorescentia monoica, lateralis; gemmulæ masculæ parvulæ, antheridia pauca, ovato-oblonga, pedicellata, eparaphysata. Vaginula cylindracea, parce pilosa, ochrea distincta pedicello adhærens. Pedicellus emergens, 3·20mm. longius siccitate torquescens. Capsula cum collo brevi, cito defluente ovato-cylindrica, 1·75mm. longa. Striæ ad medium sporangii productæ, e 4–5 seriebus cellularum latiorum compositæ, siccitate prominentes et capsulam ad medium usque sulcatam efficientes. Stomata emersa, in parte inferiore sporangii. Annulus bi-tri-seriatus, persistens. Peristomii dentes externi 8, rufi, siccitate laxe recurvi, bigeminati, integri, ad apicem obtusum crura connata, articulata, articulis brevissimis, densissime papillosis. Cilia 8, breviora, obtusa, papillosa, dimidiam dentium et ultra attingentes ex 3–4 articulis conflata. Sporæ 24–26 micromill. diametro metientes. *Patria*, Tasmania, ad arbores (W. A. Weymouth, n. 895 et n. 897). Species *O. tasmanico*, H. f. and W., affinis, sed statura multo majore, striis distinctis aliisque notis satis superque distincta."—"On some New Species of Australian Mosses," by V. F. Brotherus, Helsingfors.

Orthotrichum fasciculatum, Mitt., MSS.—Otago; *Buchanan*, Diamond Lake; *W. Bell*. *Orthotrichum beckettii*, C.M., MSS.—On stems of *Discaria toumatou*, Mount Torlesse; April, 1892; No. 382; Arthur's Pass, Selwyn Gorge; *T. W. N. B.*

In 1889 Mr. William Bell sent this moss to Mr. Mitten, who decided that it was new, and wrote: "I have marked a part of Buchanan's specimen of *O. tasmanicum*, *O. fasciculatum*, but it wants more observation. It seems to have a tuft of short branches at the top of its stems with many smaller fruits. The calyptra I am not sure about. Its leaves seem narrower."

It was amongst the mosses I sent to Dr. Müller last year, and he honoured me by calling it *O. beckettii*. As, however, these names are in MSS. only, Dr. Venturi's name takes precedence. I have to thank Mr. Weymouth for authentic specimens.

Orthotrichum hortense, Boswell.

"Habitus *O. affinis*, sed laxior irregulariter cæspitosum; caulis dichotome innovans ramosus. Folia erecto-patentia et recurvata, in statu sicco erecta laxe contorta, e basi dilatata

anguste lanceolata, marginibus ad medium reflexis, ad basin et apicem planis, breviter papillosa; cellulis superioribus densis, rotundatis, inferioribus elongatis, pellucidis, ad margines dilatatis quadratis. Calyptra mitrata, acuminata, straminea, nitida, hirsuta, apice purpurea. Capsula in pedicello brevi, cylindraceo-oblonga, anguste striata, sicca plicata, sub ore lato coarctata. Peristomii dentes bigeminati, rufo-aurantii, sicci reflexi.

"On trees in a garden, Hanmer Plains, New Zealand; *Mr. Roper.* This, with much the general appearance of average *O. affine*, has the leaves more acute, more spreading and subsquarrose, and when dry somewhat twisted; the seta is rather longer and the capsule more exserted; the calyptra more hairy, paler, glossier, yellower, with a purplish apex, like that of *O. straminea*. The exserted capsules give some resemblance to *O. speciosum*, while the red peristome is suggestive of *O. pulchellum*."—"On New Exotic Mosses," by Henry Boswell, M.A., "Journal of Botany," Ap., 1892, xxx., p. 97.

Macromitrium retusum, H. f. and W. Flora N.Z., ii., 79, t. 85, f. 6. Plate XXXB.

Hooker, in Fl. N.Z., figures this moss with retuse leaves, and describes them as "retuse and 2-fid at the apex," omitting any reference to the very remarkable hair-like points with which they are terminated. This was doubtless due to the fact that these points are very fragile, and in the "few barren specimens" from which he drew up his diagnosis they had in all probability fallen off. Their long bristle-like points are articulated at the apex of the leaves, and when they are broken off leave the apex of the leaf with a deep notch. They may be observed in the young comal leaves, and are to be found in great numbers loose in the paper in which the plant has been dried. The moss grows in situations exposed to the vicissitudes of the weather, and the repeated expansion and contraction of the leaves caused by the alternation of moisture and drought causes the points to fall off. I have never seen this moss in fruit.

Hab. On trees, Studholme Bush, Waimate; No. 114c; *T. W. N. B.* (identified by Dr. K. Müller). Lyttelton Hills; *R. Brown.* Tarawera, Hawke's Bay; *H. Hill.* Maungatui, Dunedin, and Wyndham Valley, Southland; *W. Bell.*

Cyathophorum densirete, Broth.

"Dioicum; gracile, viride vel lutescenti-viride, nitens; caulis repens, dense rufo-fusco-tomentosus stipitibus sparsis, erectis, gracilibus, flexuosis, apice plus minusve attenuatis, simplicibus, nigris, dense foliosis; folia sicca vix mutata,

humida patula, asymmetrica, basi latere superiore ventricosa, ovata, acuta, marginibus erectis, e medio ad apicem grosse argute serratis, nervo brevissimo latiusculo, furcato, cellulis rhombeis pachydermibus, superioribus ·045–·06 mm. longis et ·015–·020 mm. latis, marginalibus angustis, limbum indistinctum formantibus; amphigastria multo minora, symmetrica, rotundata, acumine recto, acutissimo, nervo obsoleto; bracteæ perichætii e basi vaginante subito angustatæ, acutæ, apice parce sed grosse serratæ, enerves. Cætera ut in *C. pteridioidi*. *Patria*, Tasmania, W. A. Weymouth (862). A *C. pteridioidi* statura multo minore, areolatione multo densiore et nervo brevissimo differt."—"On some New Species of Australian Mosses," by V. F. Brotherus, Helsingfors.

Hab. On trees, damp forest, Kelly's Range, Westland (446ft.). Arthur's Pass; *T. W. N. B.*

I have received authentic and original specimens of this moss from Mr. W. A. Weymouth (No. 862), but I cannot consider it more than a small form of *C. pennatum*. In many of my specimens of *C. pennatum* of large size the cell-walls are as dense as in the Tasmanian plant, and the length of the nerve is a very unstable character. Mr. T. Kirk, to whom I referred the specimens, writes: "I fully agree with you as to the great range of size and luxuriance of *C. pennatum*. I have seen sterile specimens over 5in. in length, and others under ¾in."

Hypnum (Cupressina) mossmanianum, C.M.

"Monoicum; *H. cupressiformi* simillimum, caulis gracillimus, filiformis, longe attenuatus apice vix uncinatus, ramos multos capillares exserens; folia dense conferta lutescentia, angustiuscula, e basi oblongâ in acumen longum, maxime reflexo-falcatum producta, pallida, margine integerrima erecta, obsolete brevissime binervia, cellulis angustissimis densis pallidis, alaribus in ventrem parvum distinctum congestis, fuscidulis; perich. ext. multo latiora, reflexa, intima in cylindrum angustissimum convoluta, longe vaginantia, apice falcata, inferne elongate densiuscule areolata, theca in ped. longiusculo tenui flexuo rubro suberecta, cylindrica arcuata, tenuis; perist. d. ext. breviusculi angusti lutescentes, intus cristati rugulosi, int. æquilongi perforati albidi rugulosi, ciliis capillaribus singulis longis, læviusculis." *Patria*, Nova Seelandia, ad saxa et truncos arborum putridos siccos sylvarum prope portum Kaipara: Coll. No. 711. Van Diemen's Land, ad rupes, Fern-tree Valley, montis Wellington; No. 832."—Carl Müller, in "Botanische Zeitung," 1851, p. 565.

On dead wood, Otira (alt., 1,450ft.), Westland; *T. W. N. B.*; No. 202 (identified by Dr. K. Müller). Waimate, South Canterbury; *T. W. N. B.* Mount Earnslaw and Diamond Lake, Otago; *W. Bell.* Tasmania; *Weymouth;* No. 368.

Obs. Hooker ("Handbook N.Z. Flora," p. 476) considers this to be a form of *Hypnum cupressiforme*, L.; and this view is supported by Mitten in his "Australian Mosses," p. 39, where he gives it as a synonym of *H. cupressiforme*, var. *minor*, H. f. and W. ("Fl. Tasm.," ii. p. 212).

Pilotrichella billardieri, Hampe (*Neckera*).

"Caulis turgidus, elongatus, pendulus, inordinate ramosus, ramis brevibus, usque uncialibus turgidis, obtusiusculis, folia turgide imbricata, ex basi cordata cochleariformia (basi et apice inflexa) integerrima, nervis binis brevioribus distantibus notata, seta brevis, crassa, basi foliis paucis lanceolatis involuta; theca brevis ovata, operculo conico obtuso, peristomii dentibus rubris. *Hab.* Ad arbores Apollo Bay. *Obs.* Huc *Isothecium flexile*, Brid., ii., p. 362, ex Nova Hollandia, La Billardière. *Neckeræ miqueliancæ*, C.M., ex habitu convenit; ab *Neckera molle* differt; habitu robustiore foliis binervibus et operculo obtuso."—"Linnæa," 1859–60, p. 637.

The leaves are often nerveless, as in *Pilotrichella molle*, and I was unable to detect any nerve in the leaves of the specimen in Herb. Helms., identified by Dr. Müller. The very robust habit, the turgid foliage, and the more obtuse and blunter ramuli form the most distinctive characters. Mitten, in his "Catalogue of Australian Mosses," p. 34, recognises this as distinct from *P. molle*.

Hab. Hanging from trees in damp forests. Fisher's Bush, Oxford. Long Creek, Mount Fife, Kaikoura; No. 13B (identified by Dr. Müller). Kelly's Range, Westland. Peel Forest; *T. W. N. B.* Nelson: *Grant.* Greymouth, Westland; No. 41; in Herb. Helms.; named by Dr. Müller.

Polytrichum (Pogonatum) australasicum, Hp. and C.M.—*Polytrichum tortile*, Hooker in Flora N.Z., ii., 96, non Swartz.

"*P. tortili* simillimum. Dioicum, folia e basi sub-vaginante brevi sub-laxe areolata pellucida lanceolata obtusiuscula planiuscula apicem versus spinulosa serrulata, dorso spinulosa, suprema conformia, omnia siccitate intense viridia, nervo lato multo-lamelloso apicem folii fere totum occupante; theca cylindraceo-oblonga subcernua fusca ubique lævis, operculum conico-apiculatum obtusum breve. In Australia Felici sub No. 25, sine loco indicato. A *P. tortile*, Sib., Fl. Ind. Occid. distinguendum."—"Linnæa," 1853, p. 500.

The Australasian plant seems to be quite distinct from Swartz's *P. tortile* of the West Indies, being distinguished by its more obtuse leaves, its comal leaves being of the same form as the others, and particularly by its smooth cylindric capsule. Mitten, in Musci Austro-Amer., p. 418, describes the

capsule of *P. tortile*, Sw., as being "shortly oval and plicate." Hooker, in Flora N.Z., says that Swartz's original specimens in Herb. Hook. are too imperfect to render the identification of the New Zealand specimens certain.

Hab. In clay. Teremakau, Westland. Hapuka Bush, Kaikoura; No. 250 (identified by Dr. Müller). Peel Forest; *T. W. N. B.* Greymouth; *Gulliver.* Found also in Australia and Tasmania.

ANISOTHECIUM, Mitten. (Journ. Lin. Soc., xii., 39, 1869.)

Mosses resembling *Dicranella* in habit. Leaves gradually narrowed, or from a sheathing base, abruptly subulate, carinate, with the margin plane or recurved, and nerve narrow and well defined below. Capsule always smooth, pachydermous, curved as in *Hypnum*, rarely suberect or less oblique, the cells of the exothecium regularly rectangular-quadrate, with non-flexuose walls. Peristome larger, thicker, deep-purple, more papillose (Lindberg). Deriv. ἄνισος unequal, θήκη a capsule.

The absence of inflated cells at the basal angles of the leaf at once separates *Anisothecium* from *Dicranum.*

Anisothecium clathratum, Mitt. ("Handbook of New Zealand Flora," p. 411—*Dicranum.*)

Hab. On dripping rocks. Mount Torlesse, No. 242B (identified by Dr. K. Müller). Arthur's Pass. Castle Hill, Canterbury; *T. W. N. B.* Tarawera, Hawke's Bay; *H. Hill.* Campbell Island; No. 308; *T. Kirk.*

Anisothecium jamesoni. (Taylor, in Hook. Lond. Journ., vi., 332—*Dicranum.*)

"Cæspitosum; caule elongato. Folia laxe inserta, e basi brevi erectiore subquadrata, cellulis elongatis laxiusculis pellucidis, subito in subulam patentem elongatam obscuram contracta, nervo in subula a folii lamina indistincto, integerrima; perichætialia basi latiora, duplo longiora, obovata. Theca in pedunculo rubro elongato, oblonga, inclinata operculo subulato. *Angstrœmia hookeri,* C. Müll., Syn., ii., p. 607. *Hab.* Andes Quitenses, *Jameson;* Fuegia, *Lechler;* Hermit's Island, *Hooker.* Caulis ½–1½ uncialis. Folia fulva. Pedunculus subuncialis."—Mitten, "Musci Austro-Americani," p. 39.

This is not *Dicranum jamesoni,* Hook., Ic. Pl., i., 179, which Mitten refers to *Campylopus concolor,* Hook. (*Dicranum*). I received from Mr. Kirk authentic specimens of this moss, which were identified by Mr. Mitten. Whangapehatu; *Kirk;* No. 299. I have it also from Greymouth, collected by Mr. Gulliver; *Wright,* No. 804: and from the Bealey River (alt., 2,500ft.); *T. W. N. B.*

Anisothecium gracillimum, sp. nov. Plate XXXc.

Dioicous, small, simple, densely gregarious. Leaves erect, patent, somewhat secund; stem leaves small, base not vaginant, tapering evenly and gradually to the apex, margins quite entire; perichætial leaves semi-vaginant, from near the base narrowing rapidly into a long subulate apex, which is almost entirely occupied by the nerve. Cells large, long, pellucid. Seta red. Capsule erect, regular, short, turbinate, not strumose. Operculum broadly conical, erect, and longer than the capsule. Male plants shorter. Infl. terminal, an innovation frequently springing from below the bracts.

Hab. On clay, Pine Hill, Dunedin; *W. Bell* (named by Dr. Karl Müller). On damp earth, Patterson Creek, Mount Torlesse; No. 396; *T. W. N. B.*

Distinguished by its erect capsule, by its non-vaginant leaves, and by the narrow bases of the perichætial leaves. This species belongs to the group containing *Anisothecium schreberi*, *A. campylophyllum*, and *A. jamesoni*, "an intricate series of forms," as they are designated in the Flora of New Zealand.

EXPLANATION OF PLATES XXIX.–XXXc.

PLATE XXIX.

Campylopus bicolor.

Fig. 1. Comal leaf, × 32.
Fig. 2. Stem leaf, × 32.
Fig. 3. Base of leaf, × 70.
Fig. 4. Cells of leaf, × 270.

PLATE XXX.

Campylopus kirkii.

Fig. 1. Comal leaf, × 32.
Fig. 2. Stem leaf, × 32.
Fig. 3. Base of leaf, × 70.
Fig. 4. Cells, × 270.
Fig. 5. Perichætial leaf (outer), × 32.
Fig. 6. Capsule, × 32.
Fig. 7. Operculum, × 32.

PLATE XXXA.

Dicnemon obsoletinerve, Hp. and C.M.

Fig. 1. Perichætium and fruit, slightly magnified.
Fig. 2. Capsule and operculum, × 32.
Fig. 3. Leaf, × 32.
Fig. 4. Apex of leaf, × 32.
Fig. 5. Base of leaf, × 32.
Fig. 6. Cells of leaf, × 270.
Fig. 7. Apex of perichætial leaf, × 32.

PLATE XXXB.

Macromitrium retusum, H.f. and W.

Fig. 1. End of branch, × 32.
Fig. 2. Comal leaf, with hair-point uninjured, × 32.
Fig. 3. Leaf with hair-point partially broken off, × 70.
Fig. 4. Lower leaf, back view, with "retuse" apex, the bristle broken off.
Figs. 5, 6, 7. Leaves copied from "Flora of New Zealand," t. 85, f. 6.

PLATE XXXC.

Anisothecium gracillimum, sp. nov.

Plant nat. size.
Fig. 1. Leaf, × 70.
Fig. 2. Apex of same, × 270.
Fig. 3. Cells from middle of leaf, × 270.
Fig. 4. Perichætial leaf, × 70.
Fig. 5. Capsule and operculum (immature), × 32.
Fig. 6. Capsule, ripe, × 32.
Fig. 7. Male infloresence, × 32.

ART. XXVIII.—*Notes on New Zealand Mosses: Genus* Pottia.

By R. BROWN.

[*Read before the Philosophical Institute of Canterbury, 1st November, 1893.*]

Plates XXXI.–XXXIV.

THE species composing this genus may be readily distinguished from those comprised in *Gymnostomum*, as the former are either annual or biennial plants, and the leaves have large cellular tissue.

The members of this genus appear to have been entirely overlooked by botanists, as witness the Rev. J. Berkeley, who, in his introduction to "Cryptogamic Botany," actually says, "*This genus does not occur in New Zealand.*" This may possibly be accounted for by the minuteness of the plants, also by the short time it takes them to arrive at maturity.

They are to be found growing on steep damp clayey banks, where the earth during the hot summer months crumbles away, leaving a fresh surface for the spores of those plants to germinate on during the following winter; as their vigorous growth takes place only on freshly-turned soil, too much organic matter in the soil does not suit them. They speedily become extinct in those habitats; when this takes place a higher class of vegetation follows; they therefore form a section of the pioneers of vegetable life.