

**1885 Notes on the Bones of a Species of
Sphenodon, (*S. diversum*,¹ Col.,) apparently
distinct from the Species already known.
Transactions of the New Zealand Institute 18: 118-
123.**

[Read before the Hawke's Bay Philosophical Institute,
14th December, 1885.]

TOWARDS the end of November, 1885, I received a small parcel of little bones from Mr. Mills, of the wood and coal dépôt in this town. It was brought to me by one of his workmen, who said, "they were that morning found in the quarry, while digging, at about forty-five feet below the surface." I was not very well at the time, but on looking at them, I soon saw they had belonged to some small reptile. They were in most excellent preservation, even to their minutest parts and finest processes, and were not fossilized; but, most unfortunately, they were very few of the whole skeleton. On making further inquiry during the afternoon, I found that "the quarry" (which I had supposed to be distant, on the west side of Scinde Island and near the harbour, where the larger quarries are,) was very near me, in Town Section No. 101, and opened on to Tennyson-street South. On hearing this, I called my man, (whom I could trust on such an errand,) and, showing him the little lot of bones, sent him to the quarry to see if he could find any more. On his return, he brought me three additional bones, two of them being the pelvis bones of the skeleton.

¹ *Stet (extinct).*

In more closely examining them on the following day, I was pretty sure they were bones of a small lizard, and probably a species of *Sphenodon*, but whether of the more common species, *S. punctatum*, or of some other species, I could not determine.

I had Dr. Newman's interesting account of his anatomy of a species of *Sphenodon*,² (*S. guntheri*, Buller,) but that treated chiefly on its muscles; and I had no works describing clearly the osteology of the *Sphenodon*, neither were there any in the library of the Hawke's Bay Philosophical Institute, save a partial drawing of its entire skull, in a plate in the "Zoology of the *Erebus* and *Terror* Voyage," but without letterpress or description.

Finding, however, that Dr. Günther's full and able description of the anatomy of *Sphenodon punctatum* was in the library of the Colonial Museum, where also was a preserved skeleton of the animal (mentioned by Dr. Newman in his paper referred to), I wrote to the Director of the Colonial Museum, Dr. Hector, for the loan of both skeleton and book, and very recently I have received both, for which kindness I wish to thank him. [119]

Being thus aided for my task, I was enabled to go to work, and to examine and study the few bones I had obtained; and in this short paper I give you the result.

As I said at the beginning, the bones, unfortunately, were few. The total number of whole bones and pieces was but forty-three, several being small chippy portions of the skull that had separated at their sutures; fortunately the jaws with their teeth were among them, and nearly entire.

2 WC: "Transactions N.Z. Inst.," vol. x., p. 222.

Then, as regards their bulk, a wine-glass would have contained them all. Their complete list, as far as I have been able to make them out (through shortness of time), will run as follow:—

1. *Of the Head*: 6 bones, containing the teeth, viz.:—2 *maxillary*, 2 *mandibles*, and 2 *maxillary-palatal*; also 1 *splenial*, and 1 *articular* (belonging to one of the mandibles), 1 *os quadratum*, and 1, the basal portion of the skull, with *exoccipital* and other bones attached; with a few small, thin, chip-like bones and fragments.
2. *Of the Fore-limb*: 1 *humerus*, 1 *ulna* (whole), and 1 *radius* (part only).
3. *Of the Vertebræ*: 9 joints.
4. *Of the Body*: 8 ribs (some broken), and the pair of *pelvis* bones.

There was also among them what appears to be the tarsus of some small bird, but broken.

I will now give a more particular description of those bones, showing where I have observed them to differ from those of *S. punctatum*, as given by Dr. Günther.

Before, however, that I describe its teeth, I should observe that this animal, like *S. punctatum* and a few others, is a true *Acrodont*; that is, it has no proper teeth set into proper (alveolar) sockets like those of other animals; but its teeth are composed of little bony points, arising from the bone of the jaw itself,³ and are of various

³ WC: To this, I may be permitted to add in a note, that I was the first to point out this curious novelty; and this I did first to Dr. Dieffenbach (in 1841), from my living specimen, which I had and

shapes and sizes, so that it is difficult sometimes to decide whether a tooth or a projection should be considered as one or as three, from the number of its sharp, [120] tooth-like points.⁴ The teeth are mostly broadly conical, especially the maxillary, with their tips truncated or flattened, as if worn; and all with an apparent longitudinal flaw, or crack, extending down the centre of the tooth. At the same time, it seems to me that the structure of the substance of the teeth, from their semi-pellucid appearance, is different from that of the common bone of the jaws.

kept alive for several months. Dr. Dieffenbach then resided at Paihia, Bay of Islands, very near me, and visited me frequently; Dr. Dieffenbach, also, having at that time received from me the very specimen which Dr. Günther has stated in his admirable Memoir as being the first one taken to England, and deposited by Dr. Dieffenbach in the British Museum. (This is extracted by Dr. Günther from Dr. Dieffenbach's early work on New Zealand, vol. ii., p. 205, in which work, however, my quondam friend omitted to mention how and when he received it, as well as several other similar matters relating to specimens of New Zealand natural history, the Maori language, customs, etc., etc. Dr. Dieffenbach never visited the East Coast of the North Island.)

4 WC: As an apt illustration of this, I may here quote what Dr. Newman incidentally mentions in his paper above referred to:—“Drs. Günther and Knox disagree in the number of teeth assigned to each maxilla and palate, but this arises from the fact that Dr. Knox considers several of them complex teeth, while Dr. Günther counts each cone as a distinct tooth. Günther says there are about eighteen teeth in each maxilla, which Knox counts as six. I counted sixteen in mine, and thirteen on each palate.”—(*l.c.*, p. 232.)

I. *Of the Teeth:*—

1. The *maxillary*, or upper jaws: One contains 16, and one 17 teeth, of which the central ones are the largest; in this respect differing largely from *Sphenodon punctatum* (Günther's).
2. The *mandible*, *dentary*, or lower jaws: One contains 16 teeth, and a canine one at the anterior end of the jaw, with no space between them; and one contains 13 teeth with the canine one, and a space between them. These dentary teeth are alternately large and small.
3. The *palatine* teeth also vary in number. In the one, there are 8, and in the other 10, teeth, the anterior tooth being the largest. This one agrees with *S. punctatum* (Günther's).
4. The *intermaxillary* teeth (if there ever were any) are missing.

Here, I may observe, that Dr. Günther says of the teeth of *Sphenodon punctatum*:—"There are originally about 18 in each maxillary, and 11 in each palatine. However, those of the anterior half of the maxillary appear to be soon ground down to the alveolar edge. ... The first palatine tooth is much stronger than, and separated by a short interspace from, the succeeding. ... The alveolar edge of the mandible is polished, bearing about 16 teeth as long as the number is complete; but (as in the maxillary) the teeth are gradually lost from the front backwards." Dr. Günther has also given several drawings of the teeth and jaws of *Sphenodon punctatum*, of both old and young specimens, but none of them agree with these of this specimen.

II. *Of the Dental Bones:*—

1. The upper jaw contains 10 *foramina maxima superiore*: of these, Dr. Günther merely says that “they are present as in other lizards.”
2. The lower jaw contains 6 to 7 *foramina mentalia*: in *S. punctatum* [121] these latter “vary in number from 2 to 4, and are small.” The additional large *foramen* between the dentary and articular bones, mentioned by Dr. Günther as being large in *Sphenodon punctatum*, is also found here in this specimen, and is very large. This lower jaw has lost its *coronoid*, which separated at the suture; the very small and splintery *splenial*, and *articular*, were also separated at their sutures, but these two were with the bones.
3. The *palatine*, with its additional row of bony teeth, is a highly curious bone; when this is fixed in its natural situation in the roof of the mouth, forming an extra line of teeth parallel with those of the upper jaw, the teeth of the lower jaw are so situated as to fall in, or close up, between those two lines.

III. *Of the Remaining Bones of the Skull:*—

1. The inner basal portion, with the *exoccipital* bones, is complete; these are, however, much smaller than those of *Sphenodon punctatum*, yet the occipital hole (*foramen magnum*) is considerably larger. There is a most peculiar isolated internal bone, arising centrally from above the anterior *hypapophysis* of *basi-sphenoid*, and also the *pterygoid*; it is not thicker than a bristle, and about 4 lines long; it is semi-cylindrical, and curved upwards, and wonderfully preserved! There is no such a bone shown in

Dr. Günther's careful and able dissections of the skull of *Sphenodon punctatum*;⁵ but it exists, though smaller and stouter and scarcely seen, in the Wellington specimen (which is badly preserved).

2. The *os quadratum* (1 only) is much broader at the end than that of *Sphenodon punctatum*, as shown in Dr. Günther's plate; besides, the suture joining it to the *pterygoid* is of a different shape; it is also different from that of the Wellington specimen.
3. There are also a few other very small, thin bones, mere chips, separated at their sutures, and not yet ascertained.

IV. Of the Fore-limb:—

Of this, there are 1 *humerus*, 1 *ulna*, and 1 *radius*; the two former are whole, the latter broken. The *humerus* is very stout, and is a beautiful piece of mechanism. Dr. Günther gives no drawing of these bones (though he does of the adjoining *scapula* and *coracoid*), and says very little about them, save that "they are similar in form to those of other known genera of this family." These three bones resemble those of the Wellington skeleton as far as those can be seen.

V. Of the Vertebræ:—

1. There are only 9 joints; 4 *cervical*, of which one joint [122] is the 2nd cervical; 3 *dorsal*; and 2 *caudal*, upper

5 WC: This bone, however, may have been referred to by Dr. Günther, in writing on the palate and its muscles, where he casually mentions "the long styliform process of the pterygoid and ectopterygoid." (*l.c.* p. 600.)

anterior. These are all much smaller, etc., than those (few) shown by Dr. Günther, especially the 2nd cervical.

VI. Of the Remaining Bones of the Body:—

1. There are 8 of the smaller ribs and portions of ribs, none being quite perfect. These are very much smaller than those shown of *Sphenodon punctatum*.
2. The pair complete of *pelvis* bones, which differ considerably from those of *Sphenodon punctatum* (as represented in the drawing), in wanting the “remarkably developed uncinate process of *os pubis*, in the middle of their anterior margin, and the still more prominent *tuber os ischii*” of the posterior angle. Those processes, however, exist in this pair of pelvis bones, but they are smaller, and of a different shape; while those same bones in the Wellington specimen are very much larger and stouter every way.

I regret not having had more of the bones of this little animal, especially those of the upper and fore parts of the head, with the intermaxillary teeth; more of the fore-limb, also those of the hind-limb, and more joints of the vertebral column. Of these latter alone—which joints in *Sphenodon punctatum* amount to 63, all varying exceedingly with their position in the skeleton—there are in this small lot only nine joints, or one-seventh of the complete number!

The whole of the bones of this newly-found specimen are remarkably thin, almost papery (except those three of the fore-limb), and yet generally perfect, and not worn down by friction or wasting. Their thinness, combined with the more sound and larger teeth, serve to show that this

animal must have been young, or, at all events, not a very old one; and yet the teeth are very far from approaching to those of a young one, as shown by Dr. Günther. Again, there is no comparison as to general appearance between these bones and those of the Wellington specimen, which are both larger and stouter, and apparently of a different substance. These bones must have belonged to a much smaller animal than either *Sphenodon punctatum* of Dr. Günther, or that of the Wellington skeleton. At the same time, it must not be overlooked that the *dentary* bone (or lower jaw) of this specimen is quite as large as that of *Sphenodon punctatum* of Dr. Günther, and a little longer than that of the Wellington one.

These bones are not fossilized, neither are they rotten, although so very thin. The old Maoris always said that the tuatara (*Sphenodon* sps.) formerly inhabited the headlands of the New Zealand coast (as well as the islets lying off it), which the finding of this specimen proves. The place where it was found is on the east side of the outer hill forming Scinde Island (Napier), [123] which originally formed a steep slope to the raised beach below. The remains were discovered at a depth of about 45 feet from the surface of the slope, and about 40 feet in from the base, in apparently undisturbed sandy loam. My own opinion is—from having, thirty to forty years ago, seen remarkably large and deep new rents and fissures in the sloping sides of our Hawke's Bay hills, caused by earthquakes, many of them afterwards closing up,—that anciently this little animal, at some such a season, fell into one of those deep rents, and so perished.

In conclusion, I may observe that Dr. Newman also says:—"Three species of *Sphenodon*, unlike in form and colour, have been discovered: 1. *Sphenodon punctatum*, black and spotted; 2. S. (unnamed), green and yellow; 3. *S. guntheri*, lighter. The dark form is found in the North, the intermediate at East Cape Islet, and the lighter form in the South. *S. punctatum* was the form so elaborately described by Dr. Günther. The other species have not been anatomically examined."⁶

Dr. Günther also mentions the possibility of there being two species, although, from the smallness of the material before him at that time (1867,) he does not support it.

Such, however, being the case, and these (few) bones not wholly agreeing with those of *Sphenodon punctatum*, I have named this species *Sphenodon diversum*, but only provisionally, as on further examination of both this and of better specimens, and a closer comparison of them with the bones of those two other specimens mentioned by Dr. Newman, may yet show that these belong to one of those two species.

P.S.—The ordinary meeting of the Hawke's Bay Philosophical Institute, to be held this evening, being the last for this season and year, I have been very desirous of bringing this paper before you, and have only been able to finish it this day.

6 WC: *l.c.*, pp. 222, 223.

**1885 A Description of some newly-discovered
Cryptogamic Plants, being a further
Contribution towards the making known the
Botany of New Zealand.**

Transactions of the New Zealand Institute 18: 219-
255.

[Read before the Hawke's Bay Philosophical Institute,
14th September, 1885.]

INTRODUCTION.

IN my again coming before you with my usual annual tribute, a little basket of gleanings of simples, a small collection of plants gathered in the secluded shades and deep glens of the interior mountain forests, I would beg permission to preface my list of the same with a few remarks *ad rem*.

On this occasion, all that I have to bring belong to the third great botanical division—the class *Cryptogamia*, as it was named by Linnæus. Three of the Orders of this class will be found here represented, though not alike—viz., *Filices*, *Musci*, and *Hepaticæ*. Of the first, or Ferns, I have however only two novelties: one a tree fern of the genus *Hemitelia*, and one a species of *Botrychium*. For this latter we are again indebted to the kindness, mindfulness, and assiduity of one of our members, Mr. H. Hill. Specimens of these two ferns I shall exhibit.

Unfortunately, I shall not be able to show you specimens of the smaller cryptogams, these being all more or less microscopical, so that without a microscope, proper

previous preparation of the objects, and patient attention, nothing worthy of notice could be seen.

Of the second Order, or Mosses, there are specimens of three genera—viz., of *Mnium*, of *Cyathophorum*, and of *Hookeria*; one each of the first two genera, and no less than twelve new species of the last-named, *Hookeria*.

Of the third Order mentioned, viz., *Hepaticæ*, or Liverworts, and of the first division, or foliaceous genera, there are 26 species belonging to six different genera; and of the second, or frondose division of that Order, there are also 17 species pertaining to seven genera, making in all a gross total of 59 new species of cryptogamous plants described in this paper.

Those several genera differ greatly, both in size and in their known homes; some of the genera are exceedingly small and rare; in a few instances, until now, only a single known species constituted the genus, as in *Cyathophorum* (a remarkably fine [220] moss, only found in New Zealand, the islets further south, and Tasmania); also, *Psiloclada* and *Zoopsis*, highly peculiar and beautiful delicate *Hepaticæ*, confined, like the former, to these southern lands. Other small genera, each containing a very few species, are *Fossombronia*, *Noteroclada*, and *Petalophyllum*; while other genera are very large, as *Hookeria*, a handsome and graceful moss, and *Jungermannia*, an elegant *Hepatica*; both of these genera being also found scattered all over the globe, including our native land.

One genus, however, of *Hepaticæ* I must particularly bring to your notice, and this is *Gottschea*, a fine, and pre-eminently beautiful, genus, and one almost

exclusively our own; one which Sir J.D. Hooker, in his handbook, rightly calls "a noble genus;" of this charming genus I have had the good fortune to discover twelve additional species, (besides those recorded in the "Flora of New Zealand,") and I have little doubt that many more species will reward persevering and diligent botanists in the future; for, as Sir J.D. Hooker has further truly observed, "this genus is most abundant in New Zealand." Drawings of many of its species will be found correctly and beautifully executed by Sir J.D. Hooker in his "Flora Novæ-Zealandiæ; and, also, by his father, Sir W.J. Hooker, in his justly-distinguished "Muscí Exotici," whose admirable copperplate engravings of drawings and dissections of those plants, and a large number of cognate ones from this country, must always evoke feelings of wonder and delight. Sir W.J. Hooker's drawings and descriptions of New Zealand cryptogams were published in 1818, and were made from specimens collected in New Zealand at Dusky Bay, nearly 100 years ago, by Dr. Menzies, who visited this country in 1791, in the ship of the celebrated navigator and discoverer, Vancouver, as the surgeon of the expedition. Dr. Menzies seems to have worked with a will in his pursuit of science, particularly in the acquiring of the smaller cryptogams, then not so very highly esteemed, of which he made a large collection both in New Zealand and at Cape Horn, and also in other countries visited by Vancouver in his voyage round the world. Several of our cryptogams, discovered by him, bear his name; conspicuously among them is that magnificent New Zealand moss, *Isothecium menziesii*, of which I can show you a fine drawing in the "Muscí Exotici."

And here I may also briefly notice a very curious double coincidence, or combination of them, that happened at that very period. In 1791, when Dr. Menzies was engaged in the pursuit of science on the inhospitable shores of Dusky Bay, in this country, the celebrated French naturalist, La Billardiere, was similarly occupied on the then equally little known shores of Tasmania and New Holland. And, further still, specimens [221] of the same fine and peculiar species of cryptogams which were discovered by the one in New Zealand, were also discovered by the other in New Holland. La Billardiere's large 4to. work in two volumes, "Plantarum Novæ Hollandiæ," with nearly 300 drawings of new plants, was published early in 1804. Several of our plants also bear, and rightly so, his name. He was the naturalist attached to the expedition under D'Entrecasteaux, sent out by the French Government to discover the fate of, or obtain tidings of the famed, though unfortunate navigator, La Perouse.

I may also remark that these plants described by me in this paper are only a part, and a very small part, of the lesser cryptogams that I have collected during the past two years. A large number, amounting to several hundred specimens, exclusive of these herein described, have been separately put up for Kew, and will be forwarded thither by an early ship; not, however, that all of them are distinct species, for some are more than once repeated—even as I could, at more favourable and suitable times and seasons, find better specimens.

In mentioning this, a passing shade of mournful thought crosses my mind: namely, that that lot will be the *last*, in

all probability, that I with my own hands shall ever collect. Age now, especially when in the dense woods, reminds me that my work of this nature is done. However, for more than half a century, this kind of work has been with me truly a labour of love; one in which the toils, trouble, and fatigue inseparable therefrom have been often forgotten, while enlarged and superior views of God and of nature have continually been attained.

New Zealand has long been noticed as the home of fine and beautiful ferns, but she is also the home *par excellence* of the smaller cryptogams, which, owing to her temperate climate, her many broken gullies—each containing a perennial streamlet—and her dense, shaded, and ever humid evergreen forests, flourish here in great perfection. It is my opinion that scarcely a tithe of those charming and wondrous productions of nature have yet been detected and made known. Rich harvests await her enthusiastic disciples in this direction. May great success and joy of heart ever attend all such.

I have already, in some of my earlier papers read here before you on former occasions, called the attention of the members of this Society to the pleasing, ever-evolving wonders of Nature, as seen in the close examination, the contemplation, and the study of her manifold productions, aided by the microscope. For while, on the one hand, it still remains true that no two leaves, no two blades of grass, are exactly alike in every particular; yet, on the other, the close and wondrous organization, the exact symmetry, and the perfection of all her works is clear and is astonishing. For whether we take, for instance, the tiny [222] leaf of a minute, slender

Hepatica, or of a little wee moss, we shall find the truest adherence to the type in the form and the colour, the structure, and the regular shape of its cellules; and so of the still more minute and more compound microscopical parts of their fructification,—as the external and internal teeth, etc., of the capsule of a moss. Here, in these very minute, and too often overlooked if not despised, productions of Nature, is to be clearly seen her trustiness, her regularity, her profusion, her glory, her beauty! Linnæus, contemplating them, truly exclaimed,—“*Legi aliquot Dei vestigia per creata rerum, in quibus omnibus, etiam minimis, ut fere nullis, quæ vis! quanta sapientia! quam inextricabilis perfectio!*”⁷

Class III. CRYPTOGAMIA.

ORDER I. FILICES.

Genus 2a.⁸ *Hemitelia*, Br.

1. *H. (Amphicosmia) stellulata*,⁹ sp. nov.

Trunk erect, 4–5 feet high, stout, girth at base 2 feet, under crown 1 foot 9 inches, dark brownish black below, covered with its own descending fibrous rootlets, that are

7 WC: *I saw the eternal, immense, all-knowing, omnipotent God from the back passing through and I was greatly astonished. I recognize his footsteps in the things he has created. What power there is in all of creation, even in the most infinitesimal of creatures! What wisdom! What consummate perfection!*” — Bonoan translation.

8 WC: The numbers attached to the genera in this paper are those of them in “The Handbook N.Z. Flora,” but *Hemitelia* is not to be found separate in that work, being placed under *Cyathea*, No. 2.

9 *Cyathea smithii* Hook.f.

soft, spongy, and light coloured at tips. Fronds, 26–30 in a crown, spreading, drooping, bipinnate, broadly lanceolate, not acuminate, 5 feet long, 2 feet 4 inches wide at middle, sub-coriaceous but softish, bright green, glabrescent, shining above, under-surface a little paler and finely stippled with white dots; pinnæ rather close set and overlapping, possessing (with segments) a rumpled semi-rugulose yet pleasing appearance, with numerous weak pale-brownish scattered reticulated scales on costæ and veins, especially on upper surface; stipe stout, very short, triquetrous, somewhat succulent and brittle, dark-brown, muricated (as also is lower rhachis), very scaly at base; scales $1\frac{3}{4}$ inches long, sub-ovate-acuminate with long filiform tips, dark-brown-red, shining, margined, margins erose (not serrulate), cells of centre numerous, narrow-linear, of margin larger and sub-quadrata; rhachis stout, sub-cylindrical, flattish above, pale-yellowish-green, sparsely warted throughout (also stipe) with small oblong and round coloured warts, running in a line between pinnæ; rhachis, secondary rhachises, and costæ densely covered above with reddish and yellowish strigillose hairs, and below with scattered long scarious reddish scales; under them is a peculiar short dark-red starry patent sessile pubescence, very closely set, which, with the long scales, though persistent, are easily rubbed off from exposed parts; pinnæ, middle, 14 inches long, 4 inches [223] wide, linear-acuminate, lower pairs distant and very short, 3–4 inches long; pinnules sub-linear-lanceolate, acute, 2 inches long, 8 lines wide, pinnatifid, regular, alternate, petiolate, petioles very short; segments alternate, 3 lines long, $1\frac{1}{4}$ lines broad, linear, falcate, the upper half coarsely serrate, acute, sessile, slightly

recurved, the lowest pair free, petiolate, and crenate, sometimes only the single lowest one is petioled, this segment is always the shortest on the pinnule, divergent and largely crenate-serrate or lobed throughout; veins alternate, white, rather distant, 6-jugate, stout, lower broadly forked, upper simple, extending to margin, prominent below, sunk above. Sori not numerous, and confined to lower portions of segments and pinnules, rather large, obtusely conical, usually two on a segment on the lowest pair of veins just below the fork, and running in a single line on each side of costa of pinnule and close to it, sometimes (but rarely) 3–5 on a segment, especially the lowest pair; capsules numerous, minute, pyriform, shortly pedicellate, at first green, afterwards reddish, shining; spores trigonous; receptacle cylindrical, elongate, stalked, sub-clavate, puberulous; involucre a shallow membranaceous, whitish, and spreading cup, with even margin, marked with fine and closely-waved lines (*sub lens*), extending round costal half or little more of sorus, sometimes, but rarely, surrounding it at base, and, when so, always unequal, being much larger on the costal side, never, not even in the most incipient state, covering the sorus, which is always largely exposed.

Hab. Edges of forests, banks of streams in the Seventy-mile Bush, between Norsewood and Danneverke, County of Waipawa; 1882–5: W.C.

Obs. I. A species near to *H. smithii*, Hook. fil., (*Cyathea smithii*, "Flora N.Z.", and also "Handbook"), but widely distinct from that species in many characters (*vide* description, *supra*); although, without close examination and comparison, it is likely to be confounded with it,

especially if only herbarium specimens are examined. I was for some years deceived through lack of close investigation, and therefore I have given more minutely its description.

Obs. II. This species (like a few other known ones) is intermediate between the two genera *Cyathea* and *Hemitelia*; and were its sori ever enwrapped in their involucres, it might well be placed under *Cyathea*, but such is not the case.

Genus 31. *Botrychium*, Linn.

1. *B. biforme*,¹⁰ sp. nov.

Rootstock thick; roots many, sub-tuberous, fascicled, straight, vertical, with long spreading horizontal rootlets, yellowish-brown. Plant glabrous. Stipe proper (or lower scape) about [224] 1 inch long, with small ovate and entire membranaceous scales at base. *Sterile fronds* (generally 2): petiole 2–2½ inches long, medium thickness, not stout; lamina broadly deltoid, 3–4 (sometimes, but rarely, 5) inches diameter, triternate, very open and spreading; pinnae distant on long narrow petioles, the central pinna usually the largest; dark brownish-green; texture sub-membranaceous, when dried wearing a rugulose sub-papillose appearance; veins very narrow, prominent, diverging; segments long, narrow, nearly linear, entire, 1-nerved; nerve very slender, extending to apices; tips acute and oftentimes bifid and spreading. *Fertile frond* (sometimes 2): peduncle 6–8 inches long, twice the height of the sterile frond, mostly very slender and flaccid, under 1 line in diameter, sub-

10 *Stet.*

erect and drooping, straight and flexuous, bright orange-coloured and glossy; panicle small, slender, sub-triangular in outline, 1–2 (rarely 2½) inches long, usually 1–1½ inches broad at base, (sometimes, but rarely, 3 inches broad, and when so the basal sub-peduncles are very long and naked below,) bipinnate, open, few and loosely branched; branchlets very short; light yellowish-green. Capsules small, globose, not crowded, sessile and sub-sessile, and (a few) pedicelled; dark-brown; valves oblong-orbicular, broadly gaping, recurved, margins thickened and reverted. Spores whitish, orbicular, slightly roughish.

Hab. In swamps, near Tahoraiti, County of Waipawa; April, 1885: *Mr. H. Hill.*

Obs. I. This species appears to me to be very distinct from all known ones. It usually bears two sterile and sometimes two fertile fronds. The outer or lower sterile frond arises from the base, is largely sheathing and connate; the upper one springs from the stipe about 1 inch above the lower one. When there are two fertile fronds, both are nearly basal from below the petiole of the upper barren frond, and are of equal length, similar to some species of *Anemia*. In one of my specimens the fertile stipe is single below, but divided a little above, each being of the usual size and length. There is a marked difference between the stipes of the barren and of the fertile fronds. These, of the latter, are of a light orange hue, and very glossy; those of the former are stouter, and of a dull brownish-green colour.

II. It is not, however, wholly to its bearing four fronds from one rootstock that I deem this plant to be a distinct

species of *Botrychium*; but also from its linear entire segments, its rich, glossy, slender, flaccid and coloured scapes; its pedicelled capsules; its peculiar shaped valves; its circular spores, and its general outline and loose open appearance. Through the kindness of Mr. Hill, I have received upwards of 20 perfect plants, all good and fresh specimens, and they are very much alike, only one of them slightly differing, and that merely in size. [225]

ORDER IV. MUSCI.

Genus 37. *Mnium*, Bruch and Schimp.

1. *M. novæ-zealandiæ*,¹¹ sp. nov.

Plant rather large, gregarious, prostrate and creeping; fruiting stem erect, $\frac{3}{4}$ -inch high, stout, densely shaggy, with brown rootlets, leaves rosulate at apex, with creeping barren leafy runners at base, 2–3 inches long, proliferous at apex. Leaves large, 3–4½ lines long, 1–2 lines broad, thin, pale (not yellowish) green, oblong and oblong-obovate, flat or very slightly undulate, very obtuse (sometimes retuse), apiculate, broadly margined, margins entire, slightly subsinuate, sometimes the apical portion is finely and distantly denticulate (but scarcely visible under a lens); nerve very stout, particularly at base, continuous but not ex-current; cells rather small, broadly oblong, alike throughout, obscure; leaves on the runners regularly pinnate, the upper half of each leaf free at the base from stem, alternate, with here and there a smaller leaf between on the under and also on the upper

11 *Plagiomnium novae-zealandiae* (Colenso) T.J.Kop.

side of the branch. Fruit-stalk mostly single, sometimes two together, rather stout, smooth, erect, 1–1¼ inches high, slightly curved, reddish below, yellowish-green above, bulbous at base. Capsule oblong, 1 line long, cernuous; external teeth dark-brown, obtuse, each having four dark vertical lines, with their transverse bars in pairs and rather close; internal teeth pale, the transverse bars distant, and the ciliæ between (3–4) long, very slender, and finely knobbed at intervals; operculum the length of capsule, conical-subulate, obtuse, recurved. Calyptra very long, smooth, narrow, conical-subulate, 3 lines long; tip filiform, obtuse.

Hab. Low wet open spots in the interior, 1879–80, but always barren; wet shaded spots, sides of the River Mangatawhaiiti, Seventy-mile Bush, County of Waipawa, 1884: W.C. Glenross, County of Hawke's Bay, 1885: *Mr. D. P. Balfour.*

Obs. This species is near to *M. rostratum*, Schw., and also to *M. rhynchophorum*, Hook., but, after much close examination and comparison, I am satisfied it is specifically distinct. It differs from *M. rostratum* in its larger size, in wanting the ex-current nerve, and in the shape and size of its leaf and operculum, but more particularly in the teeth of its peristome, which differs very considerably from those of that species, as given by Schwaegrichen (Suppl. I., tab. 79); the external teeth of this species are of a very different colour, their transverse bars are closer and in pairs, each tooth also possessing four dark vertical lines; while the internal teeth are without perforations, with their bars more widely apart, and the intervening ciliæ more slender and knobbed at

intervals; also, the vertical lines below the inner teeth do not run straight downwards, neither are the cells there regular, as shown by Schwaegrichen in his drawings, [226] but are of various angular shapes and sizes. This species also differs from *M. rhynchophorum*, Hook., in its operculum and in its leaves, which (in that species) are of a different shape, with their margin closely serrate throughout, and with large open cells at the base of the leaf. Sir. W.J. Hooker does not give any dissections in his plate, neither full particulars of this moss ("Journal Bot." vol. i.), so that I do not know the teeth, etc., of that species. I notice, however, that C. Müller (Syn. Musc., vol. i., p. 158) has united those two species with others, but to me they seem very distinct.

Genus 68. Cyathophorum, Palisot.

1. *C. novæ-zealandiæ*,¹² sp. nov.

Plant rather large, shortly creeping, sometimes tufted; stipe black, sub-rigid, very short, base and roots thickly covered with brown tomentum; stems sub-erect and decurved, (often pendulous,) flat, lanceolate, 2–5 inches long, $\frac{1}{2}$ inch broad at middle, simple and branched above; branches patent, flexible, sub-opposite and pretty nearly together, and sometimes forked and proliferous. Leaves very thin, pellucid, glossy, bright emerald-green, distichous, sub-ovate-acute, cuspidate, $2\frac{1}{2}$ lines long, sub-opposite, distinct, waved, and sometimes more or less slightly plaited, spreading, falcate, dimidiate, the upper basal portion overlapping the stem, the lower excised and not decurrent, the apical portion finely

12 *Cyathophorum bulbosum* (Hedw.) Mull.Hal.

serrate on three-fourths of the upper margin, and on two-fourths of the lower; nerve 0, but in some leaves there is a very short and faint nerve; the leaves also possess a very short, stout petiole-like black nerve at their extreme base, uniting them to the stem, and from it a nerve-like plait runs into the lamina; cells, very narrow, linear and rectangular, arranged in transversely banded and wavy lines. Dorsal leaves broadly orbicular, strongly and distantly serrate above, very much cuspidate; cusp long, curved, aristate and capillary. The dorsal leaves on the branches, however, are sub-ovate-lanceolate, acute, and their lateral leaves are much smaller; perichaetial leaves small, and of two forms: (1) the inner, broad, elliptic or sub-orbicular below, suddenly contracted above, the apical portion long, caudate-acuminate; tip sharply acute with 2–3 serratures some distance below the apex; (2) the outer narrow, acuminate, entire, both nerveless; cells long and narrow. Fruit-stalk erect, short, about 1–1½ lines long, largely bulbous at base, with a constriction between it and the vaginula; capsule oblong, turgid, about one line long, bright-green spotted with red, (sometimes wholly bright-red when mature,) sub-apophysate; and the outer teeth narrow, very acuminate, each with two vertical central lines; the inner teeth with a thick dark central vertical line; operculum small, one-fourth length of capsule, convex or flattish-hemispherical, broader than the contracted mouth of the [227] capsule, with a slender recurved beak; calyptora very small, $\frac{1}{40}$ th inch long, only covering the upper part of the operculum, broadly conical, obtuse, roughish, brownish, the base irregular and slightly sub-crenulate.

Hab. In damp, shady woods, generally scattered among other mosses, etc., on rotten logs, both patent and pendulous; Seventy-mile Bush, County of Waipawa; 1879–1885: W.C.

Obs. I have long known this fine moss in its barren state, and, from my first detecting it, I supposed it to be specifically distinct from the only known species of this genus, *C. pennatum*, Brid. During the winter of 1885, I succeeded in obtaining fruiting specimens, which have fully confirmed my supposition. It differs from *C. pennatum* in several particulars: in size, form (often much and largely branched), and in its proliferous habit; when the tips are bowed down low among other mosses, etc., they often take root, and send forth new plants; in shape of leaves, particularly the dorsal and perichaetial ones; in structure of capsule with peristome, in operculum, and in calyptra; as shown in both Sir W.J. Hooker's admirable drawings and dissections ("Musi Exotici," vol. ii., tab. 163), and also in those of La Billardiere ("Nov. Holl. Plant.," vol. ii., tab. 253), with their respective descriptions. Sir J.D. Hooker has also, in addition, noticed very briefly two varieties of *C. pennatum*—var. α . *minus*, and var. β . *apiculatum*; but as far as I can make out from his very short descriptions, this species is widely distinct from those two forms also; most certainly from the first, var. *minus*, which is a much smaller moss, with orbicular leaves, etc. (a drawing of it is given in his "Flora Antarctica," vol. i., tab. 62, fig. 3); this small variety was originally discovered by him at Lord Auckland's Islands in 1840; and, subsequently by myself, in New Zealand, on the banks of the upper Rangitikei River, in 1848. From the other variety,

apiculatum, this species also differs, as that moss is said to have "shorter leaves" than the type, which are also "apiculate." Evidently, only barren or incomplete specimens of those two varieties mentioned by Sir J.D. Hooker were known to him.

This moss has caused me a large amount of extra labour, extending over several years, in revisiting so often those different localities in the high woods where I had detected and marked it, but always in vain until this year. It bears fruit in the autumn-winter, but not then plentifully; many places of its growth may be repeatedly visited, and very many plants examined, without detecting a single capsule.

Genus 71. Hookeria, Smith.

§ II. MNIADELPHUS.

a. Leaves with thickened margins.

*** Leaves serrulate.**

1. *H. smaragdina*.

**** Leaves entire. [228]**

2. *H. concinna*.

3. *H. microclada*.

4. *H. amæna*.

β Leaves without thickened margins.

*** Leaves entire.**

5. *H. subsinuata*.

**** Leaves serrulate.**

6. *H. pseudo-petiolata*.

7. *H. ramulosa*.

8. *H. subsimilis*.

9. *H. obtusata.*

10. *H. curviseta.*

§ IV. ERIOPUS.

11. *H. petrophila.*

12. *H. pygmæa.*

§ II. MNIADELPHUS.

1. *H. smaragdina*,¹³ sp. nov.

Plant small, erect, densely tufted and matted in large spreading patches, 6–8 lines high, much branched; colour a pleasing bright dark-green; stems and main branches reddish-brown; branches straight, linear, very narrow, $\frac{1}{20}$ th inch wide. Leaves sub-quadrifilariously disposed, very small, close, imbricate, spreading, not much altered when dry; lateral broadly elliptic, dorsal and ventral orbicular, apiculate, narrowly margined, the upper portion very finely and distantly denticulate, but scarcely perceivable under a lens; nerve 1, fine, cellular, extending beyond middle; cells orbicular and very small, but much larger and oblong about base; perichaetial broadly ovate, very finely margined, entire, acute, cells large. Fruit-stalk erect, 4 lines long, usually springing from base of stems below leaves, red, shining, smooth, twisted, black at base. Capsule horizontal, narrow-oblong, somewhat sub-pyriform, sub-apophysate and slightly strumose, contracted below mouth; external teeth dark-brown, broad at base, very acuminate with two vertical central lines, closely transversely striate, margins dark ridged (or

13 *Mniadelphus smaragdinus* (Colenso) Paris.

lined) and wearing a semi-denticulate appearance; internal teeth pale, slender, linear, with one vertical central line and a few distant transverse bars, no ciliæ. Calyptra small, conical, whitish, smooth, base largely fimbriate; fimbriæ spreading, recurved, obtuse; tip acute, black, with 4–10 pellucid, jointed, long white hairs largely produced beyond it, erect and straight,

Hab. On trees and logs, forming large patches; dark shady woods near Norsewood, County of Waipawa; 1885: W.C. [229]

Obs. I. A species near to *H. rotundifolia*, Hook. fil. and Wils., but differing in several particulars: as, erect habit and being much branched, leaves broader and scarcely toothed, with smaller cells and longer nerve; perichaetial entire; fruit-stalk longer, and springing from base of stem; capsule sub-apophysate and strumose, and calyptra with a peculiar long-haired tip.

II. The outer teeth of these species resemble those of *Hypnum tenuirostre*, Hook., and *Isothecium arbuscula*, Hook. fil. and Wils. It is an elegant little plant, though rarely detected in fruit.

2. *H. concinna*,¹⁴ sp. nov.

Plant procumbent in thick spreading tufts or small cushions, densely imbricate, much branched, soft, pale-green with a dash of yellow, and numerous very fine rootlets. Stems (and branches) brownish-red, 1–1½ inches long, rather stout, flattish, sub-deltoid, pinnately branched; branches numerous, close, irregular in length,

14 Not found. The name had been used earlier in 1825 by Hooker.

$\frac{1}{4}$ – $\frac{1}{2}$ inch long; branches linear, obtuse, patent, opposite (sometimes sub-opposite). Leaves very delicate, closely set, and somewhat sex-fariously disposed, broadly obovate-spathulate, about $\frac{1}{2}$ line long, narrowly margined, entire; margin thickened below on narrow basal part of leaf; very obtuse, with a minute apical and mucro from [230] margin only; nerve very fine, sub-sinuous, cellular, and extending two-thirds of leaf, shortly bifid a little below the top, the branch nerve very short; cells hexagonal-orbicular, very small at apex, much larger and oblong-hexagonal at base; perichaetial oblong-ovate, sub-acute, cells larger, oblong. Seta slender, flexuous, 12–15 lines long, somewhat compressed, curved, twisted, smooth, glossy red. Capsule horizontal and cernuous (immature). Calyptra nearly 1 line long, enclosing capsule, narrow, glossy, black half-way from apex, largely fimbriate at base.

Hab. On upper branches of high trees, where it forms large and thick patches, and on the ground (but more rarely); dry forests near Norsewood, County of Waipawa; 1885: W.C.

Obs. A species near to *H. adnata*, Hook. fil. and Wilson, differing, however, in its larger size and being much branched, in form of leaf and cells, in length and structure of nerve, in its much longer seta, etc. A very pleasing little species. It does not alter much in drying. Rarely detected in fruit.

3. *H. microclada*,¹⁵ sp. nov.

Plant small, sub-erect, 6–8 lines high, pale yellowish-green; stems stout, red-brown, except their tops, which are the same colour as the leaves; much pinnately branched from base; branches compressed with numerous fine red rootlets below. Leaves sub-sexfariously disposed and nearly alike, very close, imbricate, spreading, delicate, obovate-spathulate, entire, narrowly margined, slightly sub-sinuate, very shortly apiculate from margin only; nerve single, slender, extending beyond middle; cells orbicular, very minute and partially obscure in the upper half, large oblong and clear in the lower; perichaetal broadly ovate, entire, acuminate; cells large and clear. Fruit-stalk 6–7 lines long, slender, smooth, flexuous, red, black at base, 3–5 on a branch; capsule very small, ob-conical, plain, sub-horizontal, brownish-red, broadest at mouth; outer teeth dark brown, closely transversely striate with sub-denticulate margins (as in *H. smaragdina*, Col., *supra*); calyptra long, conical, covering capsule, smooth, upper half black and glossy, apex much produced, sub-piliferous, base fimbriate; fimbriæ spreading, wavy.

Hab. On trees; dry forests near Norsewood, County of Waipawa, 1885: W.C.

Obs. A species pretty closely allied to *H. sinuosa*, Hook. fil. and Wils., but differing from that species, in its being much and pinnately branched, in its leaves being sexfariously disposed, delicate, with a very narrow and much less sinuate margin, and also apiculate; in the large

15 *Distichophyllum microcladum* (Colenso) Broth. ex Paris.

cells of the lower half of leaf, and in the perichaetial being acuminate; also, in the shape of its small capsule, and its much shorter fruit-stalk, and in its smooth and glossy tipped calyptra. When dry its leaves are crisp; it moistens readily.

4. *H. amœna*,¹⁶ sp. nov.

Plant small, erect, $\frac{1}{2}$ inch high, shortly branched at top, yellowish-green; and stems rather thick, dark brown, leaved to base, branches sub-compressed. Leaves numerous, close, imbricate, sexfariously disposed, very small, $\frac{1}{30}$ th inch long, broadly spatulate, margined, entire, apical portion sub-orbicular, apiculate, margin very narrow, thickened on the basal portion of leaf; nerve 1, slender, sinuate, extending beyond middle; cells orbicular and very minute in the upper broad part of leaf, large oblong, quadrate in the lower portion; perichaetial small, similar in shape, with long cellular acuminate scales within them; cells very large and clear. Fruit-stalk slender, 4 lines long, suddenly curved at apex, flexuous, twisted, smooth, shining, red, black and much thickened at base, springing from a tumid sheath or support (something like *Cyathophorum pennatum*) at middle of stem; capsule minute, $\frac{1}{30}$ th inch long, narrow-ovate, pendulous, pale, finely and slightly tubercled at base; operculum not seen. Calyptra (young) narrow-conical, acute, greenish-white below, brown above and black tipped, the narrow upper portion slightly and finely roughish (under lens), largely fimbriate at base; fimbriæ spreading, obtuse.

Hab. Hidden among other mosses, etc. (whence it was picked out long after collecting); dry woods, near Norsewood, County of Waipawa, 1884: W.C. [231]

Obs. This species is wholly unlike all others of this genus known to me. Having but a small tuft of a few stems, containing only one fruiting specimen, I did not break it up to examine its teeth, which appear to be very small and slender. It moistens readily.

5. *H. subsinuata*,¹⁷ sp. nov.

Small, tufted, erect, 6–8 lines high, simple (sometimes slightly short-branched at base), linear, broadest at top; stem short, stout, dark-brown, leaved from base; rootlets many, fine, red, at lower part of stem and base. Leaves small, numerous, close, imbricate, sexfariously disposed, all similar, $\frac{1}{2}$ line long, obovate-spathulate, apex very obtuse and shortly apiculate, margin entire and slightly sinuous, light-green, finely nerved throughout $\frac{3}{4}$ ths or more of leaf, apical portion of nerve sinuous; cells, upper half exceedingly small, orbicular, the basal portion very large and clear, sexagonal-oblong; perichaetial small, oblong-acuminate, hyaline, nerve 0. Fruit-stalk erect, 3–5 lines long, slender, sub-flexuous, red, shining, black at base, 3–4 on a branch. Capsule (immature) narrow-oblong, gibbous above, nearly straight below, sub-apophysate, cernuous, shining, green with small red tubercles at base; operculum short, conical, obtuse; calyptora rather small, narrow, greenish-white, upper portion black, shining, tip acute, recurved; largely fimbriate at extreme base; fimbriæ spreading, sub-curly

17 *Distichophyllum subsinuatum* (Colenso) Broth.

and waved (not straight), hyaline, linear, obtuse, containing dark-brown linear-oblong masses.

Hab. Among other mosses on rotten logs; low wet woods near Norsewood, County of Waipawa, 1885: W.C.

Obs. A species near to *H. flexuosa*, Mitten, but differing in several particulars.

6. *H. pseudo-petiolata*,¹⁸ sp. nov.

Plant small, tufted, erect, $\frac{3}{4}$ inch high, simple and 3-branched at top; stems stout, dark-brown below, green and highly cellular above, with red rootlets at base.

Leaves pale green, oval, oblique, obtuse, $1\frac{1}{2}$ lines long, somewhat distant, sub-decussate, serrate, lower margin near base excised and entire, lateral joined to stem by nerve only; nerve 1, very stout, cellular, extending half-way and forked about the middle, branch short; dorsal and ventral leaves similar but smaller, and broader at bases; cells large, sub-orbicular, equal throughout; perichaetial very small, nerveless, entire, ovate, sub-acute and acuminate, tip obtuse with (sometimes) two serratures. Fruit-stalk springing from near base, erect, 10 lines high, wiry, rigid, shining, flexuous, dark-coloured, thickened at base, sometimes 2–3 on a branchlet. Capsule small, oblong, horizontal, spotted, finely reticulate, slightly tubercled at base; calytra narrow conical, 1 line long, smooth, brownish, highly cellular; tip long, curved, acute; base slightly ragged. [232]

Hab. On rotten logs, forests near Norsewood, County of Waipawa; 1884: W.C.

18 Not found.

Obs. This little species presents a rather novel appearance from its leaves being scarcely broader at base than their stout nerve, and so giving them the appearance of being petioled. When dry, its stems and leaves are dusky green and blackish and completely curled up, but relaxing quickly on being moistened; their tips remaining recurved.

7. *H. ramulosa*,¹⁹ sp. nov.

Plant small, tufted, dendroid, stems $1\frac{1}{2}$ inches high, erect, stout, dark-brown, covered with old leaves persistent below, branched at top 3–12 branches, each branch densely clothed with fine branched brown rootlets; branches narrow, 4–5 lines long, $1\frac{1}{2}$ lines wide, simple and forked, flat, recurved, dark-green (almost black when dry). Leaves quadrifarious, sub-imbricate above, somewhat scattered and distant below; lateral obliquely oblong, broad, obtuse, spreading, small, less than 1 line long, somewhat irregular in size, the upper half of margins sharply and irregularly serrulate; nerve stoutish, shortly bifid, extending not quite to middle; dorsal and ventral elliptic-ovate, sub-acute, nerve short; cells rather small, orbicular, nearly alike throughout; perichaetial broadly-ovate, sub-acuminate, very membranaceous, cells large oblong and clear, nerveless. Fruit-stalk erect, 4–7 lines high, smooth, rigid, red-brown, thickened and curved at base, springing somewhat laterally from upper side of branch near base, sometimes two together, and 5–6 on a single plant. Capsule narrow, about 1 line long, sub-horizontal,

19 *Pterygophyllum ramulosum* (Colenso) Broth. ex Paris.

greenish, finely striate, with a few small and scattered, coloured, smooth tubercles at base. Operculum shorter than capsule, narrow, very obtuse. Calyptra as long as capsule, smooth, naked, cellular, and very much so, and slightly laciniate at base.

Hab. On logs among other mosses; wet shaded woods near Norsewood, County of Waipawa; 1885: W.C.

Obs. A species near to *H. nigella*, Hook. fil. and Wils.

8. *H. subsimilis*,²⁰ sp. nov.

Plant small, monœcious, tufted, sub-dendroid. Stem erect, $\frac{1}{2}$ – $\frac{3}{4}$ inch high, branched at top into 3–6 branches, sometimes single; colour dusky-greenish. Leaves sub-quadrifariously disposed, $1\frac{1}{2}$ lines long, oblong, slightly obtuse and sub-acute, sharply serrulate, $\frac{3}{4}$ length from apex, nerved to beyond middle, and bifid near top; cells sub-orbicular, small, but much smaller at margins; dorsal and ventral broader and sub-acute; perichaetal oblong-lanceolate, acuminate, entire, nerveless; cells large linear-oblong. Fruit-stalk 10 lines long, erect, slender, flexuous, twisted, slightly thickened at base, dark-brown, springing from upper side of stem, but near base, 2–3 on a branch.

[233]

Capsule oblong, spotted with dark-red spots, tubercled, pendulous; operculum long, half length of capsule, acute, and slightly recurved; calyptra long, conical, narrow, obtuse, smooth, laciniate at base.

20 *Pterygophyllum subsimile* (Colenso) Broth. ex Paris.

Hab. In dark, low woods, near Norsewood, County of Waipawa; 1885: W.C.

Obs. A species allied to the preceding (*H. ramulosa*), but shorter and less dendroidal, with fewer branches; leaves much larger, not so dark, and not blackish when dry, with a longer nerve, and minute marginal cells; fruit-stalk much longer and twisted; capsule thicker, tubercled, and pendulous; and calyptra lacerated at base. It is also a much scarcer plant; only a few fruiting specimens obtained. Leaves do not moisten readily.

9. *H. obtusata*,²¹ sp. nov.

Plant small, tufted, erect, $\frac{1}{2}$ – $\frac{3}{4}$ inch high, branched from near base, with 3–6 branches, branches recurved. Leaves very small, $\frac{1}{20}$ th inch long, rather loosely disposed and sub-imbricate, broadly elliptic, very obtuse, serrate, the young ones and branches light green, very dark green when old, also when dry, fringed at margins below; nerve stout, short, bifid, cellular; cells large orbicular, alike throughout; dorsal and ventral leaves similar but smaller; perichaetial broadly-ovate, suddenly contracted and acuminate at apex, entire, nerveless; cells large-oblong. Fruit-stalk erect, 5 lines long, bulbous at base, smooth, dark brown; 2–3 on a branch. Capsule, oblong, drooping; operculum nearly length of capsule, slightly recurved, acute; calyptra conical, smooth, acute, apiculate, entire at base or very slightly ragged.

Hab. In low, wet, shaded woods near Norsewood, County of Waipawa; 1885: W.C.

21 *Pterygophyllum obtusatum* (Colenso) Broth. ex Paris.

Obs. A peculiar and pleasing little species. Its leaves are often fringed at (or within) the margins on the under side with minute, jointed, cylindrical cellular bodies, in thick, powdery clusters, resembling the *soredia* of some lichens. Sometimes all the leaves on a branch are thus fringed, and, again, sometimes a branch is without any.

10. *H. curviseta*,²² sp. nov.

Plant small, erect, $\frac{1}{2}$ inch high, sub-dendroidal; stem short, $\frac{1}{4}$ inch, dark-brown, leafy, with numerous brownish-red rootlets at base; 4–5 short sub-rosulate branchlets at top, spreading, decurved. Leaves very thin and pale; lateral sub-oblong-ovate, obtuse, $1\frac{1}{4}$ lines long, upper half coarsely serrulate, the lower basal margin excised; nerve 1, stout, not extending to middle, bifid, the branch nerve very short; cells large, orbicular, pretty uniform throughout, but larger and oblong at base; dorsal and ventral leaves broadly-ovate-orbicular, very obtuse; [234] perichaetial small, narrow-ovate, acute, entire, nerveless; cells large, clear. Fruit-stalk $\frac{1}{2}$ inch long, erect, suddenly curved at top, smooth, red-brown, dark at base, 2–3 springing from axils of branchlets; capsule sub-ovate-oblong, nearly 1 line long, pendulous, pale reddish-brown, spotted with fine red dots, and finely tuberculated at the base usually in a kind of ring around it, minutely reticulated, margin of mouth dark; outer teeth rather short, obtuse, incurved, dark brown, with two broad vertical, light-brown equidistant lines, the centre partially clear, largely transversely

22 *Pterygophyllum curvisetum* (Colenso) Broth. ex Paris.

striate, margins grossly sub-denticulate. Operculum and calyptora not seen.

Hab. Concealed among *Hepaticæ*, and from rotten logs; woods near Norsewood, County of Waipawa; 1884: W.C.

Obs. A species having some affinity with *H. obtusata* and *H. subsimilis* (mihi, *supra*), but differing from both in several particulars. Only two fruiting specimens have been detected, long after journey, among *Hepaticæ* collected.

§ IV. ERIOPUS.

11. *H. petrophila*,²³ sp. nov.

Plant large, creeping at base, bushy, simple (rarely branched), diffuse; stems numerous, erect, 1½–2 (rarely 2½) inches high, 5–6 lines broad, flat, recurved at tips, of a pleasing bright-green inclining to dark, clothed with leaves from base, with many brown shining branched flattish rootlets below. Leaves sub-quadrifariously disposed, imbricate, thin, margined, margin narrow above, broader at base, upper half sharply serrulate, lower entire; cells large, sexagonal-orbicular, pretty uniform, but smaller and more orbicular at apex, and larger and oblong at base; lateral leaves oblong or sub-obovate, 2½ lines long, dimidiate, spreading, narrowed at base, tip suddenly acute, sharply apiculate, and curved on one side; nerve 1, very stout at base, straight, forked, largely divergent ⅓rd length of leaf; dorsal and ventral leaves smaller, much more orbicular, and more largely apiculate; nerves 2 from base, diverging; perichaetal

23 *Eriopus petrophilus* (Colenso) Broth.

small, transparent, the outer broadly elliptic or sub-orbicular, the inner narrow ovate, all acuminate, the outer being very acuminulate or sub-piliferous, margins entire, serrulate at tips, nerveless; cells linear-rhomboidal, acute. Fruit-stalks 1–2–3 on upper part of stem and near each other, 3–5 lines long, succulent, green, thickened at base with a dark ring, annulated, hairy; hairs very short, thick and sub-tuberculous, patent, larger and longer at top, and these erect and forming a kind of small crest, but very distant from capsule and apex of seta, which are both glabrous, upper part of seta largely glabrous on the under side. Capsule oblong-elliptic, smooth, horizontal, with an elevated ring at mouth and contracted below, sub-apophysate, base slightly tubercled, dark-brown; teeth pale-red, [235] smooth, with numerous small orbicular cells, margins entire; operculum long, semi-conical, acute, beak very long, slender, straight. Calyptra large, broadly conical, obtuse, $\frac{1}{10}$ th inch long, whitish, upper half thickly tubercled (or sub-echinate); tubercles irregular, long, blunt; lacinate and much fimbriate below; fimbriæ ragged, branched, spreading, obtuse, recurved. Monoecious; paraphyses numerous near bases of fruit-stalks; antheridia axillary near capsules, each linear sac clavate, containing a red globular spot near apex.

Hab. On stones in the bottoms of narrow deep watercourses; dark shaded woods near Norsewood, County of Waipawa; 1884–5: W.C.

Obs. I. A very fine species, certainly approaching very near to *H. cristata*, Arn.; but, after long and repeated examination, I cannot but deem it to be distinct. It also

has some affinity with *H. lophophora*, Col. ("Trans. N.Z. Inst.," vol. xvii., p 260). It differs, however, from *H. cristata* in size, habit, and form of stems and leaves, and in their colour, and in the form of its capsule, which is also sub-apophysate and tubercled (*vide Hedwig, Sp. Musc.*, t. 49); in form and size of apex of leaf and apical cells (*vide Schwg. Suppt.*, tab. ccxxviii., figs. A. B.); in its large and broad sub-tuberulous calyptora, laciniated at base; and in the short, thick, patent hairs on its seta and crest; and also in its peculiar *habitat* or place and manner of growth.

II. I have only met with this moss in deep, dark gullies, where it must be nearly always submerged; it clings strongly by its roots to pebbles in the soil, so that the support comes away with the plant in collecting; it bears fruit in June and July. Plants that I brought away living have flourished three to four months in a tumbler of water, in which they are mostly kept submerged.

12. *H. pygmæa*,²⁴ sp. nov.

Small, tufted. Stems erect, 4–6 lines high, glossy dark-brown below, pale-green above. Leaves loosely imbricate above, distant below, light-green, crisped, and recurved when dry; lateral spreading, rotundato-ovate, largely apiculate, margined, serrate at top and for half-way down; lowest stem-leaves acuminate; nerve 0, or very short; cells rhomboidal, small at apex, increasing in size downwards, and large at base; perichaetal long, narrow-ovate, entire, very much acuminate, the mucro subulate sharp, slightly serrulate at tip. Fruit-stalk 2 lines high,

24 *Eriopus pygmaeus* (Colenso) Broth.

erect, flexuous, with a sudden bend at top, red-brown below, very hairy, with short patent hairs broad at bases or sub-muricated, hairs longer above with a crest of long white fimbriæ at top. Capsule small, ovoid, horizontal, apophysate; operculum flattish, with a long decurved acute beak; calyptra small, pale, largely laciniate and fimbriate at base; tip long, brown, shining, decurved.
[236]

Hab. Among other mosses on rotten logs; low, damp, dark woods near Norsewood, County of Waipawa, Nov., 1884: W.C.

Obs. An interesting little crested species, apparently near to *H. flexicollis*, Mitt. (of which S. Island species, however, I have not seen any specimens, and the description given of it in "Handbook N.Z. Flora" is scarcely complete). At present this species is very scarce, only one small tuft containing three fruiting specimens having been detected, after a most diligent and renewed search.

ORDER V. HEPATICÆ.

Genus 1. *Gymnomitrium*, Corda.

1. *G. orbiculata*,²⁵ sp. nov.

Plant minute, erect, short, simple, sometimes with innovations, rarely branched, 6–8 lines high, pale-green, with fine long hyaline rootlets; leaves alternate, orbicular, entire, rather distant below, but sub-imbricate and larger

25 *Solenostoma orbiculatum* (Colenso) R.M.Schust.

at tips; perichaetial large surrounding calyptro 5-lobed, lobes ovate-acuminate, obtuse; fruit-stalk 1½ lines long; capsule dark-brown; valves spreading, broadly lanceolate, much and irregularly reticulate, margins white and slightly sinuate; tips obtuse, naked.

Hab. Sides of perpendicular wet cliffs, River Mangatawhainui, near Norsewood, County of Waipawa; growing very closely intermixed among *Aneura muscoides*, Col.;²⁶ October, 1884: W.C.

Obs. This species in size and appearance is not unlike the only other known New Zealand species, *G. concinnum*, Cord., detected by me on the summits of the Ruahine mountain range, its only known New Zealand habitat (but also found in Britain); it is, however, widely different as a species. Its only known habitat is a curious one; closely bound up (or squeezed tightly) among *Aneura muscoides* (*infra*), and only to be detected (when not in fruit) by the extreme tips of its leaves just peering above those of the *Aneura*.

Genus 2. *Jungermannia*, Linn.

1. *J. humiliissima*,²⁷ sp. nov.

Minute, shortly tufted, erect, 3–4 lines high, pale-green, with fine long rootlets below and at base. Leaves laxly imbricate, sometimes more distant, sub-vertical, amplexicaul, slightly decurrent, sub-orbicular, quite entire, apical margins very slightly sinuate, recurved; involucral similar but larger, conniving; cells minutely

26 WC: See p. 251 *infra*.

27 *Jungermannia inundata* Hook.f. & Taylor

beaded; apical small, orbicular, basal larger, oblong. Stipules 0; perianth 5-plicate, mouth contracted, toothed. Fruit-stalk 5 lines long, slender, capsule globose, very small, dark purple, glossy. [237]

Hab. Closely mixed with other small *Hepaticæ* and minute mosses, wet stony sides of the River Mangatawhaiiti, County of Waipawa; 1885: W.C.

Obs. A species having affinity with *J. inundata*, Hook. fil., also found in this district.

2. *J. rufiflora*,²⁸ sp. nov.

Small, densely and regularly tufted in large spreading patches, erect, 3–6 lines high, pale-green, simple and branched below, connected at base, stems succulent, flexuous. Leaves few, vertical, alternate, distant, sometimes laxly imbricate, especially on old stems; smaller orbicular and pink-margined below, gradually increasing in size, elliptic and sub-apiculate above; semi-amplexicaul, quite entire, very membranous and translucent, somewhat recurved; involucral 1–2, very similar, but larger; cells large, sub-orbicular, nearly alike throughout, the upper minutely and many beaded.

Perianth large (for the plant), about 1 line long, obovate-spathulate, 4–5 plicate, mouth large, laciniate, tips pink-red. Stipules none. Fruit-stalk 3 lines long, slender; capsule globose, dark brown; valves broadly oblong-lanceolate, reticulate, slightly margined; tips very obtuse.

Hab. Steep shaded and wet cuttings, clayey sides of main road near Norsewood, County of Waipawa; 1885: W.C.

28 *Jungermannia inundata* Hook.f. & Taylor

Obs. A species having pretty close affinity with the preceding species (*J. humilissima*, mihi). It is a striking and neat object in its flowering season, owing to the tips of its numerous and compact perianths being coloured a lively pink-red, and generally each stem bearing one, and all of a uniform height, so that it is detected at some distance when passing by.

3. *J. paucifolia*,²⁹ sp. nov.

Plant small, tufted, densely compact; stems erect, 4–6 lines high, regular, simple, rarely branched at base, light green, with many fine pellucid rootlets springing from bases of leaves. Leaves few, rather distant, alternate, vertical, $\frac{1}{20}$ th inch long, broadly sub-orbicular, somewhat truncate at tip, recurved, undulate and sub-plaited, narrowly margined; margins entire, those of upper leaves sub-sinuate; sub-canaliculate, not decurrent on stem, largest above and very small at base; cells large, oblong, each 5–7 beaded; involucral similar, but larger. Stipules 0. Perianth broadly obovate, slightly compressed, with sinuous edges, apex very truncate, 5–6 plaited at top, mouth contracted, tips curved, acuminate, each with a minute pencil of 3–4 fimbriæ. Seta 2 lines long, slender, twisted, transversely veined. Capsule very minute, globular, dark brown, bursting rather irregularly; valves narrowly margined, obtuse, and much reticulated with black lines.

Hab. In large patches with the preceding species (*J. rufiflora*); patches generally distinct, but sometimes intermixed; 1885: W.C. [238]

29 *Jungermannia inundata* Hook.f. & Taylor.

Obs. This species is nearly allied to the two preceding ones, but distinct. It also flowers much later in the season.

Genus 7. Gottschea, Nees.

* Leaves stipulate.

1. *G. laete-virens*,³⁰ sp. nov.

Plant gregarious, procumbent, imbricate, simple, 1 inch long, 4 lines wide, flattish, sub-linear-obovate, sometimes shortly 2–3 branched near top. Leaves lively emerald-green, very thin, ovate, obtuse, spreading, serrulate at tips, ciliate on upper margins near stem, distant and free below, imbricate and crowded above; ventral lobes more largely serrate at tips; the dorsal of a similar shape but smaller, their upper edge nearly entire, lower edge adnate on ventral lobe; involucral lacinate. Stipules rather large, 4–5-fid, much lacinate and spreading; cells oblong-orbicular, walls thickened; fine purple rootlets on lower part of stem.

Hab. In patches on rotten logs, woods near Norsewood; and more largely on the ground in dark shaded low woods, sides of River Mangatawhaiiti, between Norsewood and Danneverke, County of Waipawa, 1884–5: W.C.

2. *G. nitida*,³¹ sp. nov.

Plant gregarious, procumbent, imbricate, green, stems stout, 2 inches long, $\frac{1}{2}$ inch wide at broadest part, simple, and 2–3–4 branched; branches patent, irregular, flattish,

30 *Schistochila unguicularis* (Hook.f. & Taylor.) Steph..

31 *Schistochila balfouriana* (Hook.f. & Taylor.) Steph.

sub-linear-obovate. Leaves sub-oblong-lanceolate, subacute, patent, sharply and closely serrulate, largely ciliate on both margins near bases, but most so on the upper, also at tips, distant and free below, much crowded above; the dorsal lobes oblong, truncate at tip, the upper edge and apex largely ciliate-serrate; ciliæ jointed; lower edge adnate on ventral lobe. Stipules large, laciniate to base, 5–6 lobed, very ciliate; ciliæ long, jointed, drooping, glossy; perichaetial pale-green, long, narrow, and much laciniate; cells orbicular, and larger than in *G. læte-virens*; many red rootlets at base and on lower half of stem.

Hab. In patches on the trunks of large trees; dark shaded woods, near Norsewood, County of Waipawa, 1885:
W.C.

Obs. A fine species, having affinity with the preceding (*G. læte-virens*), which it closely resembles at first sight, but is very different in structure, more compound and larger.

3. *G. macroamphigastra*,³² sp. nov.

Plant in small patches, sub-prostrate, ascending, pleasing green, stems thick, succulent, oblong, 10–15 lines long, 4 lines wide at broadest part near top, shortly branched, rooted below; root-stock stout; rootlets numerous, short, red, and matted. Leaves spreading, lobes concave; ventral oblong, acute, falcate, [239] serrate above, laciniate below; dorsal shorter, tips sub-truncate and serrulate, rotund and overlapping at base, and much broader than the ventral lobe, margin there entire, or under a high

32 *Bazzania adnexa* (L. & L.) Trevis.

power minutely serrulate in the anterior portion, the apical serrulate on both margins with a narrow plait extending from lower point of apical margin to outer margin of ventral lobe; involucral narrow, 2 lines long, much and compound lacinate, connate at base; cells orbicular. Stipule very large, sub-quadrata, 1½ lines wide, sub-bilobed at tip, much lacinate; laciniæ largely cellular throughout.

Hab. On rotten logs, among other *Hepaticæ* and mosses, Seventy-mile Bush, County of Waipawa; 1883: W.C.

Obs. A very distinct species, from its large and broad stipules, and the concave lobes of its leaves; hitherto, however, it is rather scarce.

4. *G. heterocolpos*,³³ sp. nov.

Plant small, procumbent, spreading, pale green, stems stoutish, leaved to base, 1–1½ inches long, 3–4 lines broad, much (5–6) branched, branches short, flattish; rootlets purple, very numerous, short and matted below. Leaves sub-ovate, falcate, acute, finely and sharply serrate; ventral suberulent or minutely and closely roughish at tips on both sides, lacinate-ciliate on lower basal margins; dorsal similar in shape, but much smaller and smooth, obtuse and sub-truncate at tips, with finer and more distant serratures, and a ridge or plait running from the lower angle of apex to outer margin of the ventral lobe, basal margin almost entire; cells sub-orbicular, cell-walls thick. Stipule rather large, sub-quadrata-cuneata, narrowest at base, bifid, lobes divergent, each lobe sparingly and coarsely lacinate

33 *Schistochila repleta* (Hook.f. & Taylor.) Steph.

above, not below, sinus large orbicular. On the stem on each side, within the two lobes, and in their axils, are several small narrow scale-like laciniate processes or leaflets, and also in minute tufts near to the bases of the stipules, but separate and above them.

Hab. In forest, Seventy-mile Bush, County of Waipawa; 1882: W.C.

Obs. The exact locality of this peculiar species is at present unknown; the few specimens I have were brought hurriedly away, and merely for comparison, believing them to be identical with other species lately detected there by me. I may, however, find it again.³⁴ It is a highly curious species, in its possessing those minute, scale-like leaflets in the axillæ of its leaf-lobes; in this character, however, it is something like *G. nobilis*, Nees, the only other species known to possess it. [But see the following species, recently discovered.] [240]

5. *G. trichotoma*,³⁵ sp. nov.

Plant procumbent, spreading, 2–3 inches long, much branched, main branches generally trichotomous at tips; stems leafy, stout, with many brown rootlets at bases, branches about 1 inch long, 4 lines wide, linear, obtuse, slightly rooting at bases; rootlets brown. Leaves a pleasing green, spreading, rather distant below, base of stem bare, close above, oblong-ovate, obtuse, sharply and closely serrate, laciniate-ciliate on basal margins, a ridge or plait running from lower anterior angle of dorsal lobe

34 WC: Since writing the above, I have again found this plant; June, 1885; its exact locality is in wet low woods, near Norsewood.

35 *Schistochila balfouriana* (Hook.f. & Taylor) Steph.

to the margin of the ventral, with a few other small, scattered, short creases or low plaits on its lamina; dorsal similar in shape and smaller, apices free, bases broadly rounded. Stipule large, quadrifid, segments much laciniate-ciliate: ciliæ long, flexuous, pellucid, jointed (as in *G. chlorophylla*). On the stem, between dorsal and ventral lobes, are two transverse lateral rows of finely laciniated processes or leaflets.

Hab. Among other *Hepaticæ* and mosses on prostrate trees, wet forests near Norsewood, County of Waipawa; 1885: W.C.

Obs. A fine species, having close affinity with the preceding, *G. heterocolpos*, in its additional stem-leaflets (which, however, are longer, narrower, more numerous, and differently situated), but widely differing in its compound ciliated stipules, etc.

6. *G. chlorophylla*,³⁶ sp. nov.

Plant very small, under $\frac{1}{2}$ inch long, obovate-oblong, broadest at tip, very obtuse, simple, and 2–4 branched from near base. Leaves closely imbricated, pale green, whitish tipped, oblong, obtuse, margins irregular and sub-laciniate, much ciliated, each lacinia ending in a long cilia; ciliæ all jointed; dorsal lobe similar, but much smaller; cells orbicular. Stipules broadly cuneate, or sub-quadrata-flabelliform, laciniate-lobed, each lobe ending in two large ciliæ: sinus broad.

Hab. On rotten logs, watercourse; deep forest near Norsewood, County of Waipawa; 1883–85: W.C.

36 *Schistochila ciliata* (Mitt.) Steph.

Obs. A species near to *G. ciliata*, Mitt., but differing in its laciniate stipules and leaves, smaller dorsal lobes, and much smaller size. It has a very hoary appearance on both sides, from its pale colour and long ciliæ. It is apparently scarce, having only very sparingly been met with.

7. *G. bicolor*,³⁷ sp. nov.

Plant densely gregarious in large patches, simple, broadly obovate, 4–6 lines long, 2 lines broad at tips. Leaves light-green below, bright yellow-green above, sub-imbricate, spreading, sub-falcate, finely laciniate-serrate, especially at tips; dorsal lobes upper margins entire, rounded and broad at base, and overlapping on stem; tips truncate and minutely serrulate; cells sub-quadratae and oblong. Stipules sub-quadratae, bi-lobed [241] to base, sinus sub-orbicular, lobes laciniate, divergent at base connivent above.

Hab. On rotten logs, dense wet forests near Norsewood, County of Waipawa; 1885: W.C.

Obs. A small species, having some affinity with *G. lætevirens*, mihi (*supra*), but differing in its leaves and stipules, also in size and colour.

8. *G. pallescens*,³⁸ sp. nov.

Plant small, scattered, prostrate, simple, and shortly two-branched, broadly obovate, 3–5 lines long, 3 lines broad and much rounded at top, flattish, stems rather stout, with many pink rootlets below, at and near base. Leaves very

37 *Schistochila repleta* (Hook f. & Taylor) Steph.

38 *Schistochila repleta* (Hook.f. & Taylor) Steph.

pale or yellowish-white, close, compact, spreading, sub-ovate-oblong, acute, sub-laciniate-serrate throughout, overlapping at base; dorsal lobes similar, but much smaller, tips somewhat truncate and serrulate; cells orbicular, cell-walls very thick. Stipules very large, sub-quadratae, but broadest at top, bi-lobed (almost quadrifid); sinus open, lobes much laciniatae and largely divergent above.

Hab. On rotten logs, among other small *Hepaticæ*; wet shaded woods, Seventy-mile Bush, County of Waipawa; 1883: W.C.

Obs. A species near to *G. bicolor*, mihi (*supra*), but differing from it in its larger spreading stipules, and in being much more laciniatae, also in colour, form, and habit.

9. *G. marginata*,³⁹ sp. nov.

Plant prostrate, creeping, simple, sometimes branched below 1–1½ inches long, 4 lines wide, broadest at top, green; stem stout, succulent, with many brown rootlets at base. Leaves close above, distant below, sub-oblong-ovatae, rather obtuse, sub-falcatae, spreading, laminæ with several small plaits or creases, largely serratae at apex, coarsely laciniatae at base; dorsal lobe very broad, rounded, and overlapping below, with the margin entire, or nearly so, truncate and serratae at tip; cells oblong, large, stipules rather large, sub-ovatae-quadratae, bifid to middle, each segment once lobed on the outside and laciniatae; laciniæ few and rather distant, triangular, acute, not capillary nor ciliate, and all many-celled throughout;

39 *Schistochila repleta* (Hook.f. & Taylor) Steph.

cells large; main sinuses orbicular, with their margins thickened as if doubled or bordered. Capsule (immature) cylindrical, narrow-linear, 3 lines long, dark-purple; fruit-stalk sub-clavate at top, but contracted at junction with capsule.

Hab. On trunks of fern-trees, wet shaded forests near Norsewood, County of Waipawa, 1885: W.C.

Obs. A species having close affinity with *G. pallescens*, mihi (*supra*). [242]

10. *G. albistipula*,⁴⁰ sp. nov.

Plant small, bright light-green; stems sub-erect, simple, 1–1¼ inches long, obovate-oblong, truncate at tip, 4 lines wide in the broadest part, leaved to base; stem stout, succulent, white, with fine filiform rich purple rootlets at base. Leaves thin, closely imbricate, spreading, falcate, ovate-oblong, obtuse (sometimes with a tooth as a mucro), each with 3–4 narrow plaits or creases extending diagonally to margin, the margins of the upper half coarsely serrulate, the lower half of basal margin nearly entire, the upper half of the same laciniate; laciniæ increasing in size towards the stem, and there shortly decurrent; dorsal lobe much broader at base than the ventral, and largely rounded and overlapping the stem, the margin very slightly serrulate and decurved, the apical portion truncate; cells sub-orbicular, rather small. Stipules white, rather large, sub-quadrangular, narrowest at base, bi-lobed to middle, sinus large, with two minute laciniæ; lobes broad at top, coarsely laciniate, not ciliate; laciniæ obtuse, celled to apices; cells of various shapes

40 *Schistochila repleta* (Hook.f. & Taylor) Steph.

and sizes, mostly orbicular-oblong, large, clear, and double-walled. Fruit-stalk 15 lines long, stout. Capsule narrow, linear-oblong, purple; valves spreading, 2 lines long, linear-lanceolate, very obtuse, not meeting at base, but with a small hemispherical pilose boss in the centre, finely and closely striate longitudinally and transversely with minute dark-brown striae. Spores orbicular, numerous; no spiral elaters detected.

Hab. On rotten logs and on the earth, forming compact patches in shaded spots; wet woods, near Norsewood, County of Waipawa, 1885: W.C.

Obs. A species nearly allied to *G. macroamphigastra*, mihi (*supra*), but differing in its being unbranched, with much less concave leaves, that are also largely plaited, and in its very much smaller and differently-formed white stipules.

** Stipules 0.

11. *G. simplex*,⁴¹ sp. nov.

Plant small, sub-gregarious, simple and sparingly branched, under 1 inch long, 3 lines broad, sub-ovoblate-linear, very light-green, of a soft texture. Leaves below distant, narrow-oblong, obtuse, and nearly quite entire; the upper not crowded, linear-ovate, slightly and finely serrulate, more so at tips; dorsal small, scarcely half as long as the ventral, sub-elongate-quadrata, upper edge slightly curved, truncate at apices, margins entire; cells small, sub-orbicular; rootlets numerous, long, purple; stipules 0.

41 *Schistochila unguicularis* (Hook.f. & Taylor.) Steph.

Hab. On the ground, among other *Hepaticæ* and mosses; banks of the River Mangatawhaiiti, between Norsewood and Danneverke, County of Waipawa; 1885: W.C. [243]

Obs. A curious little naked species, without stipules, and with margins nearly entire, and therefore having affinity with *G. tuloides*, Hook. fil. and Taylor, another New Zealand species formerly discovered by myself; also pretty near to two preceding species (in this paper), *G. læte-virens* and *G. nitida*, from the same forests.

12. *G. ramulosa*,⁴² sp. nov.

Plant creeping, prostrate, ascending, stem 1–1½ inches long, 4 lines broad, linear, obtuse, flattish, thickly rooting below on lower part of stem, much branched with several short branchlets at tops. Leaves numerous, and very closely set from base, somewhat inflated, spreading, stem-clasping, pale-green; ventral ovate-oblong, acute and finely serrulate at tips; upper margin rounded, lower nearly straight, both margins entire and slightly recurved; dorsal lobes similar, but much smaller, sharply acuminate at upper angle of tip; cells orbicular, small; stipules 0. Involucral long narrow acuminate and much laciniate-serrate. Fruit-stalk short, shorter than involucral leaves; capsule broadly ovate, red-brown.

Hab. On bark of trees, among other *Hepaticæ* and mosses, spreading in small patches, but apparently very local and scarce; forest between Norsewood and Danneverke, County of Waipawa; 1883: W.C.

Obs. A species having some affinity with *G. tuloides*, Hook. fil. and Taylor, and with *G. simplex*, mihi (*supra*), from its not possessing stipules, and its nearly entire leaves.

Genus 9. *Psiloclada*, Mitten.

1. *P. digitata*,⁴³ sp. nov.

Plant minute, procumbent, very membranaceous. Stems 1–2 inches long, very slender, pinnately branched, with fine rootlets at tips. Leaves pale-green, microscopical, rather close set, sub-quadratae in outline, patent, those on main branches much broader than their stems, 3–4 lobed, the blade as long as or longer than the lobes, and appearing as if 5–7 nerved; lobes subulate, spreading, with the apparent “nerves” continued into them; cells large, regular, oblong or sub-quadratae, extending to tips of lobes. Stipules similar, but much smaller and adpressed. Fruit, etc., not seen.

Hab. Damp shady woods, among other *Hepaticæ* and mosses, near Norsewood, County of Waipawa; 1885: W.C.

Obs. The cells of this little plant somewhat resemble those of *Lepidozia patentissima*, only they are more regularly disposed in lines among the apparent “nerves.” Some of the long capillary branchlets have also the appearance of fine rootlets at their tips, as in some *Lepidozia*. The 4-lobed leaves, with their [244] dark and straight lines of “nerves,” bear a close resemblance to the back of a gloved hand. It is a beautiful little plant, having

43 *Stet.*

a strong resemblance in habit, form, and texture to the only other (known) species, *P. clandestina*, Mitt.; but, from the absence of fruit, it is somewhat doubtful as to genus. At present the plant is scarce, only two specimens having been detected; from its minuteness, however, it is easily overlooked.

Genus 13. Lepidozia, Nees.

1. *L. concinna*,⁴⁴ sp. nov.

Plant largely and loosely tufted, branched, procumbent, overlapping, pale-green, 2–3-pinnate; branches 1–2 inches long, 4–5 lines wide, sub-oblong-lanceolate; branchlets 2–2½ lines long, widely apart, alternate, decurved, the shorter ones broad and rounded, and the longer ones capillary at tips. Leaves many, closely set and sub-imbricate on branchlets, more distant on main stems, patent, slightly incurved, sub-quadrata, 3–4-fid; cells strongly defined and numerous, large in the centre at base of leaf. Stipules small, quadrate, 4-cleft to middle, patent; segments subulate, acute, spreading, sinus wide, round at base; cells of segments in 3–4 rows, very minute, distinct, regular.

Hab. On living trees, forming thick and large patches; wet forests near Norsewood, County of Waipawa, 1885: W.C.

Obs. An elegant species, allied to two of the known New Zealand ones, *L. microphylla*, and *L. pendulina*, Lind.; also to the following one, *L. cancellata*, mihi; and also to *L. chordulifera*, Tayl., a species of the Chonos

Archipelago. The leaves in shape and in cell-areolæ are somewhat like those of *L. procera*, Mitt., a Tasmanian species, but the plant is widely different.

2. *L. cancellata*,⁴⁵ sp. nov.

Plant largely and loosely tufted, of a pleasing green; branches 1½ inches long, 3 lines broad, linear-lanceolate, rarely branched at base, sub-procumbent, loosely overlapping, bi-pinnate; branchlets numerous, alternate, rather closely set, short, 1–1½ lines long, very rarely again branched, tips sometimes capillary, and then exceedingly fine and reddish. Leaves large, sub-oblong-quadrata, 4-fid, cancellate, very close, incurved (presenting a sub-vermicillate appearance), those on the main stem more distant and very large; cells large; segments very long, curved and spreading, subulate, acute, each with a single row of cells; sinus large, round. Stipules similar but smaller, distant, patent.

Hab. On trees and logs, forming large and thick patches; forests near Norsewood, County of Waipawa, 1885: W.C.

Obs. A species very near the preceding (*L. concinna*, mihi), but differing in its more slender and simple branches; in its [245] shorter and closer branchlets that are rarely capillary, and when so, finer than fine hair and coloured; in its larger leaves with larger open cells visible to the naked eye, and in their much longer segments which are also in single-celled rows throughout. A truly elegant plant.

45 *Telaranea tetrapila* var. *cancellata* (Colenso) J.J.Engel & Merrill.

3. *L. subverticillata*,⁴⁶ sp. nov.

Plant small filiform procumbent spreading, closely adhering to rotten wood, much and irregularly branched; light-green. Main branches 2 inches long and more, sub-bi-pinnate, narrow, linear-oblong; branchlets short, alternate, tips occasionally but seldom capillary. Leaves highly cellular, close set, overlapping (having a sub-verticillate appearance), sub-oblong-quadrata, 3- (sometimes 4-) fid; lamina very short, scarcely any; segments very long, articulate, incurved. Stipules similar, but smaller and more distant. Perianth terminal on short lateral branchlets (sometimes two close together), very large for the plant, cylindrical, 2 lines long, vertical, largely ciliate at tips with 6–9 long flexuous ciliæ; cells large, narrow-oblong; involucral leaves large, cellular, sub-broadly-ovate, tips slightly laciniate.

Hab. On rotten logs, forming small thick patches; in wet forests near Norsewood, County of Waipawa; 1885: W.C.

Obs. A very neat little species of a pleasing green colour; its affinities are with *L. capillaris*, Lind.

4. *L. minuta*,⁴⁷ sp. nov.

Plant minute, prostrate and creeping, wiry, irregularly branched, pale-green, with long white capillary pellucid radicles below. Main branches about 1 inch long, with many capillary branchlets $\frac{1}{2}$ – $\frac{3}{4}$ inch long. Leaves rather

46 *Telaranea lindenbergii* (Gottsche) J.J.Engel & Merrill var.
lindenbergii.

47 *Lepidozia laevifolia* (Hook. f. & Taylor) Gottsche, Lindenb. &
Nees.

small, close set, and sub-imbricate, patent, quadrate, 4-dentate, larger and more distant on the main branches; lamina large; teeth short, broadly-triangular, acute, incurved; cells small, sub-orbicular, distinct, much larger in the centre of leaf. Stipules minute, distant, similar to leaves but much smaller, 3–4-toothed. Perianth lateral, sub-sessile on main stems; involucral leaves rather large, oblong-ovate, slightly laciniate; cells large.

Hab. Among mosses and small *Hepaticæ*, on decaying logs; wet woods near Norsewood, County of Waipawa; 1885: W.C.

Obs. A species having close affinity with *L. laevifolia*, Lind.

Genus 14. *Mastigobryum*, Nees.

1. *M. concinnum*,⁴⁸ sp. nov.

Plant a pleasing light-green, densely and regularly tufted, shortly creeping, imbricate; stems $\frac{3}{4}$ – $1\frac{1}{2}$ inches long, dichotomous; branches $\frac{1}{2}$ inch long, linear, $1\frac{1}{2}$ lines wide, obtuse, divergent, sending down long scaly and hairy rootlets; young branches and rootlets highly cellular. Leaves close, distichous, [246] spreading, imbricate at base, flat, falcate, sub-ovate-oblong, truncate, 3-toothed; teeth acute; dorsal margin curved, ventral straight; cells orbicular, small and distinct at apex, larger and very compact at base; young leaves with compact sub-quadrata cells. Stipules rather large, free, sub-quadrata, usually 6- (sometimes 4- and 8-) toothed; teeth small, blunt; cells smaller than in leaves and more

48 *Bazzania hochstetteri* (Reicht.) E.A.Hodgs.

distinct (very much like those of *M. novæ-zealandiæ*, Mitt.). Fruit not seen.

Hab. Forests near Norsewood, closely overlying mosses (particularly tufts of *Leucobryum candidum*, and killing them); 1885: W.C.

Obs. A very pretty species, having affinity with *M. taylorianum*, Mitt., and *M. monilinerve*, Nees.

2. *M. delicatulum*,⁴⁹ sp. nov.

Plant small, procumbent, creeping; stems $\frac{1}{2}$ – $1\frac{1}{2}$ inches long, less (with leaves) than $\frac{1}{2}$ line wide, dichotomous, having a jointed appearance. Leaves minute, pinnate, pale-green, somewhat thickish and opaque, free, rarely laxly imbricate, slightly convex, obliquely oblong-quadratae, sub-falcate, spreading, truncate at tips and coarsely 3-dentate, dorsal margin arched, ventral straight; cells minute, annular, distinct in parallel lines alike throughout (much as in *M. novæ-zealandiæ*). Stipules free, small, very membranaceous, light-reddish-brown, sub-quadratae, 3–5-fid; segments straight or slightly curved; cells large. Flagellæ few and short. Fruit not seen.

Hab. On trunks of tree-ferns, shaded wet woods near Norsewood, County of Waipawa; 1885: W.C.

Obs.—A peculiar finely-cut soft and delicate-looking plant, forming close and thickish patches through continuously overgrowing; having pretty close affinity with *M. taylorianum*, but differing in its free leaves with orbicular separate cells that are alike throughout, and in

49 *Bazzania tayloriana* (Mitt) Kuntze.

its quadrate laciniate membranaceous stipules. I have not yet found it in fruit; and for a long time I had supposed it might prove to be a species of *Lophocolea*, owing to its being barren and my not meeting with a single imbricating branchlet.

3. *M. quadratum*,⁵⁰ sp. nov.

Plant small, tufted, sub-erect; stems $\frac{3}{4}$ –1 inch long, once forked, and loosely dichotomously branched; grass-green. Leaves close, laxly imbricate at bases, pinnate, falcate, sub-oblong-quadrata, broadest at base, lateral margins slightly uneven or sub-sinuate-dentate, the upper one much arched, the lower straight, short, tip truncate and 3-dentate; teeth large, acute, cellular; cells small, orbicular, larger and oblong-orbicular in centre of leaf. Stipules free, large, quadrate, emarginate, toothed on three sides but most so at top, reddish-tipped. Flagellæ numerous, slender, short. [247]

Hab. Among mosses, etc., on prostrate rotten trunks, damp woods near Norsewood, County of Waipawa; 1885: W.C.

Obs. A species having pretty close affinity with the two preceding, and presenting a similar appearance; but widely differing in form of stipules, etc.

50 *Bazzania hochstetteri* (Reichardt) E.A. Hodgs.

4. *M. fugax*,⁵¹ sp. nov.

Plant small, 1–2 inches long; stems procumbent and suberect, straggling, much branched; branches rather distant, long, filiform, few-leaved, naked below. Leaves alternate, obliquely oblong, broadest at base, amplexicaul, $\frac{1}{36}$ th of an inch long, entire, tip broad, very obtuse (sometimes slightly retuse and sub-sinuate), upper margin much arched and very slightly imbricating towards base, the lower straight; pale-green; very fugacious. Cells small, orbicular, with a central longitudinal band of larger ones, increasing in size from apex to near base. Stipules very minute, free, subpalmate, 4-laciniate; nearly all laciniæ subulate and highly cellular.

Hab. On bark of living trees, among other small *Hepaticæ*; wet woods near Norsewood, County of Waipawa; 1885: W.C.

Obs. A small wiry-looking species, having affinity with *M. convexum*, Lind., a Cape of Good Hope species, and also approaching *M. australe*, Lind., a Fijian species. It has rather a ragged look, especially when compared living with the three foregoing New Zealand species; mainly through the easy falling-off of its leaves, which happens with the most careful handling, probably owing to their excessive thinness from the large cells at their bases.

51 *Bazzania convexa* (Thunb.) Trevis.

5. *M. similis*,⁵² sp. nov.

Small, stems about 1 inch long, dichotomous; branchlets short, divergent. Leaves pale-green, somewhat distant, rarely overlapping at base, flat, spreading, obliquely oblong-quadratae, 3- (sometimes 2-) dentate, teeth short, obtuse; dorsal margin much arched, broad and rounded at base, irregularly sinuate towards apex; ventral margin slightly irregularly sinuate; cells small, confused, with a band of larger ones running from base towards apex within the ventral margin. Stipules free, small, sub-quadratae, 4-fid, largely cellular; segments very long and capillary.

Hab. Forests near Norsewood, County of Waipawa; among other small *Hepaticæ*; 1885; W.C.

Obs. A species having close affinity with *M. taylorianum*, Mitt., but differing in its leaves being distant and much broader at their bases, with sub-sinuate margins, and obtuse and short apical teeth, and also in its stipules being sub-quadratae and largely lacinate, with long cellular capillary segments. Only a few broken specimens were found, mixed among other *Hepaticæ*.
[248]

Genus. 24. *Fossombronia*, Raddi.

1. *F. rosulata*,⁵³ sp. nov.

Plant very small, gregarious, creeping at roots, and forming minute mounds, rising in little separate erect rosulate heads very close together, 1½–2 lines high, and

52 *Bazzania hochstetteri* (Reichardt) E. A Hodgs.

53 Not found.

about the same in diameter; stem 0; rootlets numerous, purple, matted. Leaves compact, semi-orbicular, sessile, much waved and crumpled, sub-papillose, margins entire, yellowish-green; cells large, broadly-oblong. Perianth very similar, but much smaller, margins slightly and distantly crenate; marginal cells minute, orbicular. Fruit-stalk stout, erect, 5 lines long. Capsule globular, rather large, reddish-brown, minutely reticulately veined, and sub-papillose on the outside, bursting very irregularly.

Hab. Among other *Hepaticæ* and mosses on damp, shaded, clayey cuttings; sides of highway, near the bridge over the River Mangatawhainui, Seventy-mile Bush, County of Waipawa; 1880–85: W.C.

Obs. A very minute plant, nearly allied to the other two published New Zealand species, *F. pusilla*, Nees, and *F. intestinalis*, Tayl.; and also, though more distinctly, to *F. nigricaulis*, mihi (*infra*). It has been long known to me in a barren state, and although often sought in a fruitful one, has only during the summer of 1884–85 been detected bearing fruit.

2. *F. nigricaulis*,⁵⁴ sp. nov.

Plant procumbent, creeping, 1–1½ inches long, linear, obtuse, largest specimens 3–4 lines broad at top, shortly branched, branches and tips ascending. Stems stout, dark-brownish-black, densely clothed below with thickish dark-red roots. Leaves pale-green, thin, sub-papillose, broadly oblong, somewhat sub-quadrata at apices, much waved and crumpled, those below a little apart and very decurrent on upper side of stem, giving it a sub-pinnatifid

54 Not found.

appearance, those at tips crowded, margins thin, entire; cells large, oblong. Involucral similar but smaller, extending (rosulate) around stem and base of fruit-stalk; cells very large. Fruit-stalk 4–6 lines long; capsule globular, reddish-brown, bursting irregularly; sometimes two together, or near each other on top of stem.

Hab. Clifffy sides of road, near the River Mangatawhainui, Norsewood, County of Waipawa; 1884–85; W.C.

Genus 25. Noteroclada, Taylor.

1. (?) *N. lacunosa*,⁵⁵ sp. nov.

Plant prostrate, appressed, spreading, branched; rootlets small, many, closely adhering to the soil; branches 1–2 inches long, 8–10 lines broad, pinnatifid, midrib stout but obscure sub-succulent, brittle, glabrous; colour a pleasing dark grass-green. [249] Lobes large, 4–5 lines long, 2–3 lines wide, nerveless, not extending to midrib, very close and sub-imbricate, sub-orbicular and broadly elliptic, thin, transparent, finely papillose, studded with pale yellow dots, most so on basal margins; margins entire; the large apical portion of the lobe smooth, flat, and spreading laterally, the basal portion concave with margins raised above midrib, sub-erect, and transversely corrugated almost regularly, thickened and recurved, and having a deeply lacunose appearance; in each posterior axil of those lower cavities on the upper surface is a small cluster of reddish-tipped antheridia (immature)

55 *Treubia lacunosa* (Colenso) Prosk.

with green paraphyses intermixed. Cells of lobes numerous, large, irregular sizes, sub-quadrangular.

Hab. Scattered in small patches on wet shaded banks, sides of streams and watercourses, among other *Hepaticæ*; low woods, Seventy-mile Bush, County of Waipawa, 1880–85: W.C.

Obs. This is a very striking plant, resembling no other known to me among all our numerous endemic plants of this order. Its large size, remarkable fresh and regular semi-ribbed appearance, and dark colour, arrests the eye at once. It has caused me “a world of trouble,” extending over several years, in my endeavouring to obtain it in fruit; hitherto, however, I have failed, although I have diligently visited its marked habitats at all seasons of the year, save mid-winter, when I suspect it bears fruit. Not having detected it in fruit, I am not certain of its proper genus; but of all the known genera of *Hepaticæ* this plant is more closely allied to *Noteroclada*, in which I have provisionally placed it; also, though more distantly, to *Fossombronia*, a cognate genus; from which genus, however, its round leaves or lobes exclude it. It is by no means plentiful, only occurring here and there and at distant spots in single small patches, but always presenting a uniform healthy, strong, flourishing appearance. Having sought it so long and so frequently in the fruiting state, without success, I now make it known in its barren form.

Genus 26. Petalophyllum, Gottsche.

1. *P. macrocalyx*,⁵⁶ sp. nov.

Plant gregarious, minute, 2–3 lines diameter, 1–2 lines high; stem stout, very short scarcely any, dark-red-black, with many fine short red spreading rootlets. Leaves few, sub-rotund, waved and crumpled, margins entire; cells large, sub-quadratae. Perianth large, sub-campanulate, erect, 2 lines long, 1½ lines broad, whitish, margin entire. Fruit-stalk 12–14 lines long, slender, capsule globular, brown, splitting irregularly into four divisions, each sub-cuneate, obtuse, 2–3 lobed.

Hab. Among mosses and small frondose *Hepaticæ*, damp sides perpendicular cuttings on the roadside, Norsewood, County of Waipawa; 1885: W.C. [250]

Obs. A very minute plant, wholly hidden but for its large erect inflated whitish perianth.

Genus 27. Zoopsis, Hook. fil. and Tayl.

1. *Z. flagelliforme*,⁵⁷ sp. nov.

Plant slender, prostrate, glabrous, glistening, light-green; ¾–1½ inches long, 1/40 th of an inch broad, much and dichotomously branched; main branches linear-lanceolate, flexuous, composed of two rows of cells on each side of the central cord, tips flagellate; sides sinuate with sub-rotund or knobbed projections of large blunt cells, sub 3, or so, together, alternate and at almost regular distances, with smaller cells intervening, and a

56 *Stet.*

57 *Zoopsis argentea* var. *flagelliformis* (Colenso) R.M. Schust.

few scattered short and simple rootlets beneath peeping. Involucral scales long, irregular, lanceolate. Perianth large, lateral, pedicelled, highly cellular, almost cancellate, much laciniate; laciniæ long, each composed of two rows of large orbicular cells; also some of a single row of oblong cells; pedicel thick. Fruit-stalk 2 lines long, septate, cellules large and full of scattered dark dots; capsule light brown, oblong; valves oblong-lanceolate, obtuse, excessively reticulated with dark veins, the longitudinal ones thick and wavy.

Hab. Among other *Hepaticæ* on decaying logs; wet forests, Norsewood, County of Waipawa; 1885: W.C. (Same localities; October, 1885: W.C.)

Obs. A species having pretty close affinity with the only other known (published) species of this genus, *Z. argentea*, Hook. fil. and Tayl., but differing from that species in its larger size yet narrower; in being much branched, with flagellate tips; in shape, and in colour, and in the number, form, and position of its cells. A truly elegant object under a misroscope.

2. (?) *Z. lobulata*,⁵⁸ sp. nov.

Plant minute, tufted, glabrous, stems brownish, creeping, 3–4 lines long, dichotomous, sub-bipinnatifid; branchlets or lobes sub-erect, linear, almost filiform, about 1 line high, emarginate, margins entire; cells sub-orbicular, apparently 2–3 nerved; light-green. Perianth lateral near base, short, laciniate, thickish, opaque, brownish-red. Calyptra sessile, sub-ovate, very membranaceous, reticulate, bearing a small reddish cellular boss or umbo

58 *Riccardia lobulata* (Colenso) E.A. Hodgs.

on the top, which is persistent. Capsule shortly pedicelled, oblong, on a short, thickened, linear-oblong (or apophysate) stem, striate, bursting at tip, mouth conniving. Spores green, orbicular, trilobed. Elaters long, pointed and spiral, remaining fixed in an irregularly pencilled mass at mouth.

Hab. On denuded rotten logs, in large continuous patches; shaded wet forests, near Norsewood, County of Waipawa; 1885: W.C. [251]

Obs. It is with some doubt that I place this new, curious, and interesting little plant under *Zoopsis*, as it possesses some only of its characters. Sir J.D. Hooker had only seen “immature fruit” of the one species on which he established that genus. This plant, however, is very distinct from that one, and also from *Z. flagelliforme*, mihi (*supra*), and may yet become the type of another genus.

Genus 30. *Symphyogyna*, Mont. and Nees.

1. *S. brevicaulis*,⁵⁹ sp. nov.

Plant epiphytical, closely gregarious, pendulous and imbricated in growth, rhizome creeping, rough, spongy, light-brown, villous. Frond light grass-green, glabrous, mostly simple, linear-oblong, about $\frac{1}{2}$ inch long, 1–2 lines wide, sometimes but rarely forked, much waved, margins entire, tips retuse, broad at base and shortly decurrent or truncate, midrib thick; stipe very short, with fine red hairy rootlets at base; cells large, of various sizes, sub-quadrata. Involucra central, sometimes 2–3 on

59 Not found.

a single frond, and when the frond is forked not at the forking, small, deeply laciniate, laciniæ very narrow. Calyptra long, tubular, sub-clavate, striate, rather loose and sub-plaited, lips entire, bearing a few scattered reddish pistillidia. Fruit-stalk short, often two very near each other. Capsule 1 line long, cylindric, obtuse, finely striate, purple-black; spores circular, dark purple-brown; elaters very numerous, long, bi-spiral, flexuous.

Hab. Clothing the stem of a fern tree (*Dicksonia squarrosa*), in a deep-shaded forest near Norsewood, County of Waipawa; 1884–85: W.C.

Obs. A species near to *S. sub-simplex*, Mitten, and to *S. simplex*, Colenso, ("Trans. N.Z. Inst.", vol. xvi., p. 352,) especially in its barren fronds, but very distinct in its characters.

Genus 32. *Aneura*, Dumort.

1. *A. muscoides*,⁶⁰ sp. nov.

Plant light-green, in dense, small-moss-like effigurate sub-circular patches, 5–6 inches diameter; excessively compact and uniform. Fronds minute, erect, sub $\frac{1}{2}$ inch high, simple, rarely forked, compressed, linear-cuneate, under $\frac{1}{2}$ line wide, broadest at tip, margins sinuate, and very shortly and sparingly lobed or knobbed; tip 1–2 notched, or truncate; green above at apex, white below at base.

60 *Riccardia muscoides* (Colenso) E.A. Hodgs.

Hab. Sides of wet cliffs, and closely adhering to them; River Mangatawhainui, near Norsewood, County of Waipawa; October, 1884: W.C.

Obs. This little plant wears a most peculiar appearance, more like a thick patch of densely growing *Conferva*, or a piece of green plush cloth! Although presenting such a close rigid [252] aspect, and when gathered with unbroken base it adheres closely together, yet on the basis being cut it falls directly into separate fibrils or fronds. Growing with it and scattered among it, and just as closely compacted and regular in height, is another small *Hepatica*, *Gymnomitrium orbiculata*, mihi (*supra*).

2. *A. pellucida*,⁶¹ sp. nov.

Plant low, creeping, forming large, compact, small-moss-like patches on branches of living trees, densely imbricate, regular in height and in general appearance, 3–4 lines high, bi-tripinnatifid, rather thickish, succulent, very fragile, bright emerald-green, shining; main branches concealed, flat, broad, adhering strongly by many minute rootlets; branchlets opposite, sub-erect, sub-palmate, many lobed; lobes short, broadly linear, entire, obtuse and emarginate, the broadest minutely crenulate at tip, sub-pellucid; cells large, sub-orbicular, very close, apparently disposed in a double layer and beaded. Calyptra cylindrical, 1½ lines long, white, transparent, rugose; cells large and oblong, also having a beaded appearance. Seta very slender, weak, hyaline, shining, ½ inch long. Capsule, valves linear, acute, spreading, finely striate longitudinally; pencils of elaters

61 *Stet.*

at tips patent with a sub-rigid appearance, bi-spiral, acicular at tips.

Hab. On branches of living trees; wet shady woods, near Norsewood, County of Waipawa; 1876–1885: W.C.

Obs. A small, low, spreading, mossy-looking plant of a lively green colour, not unfrequently met with on the branches of the smaller forest trees with smooth bark, (as *Melicytus*, the larger species of *Coprosma*, *Weinmannia*, etc.,) in wet shaded woods, but rarely ever found in fruit. Indeed, I never detected any fruiting specimens until this autumn (April, 1885). It is altogether a charming object under a microscope from its transparency, the apparent regularity of its growth, in the length, height, and direction of its minute fronds, (all, too, severally more or less irregular,) is very remarkable. It has close natural affinity with the following species, *A. crispa*.

3. *A. crispa*,⁶² sp. nov.

Plant prostrate, spreading in effuse dense patches, 4–5 inches long; 2–3 pinnatifid, closely imbricate, dark-green. Fronds or lobes about $\frac{1}{4}$ inch high, sub-erect, ascending, much cut and irregularly lacinate; calyptra white, sub-clavate, tubercled, erect and curved, 2 lines long, rising above the plant, and so presenting a novel appearance; fruit-stalk very slender; capsule rather long, linear-oblong; valves narrow, bearing elaters largely at their tips.

Hab. On rotten logs, shaded and damp spots, base of high cliffs, banks of River Mangatawhainui, near Norsewood, County of Waipawa; October, 1884: W.C. [253]

4. *A. epibrya*,⁶³ sp. nov.

Plant thickish, brittle, softish, light-green, mostly composed of single irregular-shaped sub-erect fronds, that are sometimes forked and slightly branched or lobed, and sometimes overlapping, 1–1½ inches long, 3–4 lines wide, broken below, arising from a decaying base.

Fronds sub-solitary, linear-oblong, expanded and rounded at tips, waved, rumpled, and incurved, margins entire, thin, slightly and irregularly crenulate, usually more so at tips; semi-transparent when fresh, largely so when dried, with short, yellow, silky hyaline rootlets below, by which it adheres strongly to its supporting moss; cells obscure. Calyptra stout, erect, 3½ lines long, green, bristly and rough, with short patent hairs.

Hab. Epiphytical on *Hypnum aciculare*, dry shaded declivities, *Fagus* forests near Norsewood, County of Waipawa; 1883–85: W.C.

Obs. A peculiar species, confined (as far as I have observed) to this one species of large, erect and very dry moss, which it sometimes kills; its fronds are of vigorous growth, but are almost invariably rotten at their bases. In its strange habitat (for a plant of this genus that delights in low, wet and shaded localities,) it is plentiful, though always scattered, from its so early decaying at base. It is

allied to *A. biflora*, Col.,⁶⁴ which species is also epiphytical on living moss (*Hookeria*), but that moss is only found in wet, dark shaded localities, and is also sub-succulent.

5. *A. marginata*,⁶⁵ sp. nov.

Plant small; main stems creeping, prostrate, dark red-brown; branches generally simple, sometimes forked, erect, densely tufted, 3–4 lines high, linear, sub-clavate, occasionally somewhat palmate, margined; margins entire, sometimes (but rarely) slightly denticulate and sub-lobed, tips emarginate; succulent, sub-rigid; green. Cells large, sub-orbicular, sparsely beaded, those of margin small and very regular. Fruit single at base of lobe below. Calyptra cylindrical, erect, 1½ lines long, sparingly tubercled below, more so above, and crowned with a boss of tubercles; tubercles red, obtuse, cellular. Capsule oblong, dark-blue.

Hab. On rotten logs in low wet woods, forming close and large patches; forests near Norsewood, County of Waipawa; 1885: W.C.

6. *A. nitida*,⁶⁶ sp. nov.

Plant minute, creeping, imbricate, reclinate, densely tufted, crisp and brittle, of irregular growth; yellowish-white. Base stems, or main branch of frond, broad, flat, strongly adhering, [254] glistening, having a varnished appearance; branches very short, broad, irregular, sub-

64 WC: Vide "Trans. N.Z. Inst.," vol. xvii., p. 262.

65 *Riccardia marginata* (Colenso) Pearson.

66 *Riccardia nitida* (Colenso) E.A. Hodgs.

flabellate, lacinate and deeply lobed; lobes about 1 line long, sub-erect, secund, linear, entire, sometimes slightly sub-denticulate, spreading; tips obtuse. Cells rather large, oblong, numerously beaded. Fruit-stalk lateral at sinus of lobes, single, sometimes 2–4 on a branchlet; involucral scales 2–4, small, broad, acute and spreading. Calyptra white, slender, 1 line long, very sparsely tubercled throughout; tubercles very fine almost hairs, white. Capsule very narrow, linear-oblong, slender.

Hab. In low wet woods near Norsewood, County of Waipawa; 1885: W.C. On rotten logs forming large yellow patches, adhering very strongly as if gummed on; difficult to separate even when long steeped in water.

Obs. A species similar to the preceding, *A. marginata*, but differing in colour, habit of growth, not being margined, cells oblong and confused; calyptra white, more slender, and not coarsely and red tubercled; and the main stems broad, flat, and glassy.

7. *A. punctata*,⁶⁷ sp. nov.

Frond small, greenish-white, thickish, sub-erect, 3–6 lines high, effuse, usually somewhat broadly palmate, spreading, much branched and lobed; branches very short, sub-pinnatifid or lobed, retuse, irregular; cells oblong, large. Calyptra erect, 1 line long, cylindrical, sub-clavate, contracted at mouth, white, smooth, cellular, sub-transparent; cells linear-oblong, minutely beaded with round dark dots. Fruit-stalk slender, $\frac{1}{2}$ inch long, hyaline, transversely septate. Capsule rather small, oblong, dark purple-brown, finely striate, closely and

67 *Stet.*

minutely transversely barred or dotted with black, valves obtuse, margined; elaters long, bi-spiral with acute tips; spores circular.

Hab. Among other *Hepaticæ* on rotten logs, forming thick little patches, wet woods near Norsewood, County of Waipawa; 1885: W.C.

Genus 39. *Anthoceros*, Micheli.

1. *A. granulata*,⁶⁸ sp. nov.

Plant prostrate, spreading in effuse patches, 5–6 inches long, closely adhering by its numerous fine hair-like rootlets, densely imbricate, light-green, and covered with masses of fine sparkling granules, as if frosted (or like soredia in some species of *Parmelia*); lobes at first very small and irregular, large and concave in age, with rounded crenulate margins. Calyptra conical, thick and sub-globose at base, and slightly tubercled; peduncle $\frac{1}{2}$ – $\frac{3}{4}$ inch long, erect, green; capsule $\frac{3}{4}$ inch long, dehiscing to base at one side only, brown; valves flexuous, broad and flat; columella very slender. [255]

Hab. On rotten logs, growing with *Aneura crispa* (*ante*), shady bases of cliffs, River Mangatawhainui, near Norsewood, County of Waipawa; November, 1884: W.C.

Obs. Before fruiting the fronds are very soft, and are then easily mistaken for some other allied frondose genus of *Hepaticæ*.

68 Not found. “*Anthoceros granulatus*” had been used earlier.

2. *A. membranaceus*,⁶⁹ sp. nov.

Plant prostrate, spreading in small irregular patches, sub-imbricate, green. Lobes variously shaped, mostly obovate-oblong, 4–8 lines long, sub-pinnatifid; lobules rounded very much and finely cut (sub-laciniate-fimbriate), very thin, abounding in reticulate cells under a lens. Calyptra conical, roughish, green below, brownish at tip, 3 lines long; peduncle slender, green, 6–8 lines long; capsule about $\frac{1}{2}$ inch long, very slender, light-brown, diverging at tips; valves separate to base; columella very filiform, flexuous; spores orbicular, muricated; elaters flexuous, bi-spiral.

Hab. On logs in wet dark woods, near Norsewood, County of Waipawa, growing underneath large *Aneura*, &c.; November, 1884: W.C.

Obs. A species remarkable for the smallness of its fronds, and the number of its fruit-stalks, the fine hair-like slenderness of its receptacle, and the light-red colour of its capsule.

3. *A. pusilla*,⁷⁰ sp. nov.

Plant very small, densely gregarious in effuse patches of 3–4 inches, erect, glabrous. Fronds 3–4 lines high, 2–2½ lines wide at top, broadly cuneate and sub-fan-shaped, lobed, laciniate; upper margin crenulate and crisped, thickish, succulent, pellucid; apical portion light-green; pale below, covered with scattered minute green specks, and a few small white rootlets near the base; cells large.

69 *Megaceros membranaceous* (Colenso) E.A. Hodgs.

70 Not found. “*Anthoceros pusillus*” was used later.

Calyptræ 1–2–3 on a frond, rising from the centre, cylindrical, 2 lines long, bulbous at base, smooth, entire at margins; capsule 3–4 lines long, slender, green; tips black. Gemmæ scattered in substance of frond, in rather large dark coloured elliptic bodies.

Hab. Among mosses and *Hepaticæ*, bases, wet sides of steep clayey cuttings, public roads; Seventy-mile Bush, County of Waipawa, 1885: W.C.

Obs. A species having some affinity with *A. muscoides*, mihi (“Trans. N.Z Inst.” vol. xvi., p. 361), but smaller, with fewer and very much shorter capsules, etc.

“Qui quo destinavit vult, unam sequatur viam, non per multas vagetur.—Non ire istud, sed errare est.”

(SENECA, *Epist.* xlv.)⁷¹

71 Anyone who wants to arrive at his destination will travel a single path and not many. That is not travelling! It is wandering aimlessly. Seneca.

**1885 A Description of some newly-discovered
and rare Indigenous Plants: being a further
Contribution towards the making known the
Botany of New Zealand.**

Transactions of the New Zealand Institute 18: 256-
287.

[Read before the Hawke's Bay Philosophical Institute,
14th December, 1885.]

Class I. DICOTYLEDONS.

ORDER I.⁷² RANUNCULACEÆ.

Genus 3. Ranunculus, Linn.

1. *R. ruahinicus*,⁷³ sp. nov.

Erect, stout, 2 feet high, paniculately branched, many flowered, thickly pilosely-villous, light-green with a yellowish tinge; hairs mostly short, pale reddish-brown. Leaves orbicular, 4½–5½ inches broad, coriaceous, upper surface slightly hairy, with long strigillose hairs; under surface much more hairy, the hairs shorter, and springing singly from pits or minute depressions in the lamina, but long and thick on the veins; 10–12 ribbed, ribs extending to margin, stout, prominent below; much reticulately veined; margins crenately-serrate (usually 1 broad crenature and 1 smaller and more acute one), each with a small dark-brown raised point or knob at the apex end of

72 WC: The numbers in this paper attached to both Orders and genera, are those of the "Handbook of the New Zealand Flora."

73 *Ranunculus insignis* Hook.f.

a vein; sparingly sub-lobed, lobes 3–4 lines deep and over-lapping; edges thickly ciliate; sinus broad diverging; petiole stout, 4–5 inches long, 3 lines wide, hairy like under-surface of leaf, sheathing at base with a pair of broad membranous stipules. Peduncle stout, 2 lines wide, cylindrical, fistular, with a whorl of three cauline linear-lanceolate sessile bracts, 1½ inches long, 4 lines wide, 3-nerved, thickish, with a few scattered hairs on the upper surface, margins entire and much ciliate; pedicels 4, sub-fasciculate, each 4 inches long, sub-angular, bi-bracteolate about the middle; bracts sessile, linear, 8–9 lines long, diverging. Flowers bright glossy yellow (rather pale, not dark) on the face, paler and dull, with a tinge of green, on the back; 1¼–1½ inches diameter. Sepals 5 (similar in colour to the petals on the back), broadly ovate, ½ inch long, very concave, hairy, strongly and coarsely veined, almost ribbed; 3 principal veins at base soon branching into 8–9 longitudinal ones; tip thickened obtuse emarginate green; margins very thin and largely ciliate. Petals (always) 5, large, broadly cuneate, with scarcely any claw; 7 lines wide at top and about 8 lines long, spreading, wavy, margins reflexed, emarginate, obsoletely nerved (nerves prominent in dried specimens), with one broad stout glandular depression having a ridged margin close to base. Anthers very [257] numerous, rather small, elliptic, obtuse, with a minute connective; stamens somewhat clavate, or with the anther sub-spathulate. Heads small, broadly ovate; receptacle elongated, glabrous, finely papillose. Achenes (immature) long, narrow, subulate, erect, slightly hairy below; style scarcely recurved, glabrous; tip (stigma) minutely pencilled.

Hab. On spurs of the east slopes of the Ruahine mountain range, County of Waipawa; November, 1885: *Mr. H. Hill.*

Obs. A fine and striking species, but closely allied to *R. insignis*, Hook. fil.; differing, however, in its smaller size; orbicular strigillose leaves; larger, ribbed, and ciliated sepals; fewer, deeply emarginate, broader and rumpled petals; and especially in their possessing but a single glandular depression—*R. insignis* having more (2, “Flora N.Z.” 3,⁷⁴ “Handbook” ditto); on which grave characteristic stress is also laid—and also in the form and construction of the anthers. It is, however, worthy of note, that *R. insignis* is a denizen of the higher summits of this mountain range (where it was originally discovered by me), while this plant is found on the lower spurs of the same range.

ORDER VI. CARYOPHYLLEÆ.

Genus 2. *Stellaria*, Linn.

1. *S. oligosperma*,⁷⁵ sp. nov.

A slender prostrate rambling flaccid creeping and glabrous herb, 1 foot or more long, growing in pretty large entangled patches of many feet, rooting from its nodes. Leaves few, distant, opposite in pairs, very thin, light-green, orbicular, 2–2½ lines diameter, with intra-

74 WC: Can this “3” be an overlooked “printer’s error”? as two only are shown in the admirable plate in “Flora Novæ Zelandiæ,” and also twice repeated in the description.

75 *Stellaria parviflora* Hook.f.

marginal parallel vein, apiculate, petioles slender, longer than leaves, with a few weak hairs. Peduncles axillary, much longer than leaves, patent, two-flowered; pedicels 4–6 lines long, unequal in length though springing from the same base, erect and divergent at right angles with a pair of bracts at their base, and another pair below the middle of the longer pedicel; bracts ovate-acuminate, scarious with a dark central line. Flowers 1½ lines diameter; sepals 5, ovate-acuminate, 1-nerved with white scarious margins; petals 5 divided to base, each lobe linear-spathulate; stamens usually 9; styles 3, large, flexuous; capsule twice the length of sepals, very membranous, white, 6-valved nearly to base, valves reflexed; seeds few and large, usually 6, sometimes fewer, orbicular, turgid, with a notch, bright cinnamon-coloured when first ripe, becoming dark-brown with age, finely and regularly marked somewhat concentrically, not pitted. [258]

Hab. In shaded forests, near Norsewood, County of Waipawa; 1883–85: *W.C.*

Obs. A species having pretty close affinity with *S. parviflora*, Banks and Sol., which it resembles in habit, but differing in several particulars.

ORDER XVII. STACKHOUSIEÆ.

Genus 1. *Stackhousia*, Smith.

1. *S. uniflora*,⁷⁶ sp. nov.

76 *Stackhousia minima* Hook.f.

Plant small, glabrous; stems creeping underground; branchlets numerous, slender, sub-angular, erect, loosely branched, light-green, with reddish striate lines, 1–2 inches high; leaves small, few, distant, 6–10 on a main branch, linear-ovate and broadly-lanceolate, $1\frac{1}{2}$ – $2\frac{1}{2}$ lines long, acute and sub-apiculate, thickish, nerveless, green with reddish margins, sub-petiolate with minute stipellæ. Flowers terminal, solitary, conspicuous, rather large for the plant, peduncled with one small foliaceous bract at base; calyx lobes adpressed, deltoid, serrulate and very acute; corolla 2– $2\frac{1}{2}$ lines long, yellowish-brown, speckled and striped with red (as also the calyx), tube united nearly to base, lobes more dusky and dark spotted, linear-lanceolate, acute, 1 line long, spreading, sub-revolute; anthers glabrous, oblong, sub-acute, cordate, orange; stigma trifid; cocci (immature) 3.

Hab. On open spots, banks of the River Manawatu, County of Waipawa; November, 1884: *Mr. Henry Hill.*

Obs. A species allied to *S. minima*, Hook, fil., our only known New Zealand species, but differing from it in its flowers being always solitary, its adpressed calyx with serrulate lobes, and its glabrous anthers. It is also closely allied to *S. pulvinaris*, Muell., (judging from Bentham's description of that species in his "Flora Australiensis,") an Australian and Tasmanian plant of nearly the same size and habit; which species, however, has crowded leaves almost concealing the flowers, obtuse lobes to the corolla, and small obtuse bracts.

ORDER XVIII. RHAMNEÆ.**Genus 1. Pomaderris, Labill.****1. *P. amœna*, sp. nov.**

Shrub 2–3 feet high, bushy, diffused, much branched, very leafy; stems and branches dark-red-brown; branchlets thickly hirsute-pubescent with patent grey hairs. Leaves numerous, close set, thickish, patent, sub-decurved, 2–3 lines long, linear, obtuse, wholly revolute laterally to midrib; margins entire, meeting, of a pleasing grass-green colour above, and very scabrid (sub-muricate) with white scattered hairs; petioles pubescent, nearly 1 line long, and very striking from their white [259] colour with a yellowish tinge; stipules two or more, half the length of leaves, subulate, erect, grey. Flowers very numerous at tops of branches, in small axillary cymose-panicles of 6–8 flowers, twice the length of leaves; pedicels about 1 line long, each with two scarious brown bracteoles at base. Petals 0. Calyx large, spreading, rotate, white, petaloid, 2 lines diameter, pubescent on outside (with pedicels and peduncle), lobes broadly ovate, reflexed, with a central ridge the whole length above, margins incurved, apices sub-acute, thickened; stamens spreading and inclined, a little longer than the style, brown; anthers oblong, obtuse, light-brown; style very short, fuscous, 3- (sometimes 2-) branched; branches long, spreading, clavate; stigma large, globular, papillose, dark-brown, ovary half exserted, sub-conico-rotund, thickly villous with long, whitish, shining hairs; cocci 3, narrow elliptic, obtuse, concave.

Hab. Growing with *Leptospermum*, on dry, open, hilly grounds, back of Poverty Bay; 1885: *Mr. H. Hill.*

Obs. A species certainly very near to the common northern New Zealand species (*P. phylicifolia*, Lodd.), but differing from it in several characters, the most striking being its bright-green foliage, (which colour it also retains in drying,) and its longer panicles of much larger flowers, that are spreading, very white, and conspicuous; an entirely different looking plant from its northern congener.

ORDER XXVII. HALORAGEÆ.

Genus 1. *Haloragis*, Forst.

1. *H. minima*,⁷⁷ sp. nov.

Plant very small, glabrous, wiry, prostrate and creeping, rooting at nodes; root-stock and rootlets glabrous; branches ascending, 1–2 inches high, few (4–6) leaved. Leaves opposite, sub-orbicular and orbicular-ovate, not cordate, apiculate, about 1 line long (sometimes, but rarely, 1½ lines), crenate or inciso-serrate with minute coloured teeth 2–6 to a leaf, thickish, nerveless, light-green. Flowers very minute, scarcely ½ a line long, simple-panicled and racemed at ends of branches, opposite in pairs, lowest pair very distant from the rest on peduncle, upper ones crowded, pendulous on short pedicels, axillary, springing from simple entire foliaceous

77 *Gonocarpus micranthus* Thunb.

green bracts or floral leaves, with very minute coloured bracteoles at base of pedicels; calyx-tube sub-globular or turbinate, 8-ribbed, glabrous, shining, dark-red; lobes large, deltoid, green with purple margins; petals boat-shaped, conniving, apiculate, dark-purple-red, anthers exserted, oblong, obtuse base and tip; stigmas very plumose; fruit not seen.

Hab. Tarawera, high lands between Napier and Taupo; December, 1884; *Mr. H. Hill.* [260]

Obs. A species pretty closely allied to its small New Zealand congeners, *H. depressa*, Hook. fil., and *H. micrantha*, Brown; and also to some of the smaller Australian and Tasmanian forms, but is abundantly distinct in many particulars.

Genus 3. *Gunnera*, Linn.

1. *G. flavida*,⁷⁸ sp. nov.

Plant glabrous, erect, 3–4 inches high; leaves 7–9, radical, membranous, broadly elliptic, $\frac{3}{4}$ –1 inch long, margins sinuate-crenulate, petioles 1–2 inches long. Scape erect, very stout, much longer than leaves (about 4 inches), springing from root-stock below leaves. Flowers not seen. Fruit in a spike (or sub-raceme) 2 inches long, drupes fleshy, $1\frac{1}{2}$ –2 lines long, sub-turbinate, compressed, patent, light yellow, scattered and pedicelled below, sub-sessile and pretty close together above.

Hab. Swampy ground near Tahoraiti, County of Waipawa; April, 1885; *Mr. H. Hill.*

78 *Gunnera prorepens* Hook.f.

Obs. A species having some affinity with *G. prorepens*, Hook. fil., but differing in several characters, as size and form of leaves and petioles, length of scape, and position, shape, and colour of ripe fruit; which in *G. prorepens* are sessile, very compact, and bright-red. I have received, through the kindness and courtesy of Mr. Hill, several good and whole specimens, and they do not vary.

Order XXXIII. UMBELLIFERÆ.

Genus 1. *Hydrocotyle*, Linn.

1. *H. colorata*,⁷⁹ sp. nov.

Plant hirsutely-pilose; stems stoutish, 1–2 feet long, creeping, rooting at nodes 1–2 inches apart, usually one leaf and one peduncle bearing flowers from each node. Leaves pale-green, often purple margined, soft, rough above with muricated points and white sub-succulent strigillose hairs, 8–10 lines diameter, orbicular-reniform with a very broad sinus, 7-veined, 5-lobed (the two outer lobes being larger and sub-lobed), lobes cut $\frac{1}{3}$ rd to middle, each acutely and many toothed; petioles very long, 3–5 inches; stipules rather large, membranous, shining, coloured pink, sharply lacinate. Flowers: peduncles $\frac{3}{4}$ –1 inch; heads small, globular, many-flowered, 15–30; petals broadly-ovate, acute and concave, whitish-yellow streaked with red on the outside, pinkish within, very shortly pedicelled; bracteoles small, linear-spathulate, obtuse, appearing above flower-buds and covering them before expansion, and persistent. Fruit very small, $\frac{1}{16}$ inch diameter, glabrous, chestnut-brown;

79 Possibly *Hydrocotyle moschata* Forst.f.

styles distant, much recurved; carpels somewhat turgid, with a narrow ridged rib on each face; back acutely ridged; dark-brown when fully ripe, persistent. [261]

Hab. In low spots, margins of woods near Norsewood, County of Waipawa; 1884–85: W.C.

Obs. I. This plant forms large dense patches, overrunning all low herbage, roots, twigs, etc., in a very tangled way; it has, however, a pretty uniform and striking appearance from its pale colour and neat leaves. It grows profusely in three or four spots in the locality named, but I have not observed it anywhere else.

Obs II. This species has some affinity with *H. moschata*, Forst., also with *H. compacta*, A. Rich., (another New Zealand species,) and probably with some Australian and Tasmanian species (as *H. hirta*, Br.), judging from diagnoses of Hook. fil., and Bentham; but, in my opinion, is very distinct, and one not readily confounded with our many New Zealand species.

2. *H. alsophila*,⁸⁰ sp. nov.

Plant weak, glabrous, prostrate, creeping, much entangled; stems 1–2 feet (or more) long, rooting at nodes. Leaves rather distant on stems, 1 inch or more apart, membranous, bright green, sub-orbicular-reniform, 9–14 lines diameter, 8-veined and lobed, the four central lobes large and rounded at tips almost entire, or each lobe having three blunt crenate-serratures, the two outer lobes crenate-toothed at base; sinus large; lamina reticulate; petioles 2½–3 inches long, nerved, with a few long

80 Inc. sed.

flaccid succulent jointed white hairs immediately under the leaves, each one enclosed in a pellucid tubular membrane; stipules large, very membranous, largely and finely reticulated, margins entire. Peduncles very short, about 2 lines long, stoutish; umbels 9–11 flowered (usually 10); flowers small, pedicelled; pedicels short, stout; bracteoles bladdery, obtuse, concave; petals white; styles flexuous, incurved; stigmas stout, largely tubercled. Fruit small, $\frac{1}{20}$ th inch diameter, glabrous, very thin, pale yellowish-brown; carpels with one rib on each face.

Hab. In dense dark forests, Seventy-mile Bush, County of Waipawa; 1882–85: W.C.

Obs. This plant grows profusely in large patches, extending many yards each way. It seems to be allied to *H. novæ-zealandiæ*, DC., and *H. heteromeria*, DC., but is quite distinct.

ORDER XXXVIII. RUBIACEÆ.

Genus 1. *Coprosma*, Forst.

1. *C. rufescens*,⁸¹ sp. nov.

A tall, slender, erect, distantly branched shrub, 9–12 feet high; bark greyish; epidermis slightly scaly. Branches and branchlets few, very long, slender, opposite, divaricate at nearly right angles, and spreading; branchlets densely hairy, with patent reddish hairs. Leaves few, somewhat scattered, mostly in distant pairs

81 *Coprosma rotundifolia* A.Cunn.

at tips of branches and branchlets, very membranous, sub-rugulose, broadly elliptic, sometimes (but rarely) [262] orbicular, 6–10 lines long, sub-cuspidate, slightly tapering at base, of a reddish-brown (sometimes of a dark-purple) hue above, pale dull-green below, closely reticulated; primary veins opposite, not extending to margin; margin finally crenulate and slightly recurved, largely ciliated with twisted variegated hairs; very hairy above and below on midrib and veins, with reddish hairs; petioles slender, 2 lines long, densely hairy; stipules hairy, broad, with long cuspidate subulate hard black tips. Flowers: *Male*, very small, under 1 line, hairy, shortly peduncled, 2–3 together; corolla membranous, shallow, cup-shaped, 4-lobed nearly to base; lobes large, spreading, ovate, 1-nerved, recurved; stamens exserted, pendulous; anthers large (for flower), elliptic, whitish: *Female*, single and axillary, but close together in opposite axils, sometimes three together; peduncle short; calyx minute hairy; corolla hairy, 1½ lines long, narrow infundibuliform, mouth 4-cleft, lobes recurved; stigmas 2 lines long, clothed with flattish obtuse scale-like pubescence. Fruit red, didymous, 3 lines broad, 1½ lines long, each half-drupe orbicular; often 2–3 drupæ very close together on opposite sides of the slender branchlets. Seeds globose, 1 line diameter, whitish, smooth, with a fine central ridge on the back, and a small and deep sub-orbicular concavity at their junction, giving them the curious appearance of little rounded univalve shells.

Hab. Scattered on margins of low forests, near Norsewood, County of Waipawa; 1874–85: W.C.

Obs. I. I have long known this species of *Coprosma*; but, as it was very rarely ever seen by me in fruit, and never in flower—from its flowering so very early in the spring, before that I should visit those wet and cold forests—and from my supposing it to be one of those already described, I paid no great attention to it. Last year, however, through going thither very early seeking *Hepaticæ* in fruit, I obtained flowering specimens, and this summer its fruit; and now, after patient and long examination, (for its flowers are very small and also scarce,) I have considered it to be a new and undescribed species; certainly, in some respects, pretty near to both *C. rotundifolia*, A. Cunn., and *C. tenuicaulis*, Hook. fil., but I think distinct from both, and from all other described species of this intricate and puzzling genus; its very peculiar seeds serve well to fix it. Some of its leaves are not unfrequently dark-coloured, of a peculiar purple-coppery, semi-bronzed appearance; and this hue sometimes extends to all on that branch or branchlet. The great scarcity of its ripe fruit I attribute to their being early eaten by birds and insects, as they are very fleshy and sweet.

II. I may also observe that the tips of its branches and branchlets often present a very singular appearance. A small, very hairy ball, $\frac{1}{2}$ inch diameter, with a little crown of 3–4 narrow, long, and very hairy leaflets spreading from its summit, [263] is found there; a curious kind of gall-like excrescence, the work, doubtless, of some insect. A very similar one is also to be met with at the tips of the branchlets of *Hydrocotyle concinna*, Col., mentioned by me in my description of that plant. ("Trans. N.Z. Inst.," vol. xvii., p. 239.)

2. *C. heterophylla*,⁸² sp. nov.

Plant a small, slender, erect shrub 4–5 feet high, of irregular and diffuse growth; bark pale-greyish-brown. Branches long, loose, and very slender, thickly pubescent (as are also branchlets, stipules, and petioles,) with short white hairs; branchlets opposite, long, almost filiform, arcuate, few-leaved. Leaves few, scattered, usually in pairs about 1 inch apart, membranaceous, glabrous, light-green above, paler below, spreading, of various shapes and sizes—rhomboidal, sub-orbicular, lanceolate, and narrowly linear, 3–4 lines long, $\frac{1}{3}$ –3 lines broad, tips acute, veins red and reticulated, margined; margins red and a little recurved, entire and slightly sinuate-crenulate, gradually narrowed into the petiole; petiole short, slender, under 1 line long; stipules very short but broad with a point, sub-ciliated. Drupe lateral, solitary on a short peduncle, generally on the under side of branches opposite to leaves on the upper, and at the outer angles of branchlets, globose, 2 lines diameter, purple-black, glossy, juicy, sweet; calycine lobes at base of drupe persistent, small, deltoid, pubescent, spreading. Nuts very small, elliptic, 1 line long, gibbous, very flat on their sides of junction.

Hab. In thick, dry woods near Norsewood, County of Waipawa; 1885: W.C.

Obs. A species having affinity with *C. rhamnoides* and *C. divaricata*, A. Cunn., also with *C. concinna*, Col.,⁸³ but very distinct. It is a curious and striking plant in its

82 *Coprosma rhamnoides* A.Cunn.

83 WC: “Trans. N.Z. Inst.” vol. xvi., p. 330.

foliage, from their extreme diversity; all the shapes mentioned above being often found on one branchlet. Its long, drooping branches are by far the most slender of all the species of the genus known to me; their being also so very bare of leaves helps to show their extreme tenuity. Flowers not seen; fruit plenty.

ORDER XXXIX. COMPOSITÆ.

Genus 1. Olearia, Mœnch.

1. *O. suborbiculata*,⁸⁴ sp. nov.

Leaves sub-coriaceous, alternate, about $\frac{1}{2}$ inch apart, broadly elliptic, $1\frac{1}{2}$ – $2\frac{1}{4}$ inches long, obtuse and subacute, base rounded and regular, margin entire in the lower half, slightly sinuate in the upper, with a few very small (scarcely developed) blunt teeth, glabrous, green and shining on the upper surface (but [264] when young very pilose, and hairs there deciduous), greenish-white below, and thickly covered with short adpressed hairs, having longer ones scattered among them, veined, veins and midrib prominent below, finely reticulated above; midrib brown; petioles short, sub $\frac{1}{2}$ inch, stout, channelled, half-clasping, decurrent in a ridgy line to the next leaf below; a small orbicular leaf 4–5 lines diameter usually at base of branchlets; branchlets, petioles, midrib and young leaves densely clothed with silky adpressed brown-reddish hairs. Inflorescence sub-terminal and axillary in long loose slender corymbose-panicles, pale-coloured and hairy, 2–3 inches long, three together sub-

84 *Olearia arborescens* (G.Forst.) Cockayne & Laing.

fascicled or joined close at base with connate bracts at bases, each ultimate sub-panicle containing 3–4 heads on slender, nodding, and bracteolate pedicels, $\frac{1}{4}$ – $\frac{1}{2}$ inch long. Heads $\frac{1}{2}$ inch diameter, narrow, oblong, $\frac{1}{4}$ inch long; involucral scales laxly imbricate in sub 5 rows, outer scattered short brown and very villous, inner close, long, linear, pinkish-green, glabrous in the centres and densely shaggy-ciliate at margins, especially at tips.

Flowers: of ray, 8–9, linear, oblong, tips mostly emarginate, white, spreading, sub-revolute; of disk, 6–7, yellowish, lobes broadly-ovate, obtuse, scabrid at tips on outside. Pappus white, rather short, irregular, outer shortest, not thickened at tips, scabrid. Achene small, cylindrical, sub-conical, obtuse, pilose. Receptacle pitted, borders large and ragged.

Hab. Hilly country in the interior, Patea, between Napier and Tongariro Mountain.

Obs. Of this plant I have only received one fair flowering specimen, from Mr. A. Lascelles (who, however, did not gather it himself); it is evidently a branch from a stout shrub, but some allowance must be made for the leaves, which may, lower down, be larger. Its alliance is with *O. nitida*, Hook. fil., and with *O. populifolia*, Colenso, belonging to that sub-section, (*apud* "Handbook N.Z. Flora,") though largely differing from both of those species.

ORDER LVII. LABIATÆ.

Genus 1. *Mentha*, Linn.

1. *M. consimilis*,⁸⁵ sp. nov.

A small sub-erect and prostrate fragrant herb, branches 2–4 inches long, finely pubescent. Leaves few, distant, opposite, petioled, 1½–2½ lines long, sub-orbicular, and broadly ovate or trowel-shaped, very obtuse at apex and truncate at base, green, sometimes dark-pink below, margin (and veins) coloured pinkish-brown, slightly sinuate-crenulate, generally with one notch on each side near apex (sometimes two), and (together with bracts, calyx, and corolla) having many scattered pellucid [265] dots, and a few straggling white hairs on veins below. Flowers white, axillary, mostly in pairs, sometimes ternary and fasciculate, and occasionally single; peduncles short, stout, and (with pedicels) pubescent; pedicels slender, 2–2½ lines long, each with a pair of foliaceous ovate bracts on long petioles; calyx tubular-campanulate, 1½ lines long, villous and ciliate, with spreading white hairs, largely and strongly ribbed, about 15 ribs; ribs and margins of lobes coloured reddish-brown; lobes large, triangular, acuminate, villous on inside; corolla lobes large, flat, spreading, elliptic, very obtuse, slightly crenulate and waved, upper one bifid; stamens exserted, anthers lilac; style largely 2-lobed; stigmas much recurved.

Hab. Dry grassy spots, margins of woods near Norsewood, County of Waipawa; 1882–85: W.C.

85 *Mentha cunninghamii* Benth.

Obs. I have known this little plant for some time, every summer observing it on visiting its habitat, and had supposed it to be identical with *M. cunninghamii*, Benth., yet not without doubts. However, on closely examining it this year (January, 1885), I have detected several characters (*vide descript. supra*) that are not in accordance with those of the N. species (*M. cunninghamii*), as severally described by Cunningham, Benthem, and Hook. fil. It is also much smaller in all its parts, except the flowers, which are larger.

ORDER LXVII. THYMELEÆ.

Genus 1. Pimelea, Banks and Sol.

1. *P. angulata*,⁸⁶ sp-nov.

Branches stout, bark glabrous, brownish-red, studded with raised scars from fallen leaves. Leaves (and branchlets) glabrous, rather crowded, decussate, broadly lanceolate, sub-acuminate, about 1 inch long (a few shorter), 2–2½ lines broad, spreading and deflexed from base, flat but slightly concave towards tip, sub-coriaceous, green above, sub-glaucous and veined below, midrib not prominent, petiolate; petioles 1 line long, white, broad, and adpressed to stem; floral leaves 3–4, much like the caudine but narrower. Flowers terminal on short young branchlets 1–2 inches long, closely compacted in heads of 10–25 flowers, white, erect at first but spreading in opening, villous without, shortly peduncled, peduncles rather stout and very hairy; tube

86 *Pimelea x angulata* Colenso.

infundibuliform, $\frac{1}{2}$ inch long, quadrangular and channelled, constricted below the middle and again swelling at the base, yellowish above and pink below constriction, hairs very long at base; lobes of perianth patent, 2– $2\frac{1}{2}$ lines long, broadly elliptic, sub-acute, sub-convex or raised longitudinally in the middle, with margins slightly incurved, tips resolute and ciliate; stamens largely exserted, divergent; anthers oblong, obtuse, dark orange; style length of tube, sometimes exserted, [266] finely corrugated at base; stigma sub-penicillate; ovary oblong, glabrous, hairy at tip around base of style; hairs long, white.

Hab. Open hilly country in the interior, at Patea, between Napier and Tongariro; kindly sent me by Mr. A. Lascelles.

Obs. I have had but one small branch of this plant, containing, however, 10 heads of flowers. It seems to be a short, much branched shrub, presenting a *Daphne*-like appearance, and would make a pretty garden plant; flowers inodorous. A few perianths possess 3, and even 4, fertile anthers, while many have 2 abortive filaments (some only 1) in addition to the anther-bearing ones, of the same length, and opposite to the other 2 lobes of the perianth. As a species it is very distinct from the known New Zealand ones, (and more so from those of Australia,) but it approaches *P. longifolia*, Banks and Sol., and *P. gnidia*, Forst.

ORDER LXXI. URTICEÆ.**Genus 4. Australina, Gaudichaud.****1. A. *hispidula*,⁸⁷ sp. nov.**

Plant small; every part, including flowers, being more or less hispid; stems 3–4 inches long, stoutish, implexed, finely and closely retrorse-pubescent, procumbent, creeping, rooting at nodes; branches numerous, short, ascending, $\frac{3}{4}$ –1 inch long. Leaves small, sub-reniform and sub-orbicular, always broader than long, truncate at base, 1–2 lines long, $1\frac{1}{2}$ – $2\frac{1}{2}$ lines broad, largely and regularly 5-crenate, hispid and rough with raised points and short white hairs, dark green above, pale below, veins very stout below, and with margins red; petioles rather long, slender, reddish; stipules 2 lines long, subulate, hairy, recurved. *Male* flower single, or 2–3 together, in upper axils on one long succulent peduncle, twice the length of petiole; perianth sessile, diverging, sub-boat-shaped, divided at middle into two concave lobes, the outer one the largest, membranaceous, bladdery, light-green splashed with red, margins irregularly crenulate, dark-green; stamen large, stout, glabrous, transversely ribbed on the back, much recurved; anther large, petaloid, pure white splashed with red on the outside. *Female* flower in lower axils, in pairs but separate, sub-sessile with two small coloured bracteoles; perianth ovate, sub-compressed, semi-transparent, light-green with a narrow dark-red margin, mouth somewhat 3-fid, tips laciniate; style and stigma

87 Not found.

excluded, as long as perianth, obtuse, recurved, brown, very shaggy, hairs flat and branched.

Hab. Sides of streams in shaded spots near Norsewood, County of Waipawa; 1883–85: W.C. Also eastern bases of Ruahine mountain range, same county; November, 1885: Mr. A. Hamilton. [267]

Obs. A species very nearly allied to *A. pusilla*, Gaud. (which also grows plentifully in or near the same localities), but is very much smaller, and differs from that species in several particulars (*vide descript.*). I have occasionally found two perfect stamens issuing from one male perianth; and in a very few specimens, the female perianth in the upper axils above the male; and, in one instance, both male and female singly in one upper axil.

Class II. MONOCOTYLEDONS.

ORDER I. ORCHIDÆ.

Genus 1. Earina, Lindley.

1. *E. alba*,⁸⁸ sp. nov.

Stems stout, 8–10 inches long, sometimes branched at or near base. Leaves alternate, sessile, sub-linear-acuminate, acute, broadest near base, thickish, rather harsh and sub-rigid; petioles long, clasping, decurrent, extending to within the petiole below, black margined. Flowers terminal in compound panicles, 2–4 inches long, rather close-set, sub-distichous, each sub-panicle usually containing three flowers; bracts numerous, imbricated,

88 *Earina autumnalis* (G.Forst.) Hook.f.

striate, brown, the lower acuminate and fimbriate, the upper obtuse with a small mucro. Perianth pure white, 5–6 lines diameter, segments of equal length, spreading, recurved, obscurely 3-nerved, very obtuse; sepals ovate-oblong, margins entire; petals broadly obovate, crenulately notched on the middle of the upper margin; lip broadly oblong (or sub-5-sided), entire, obtuse or slightly retuse at apex, margins corrugated and incurved, two small ochraceous-yellow spots near the centre of tip, and two small greenish crescent-shaped calli beyond those spots and near the base. Column sub-hooded, tip ochraceous-yellow (exactly same hue as the two spots); appendages overhanging in front below anther, and produced in 4 small obtuse teeth and a minute tubercular wing on each side, with 2 minute mammillary-like dots in front, immediately below stigma. Ovary long, cylindrical, striate, twisted.

Hab. On edges of rocky cliffs and on dry stony declivities, and about the dry exposed roots of *Fagus solandri*; banks of River Mangatawhainui, Seventy-mile Bush, County of Waipawa; 1878–85: W.C.

Obs. This plant in appearance closely resembles *E. autumnalis*, Hook. fil., of which it may (by some botanists) be considered as a variety. It possesses, however, sundry characters which that species has not, or which, at all events, are not given in any published description of it that I have seen. Indeed, Hook. fil., says of the genus, “disk eglandular,” whereas the disk of this species possesses two crescent-shaped greenish calli. *E. autumnalis*, which is so very common in the woods at the N., is a larger and fresher-looking plant, with flowers

“speckled and sweet-scented,” and is always epiphytical. Can difference [268] of situation bring about change in characters as well as in habit? This plant is very plentiful in the locality named, causing those dry woods and stony cliffs to look lovely in the autumn season. It has given me a deal of repeated trouble and research, extending over several years, as for a long time I only took it to be a variety of *E. autumnalis*.

Genus 5. *Gastrodia*, Br.

1. *G. leucopetala*,⁸⁹ sp. nov.

Root a long sub-cylindrical greyish-flesh-coloured pubescent tuber, encircled throughout with several rows or rings of scarious long light-brown ovate-acuminate scales, the rows being pretty regular and close together, of about 5 rows to 1 inch, somewhat resembling the sheaths on the stem of some species of *Equisetum*. Stem 2 ft.–2 ft. 9 in. high, erect, sub-succulent, stout, 3 lines diameter and cylindrical below, sub-angular at top, smooth, light-brown with short purplish stripes; 8–9 bracts, perfoliate, membranaceous, distant, on lower part of stem, margins entire, dark purplish-brown, spotted with light-coloured spots much like perianth. Flowers 20–40 at top of stem in a raceme 10–15 inches long, pendulous, rather distant, scattered, pedicelled; pedicels 2½–4 lines long, each with a single sessile bracteole at base 2–2½ lines long, 1 line broad, ovate-acuminate, sub-scarious, reflexed, coloured like those of lower stem but darker. Perianth thickish, papillose, dark brownish-green spotted with large light-(sub-fawn-) coloured spots

89 *Gastrodia cunninghamii* Hook.f.

without, whitish within, ventricose at base, anterior portion much curved upwards, 6–7 lines long excluding ovary, mouth open, 4½ lines diameter, quinquefid; segments spreading, veined, veins branching at tips, margins crenulate; two lateral sepals largest, deltoid, subacute and recurved; upper sepal oblong, obtuse and emarginate; two lateral petals pure white, adnate, projecting from just within perianth tube, linear-oblong, concave, tips truncate and retuse, margins thickened, slightly crenulate, and recurved; labellum white, 3-nerved, disc contracted below the middle, the anterior portion sub-rhomoidal with two reddish longitudinal ridges, their margins thickly crenulato-fimbriate, rising divergent from the middle and united towards tip, but not joined to it; tip produced, thickened, recurved, verrucose and dark-brown at apex; anterior margins of disc finely crenulate-waved and incurved, the middle margins plain and spreading, posterior margins thickened, largely raised, waved and incurved; claw plain and grooved; ovary thick, ovoid, coloured as perianth, at first 3–4 lines long, after flowering twice that size.

Hab. In dark forests on the eastern slopes of the Ruahine mountain range, 1850–52; and in similar spots in the Seventy-mile Bush, between Norsewood and Danneverke, County of Waipawa, 1884–85: W.C. [269]

Obs. I. I have long known this plant, (for upwards of thirty years,) but have never obtained good flowering specimens until this summer (January, 1885). I had, however, always suspected it to be a distinct species from the known endemic one (*G. Cunninghamii*, Hook. fil.), although the specimens I had detected in the woods in

autumn travelling were always long past flowering. Having again met with it in those woods near Norsewood in April, 1884—but, as before, too late!—I marked those spots, and in visiting them again in January, 1885, (almost purposely,) I was rewarded with finding a few in flower on the top of two racemes, not, however, so many as I could wish, and in localities some miles apart. It now appears that the lowermost perianths on their long raceme expand, first, and so regularly proceed up the stalk, like many other flowers produced in racemes and spikes. Having obtained, after all, only a very small number of really good flowers, (though plenty of both unopened and withered ones,) and being very desirous of sending them preserved in spirits to Kew, I have only dissected *one* perfect flower. Of this I have given a very minute description, in the hope of its being compared by some one of our working botanists with *G. cunninghamii*, which, I fear, is daily becoming more scarce.

Obs. II. I believe this plant to be very distinct from the other long-known New Zealand species, but, unfortunately, I have no specimens of that species left for comparison, and the description of it in our botanical books is neither complete nor minute. The pure white petals of this species are a most striking object when fresh and in its dark habitat; its lip, too, is widely different from that of *G. cunninghamii* (viz., the description of it given in our books of the New Zealand Flora); indeed, its lip is more like that of the Australian species, *G. sesamoides*, Br., though the perianth differs considerably. Of this species a fine drawing, with dissections and description, is given in the “*Flora Tasmaniæ*” (Bot. Antarctic Voyage, vol. vi.).

Genus 10. *Microtis*, Banks and Sol.

1. *M. papillosa*,⁹⁰ sp. nov.

Plant rather stout, 1 foot–1 foot 6 inches high, finely and thickly papillose. Leaf erect, fistulous, ribbed internally, much longer than scape. Spike 1½–2 inches, flowers not crowded, sub 30; pedicelled; pedicel short, about 1 line long, stoutish; bracts oblong, acuminate, acute, 1-nerved, longer than pedicel, adpressed to flower. Perianth, upper sepal orbicular, 3-nerved, concave, apiculate; lower pair, ovate, acute, recurved; lateral petals linear-ovate, very obtuse; labellum oblong, waved and crisped, sub-fimbriate, bifid, sinus broad, truncate at base, apical lump at base of sinus, large, verrucose, continuous to the [270] two lumps at base of labellum, which are again divided, so making four.

Hab. Kaipara Heads, West Coast, North Island; *Mr. C. P. Winkelmann*; in letter, October, 1884. Flowering in October.

Genus 12. *Pterostylis*, Br.

1. *P. patens*,⁹¹ sp. nov.

Stem stout, 1-flowered, 4 inches high; 2–3 short ovate acute brownish and scarious bracts near base; 4–5 stem-leaves, equidistant, 3 inches long, 5–7 lines broad, sub-linear-lanceolate, not narrowed at base, sub-acute, recurved and revolute, thickish, finely papillose, keeled, 3-nerved, nerves obscure; uppermost leaf shorter, close to base of ovary, 1½ inches long, erect, half the length of

⁹⁰ *Microtis unifolia* (Forst.f.) Reichb.f.

⁹¹ *Stet.*

perianth and sub-clasping. Perianth large, very open, bladdery, particularly at base, which is sub-globular, somewhat sub-quadrata in outline and very wide; upper parts of segments brownish-red, extending low down on lateral sepals. Galea erect, broadly arching and flat above, 2 inches long without tip; tip of dorsal sepal hooked, sub-acuminate, extending $\frac{1}{2}$ inch beyond lateral petals, which are strongly 1-nerved, broad at tips, and acute; lower lip, the entire part thrown largely forward and downward, cuneate, $\frac{3}{4}$ inch long, much concave between lobes, their margins incurved above, and the lobes suddenly and completely reflexed below base of perianth, and extending downwards and horizontally beyond base of upper bract (or floral leaf), tapering into stoutish points more than 1 inch long. Labellum prominent, very irritable, linear-oblong, 10 lines long, $2\frac{1}{2}$ lines wide, truncate at base, recurved at tip, with a longitudinal central stout ridge throughout; tip thick, obtuse, red, minutely papillose; claw stout, curved, nearly 2 lines long, a thick green protuberance on under surface opposite to its base, and a large tuft of stoutish spreading fimbriæ at tip, which are also lobulate or branched; column slender, wings incurved, large, more than 4 lines long, front margins sub-sinuate with a long finely subulate erect tooth from upper front angle rising above anther, lower lobes obovate or oblong and rounded, margins entire; stigma long, narrow, not prominent, at its central base an erect subulate white appendage, 2 lines long, projects forward from between two finely incurved corrugated lines or side-angles of lower column.

Hab. Forests, hilly country, near Norsewood, County of Waipawa; 1883–84: W.C. Glenross, County of Hawke's Bay; 1884: *Mr. D. P. Balfour.*

Obs. I. I first detected this plant in 1883, but then, while perfect, it was past flowering. Believing it to be a new species, I brought away carefully its tubers and planted them in a pot, and they have grown strongly and flowered. I have had, however, but one fresh flower to examine, but this was so large, [271] fully developed and gaping, that I had no difficulty in so doing, and that without breaking-up or even gathering the specimen.⁹² Its form is striking, and its habit peculiar; all its floral parts being so very open and free, and its lateral sepals wholly deflexed horizontally; in these characters I have not seen anything like it among all the flowers of the genus, neither in these species of New Zealand, nor in those of Australia and Tasmania.

Obs. II. I may also remark that a slenderer plant of the same height grows close to the above, (in the pot,) as if from a twin-tuber, the three leaves of this are near the top of its stem, and are about as long as those of the other, but are sub-linear-spathulate; it has also a similar scarious bract at the base. It may be the barren or leafing form (young) of this species; as such obtains among some of the Australian and Tasmanian species—as, for instance, in *Pt. obtusa*, Br., Hook. fil., “*Flora Tasmaniæ*,” pl. 115, C.

92 WC: I have, however, since writing the above, received flowers of several plants from Mr. Balfour, which fully agree with my description. (November, 1885.)

2. *P. rubella*,⁹³ sp. nov.

Small, erect, slender, glabrous, 3–4 inches high. Leaves 2–3 at base, cordate, 3 lines long, petioles same length; caudine bracts 4, ovate-lanceolate, the lowest petiolate, the upper 3 sessile, half-clasping. Flower solitary, erect, 6–7 lines long; dorsal sepal arched, convex, striate, very acuminate, 9 lines long; lateral sepals (lower lip) connate, emarginate, with two long slender green tails, erect and spreading, 10 lines long, rising much above galea; petals, lanceolate-acuminate, acute, of same length as dorsal sepal; lip glabrous, dark-red, linear-lanceolate, acuminate, 4 lines long, under 1 line wide, grooved, tip thickened, obtuse; appendage curved, red, trifid-laciniate and minutely fimbriate or sub-penicillate, not villous; column, wings red, rounded above, not horned, largely produced and slightly fimbriate below.

Hab. Whangaroa, County of Mangonui; 1884: *Mr. R. W. Rowson.*

Obs. A species having some affinity with *P. trullifolia*, Hook. fil.

3. *P. tristis*,⁹⁴ sp. nov.

Plant very small, rather dingy-looking, with a greyish-green appearance. Leaves small, 5–7 sub-rosulate, broadly ovate, obtuse or sub-acute, thickish, pale-green, deeply pitted, sub-concave, midrib stout, white and prominent below, margins closely and finely sub-

93 *Diplodium trullifolium* (Hook.f.) D.L. Jones, Molloy & M.A. Clem.

94 *Stet.*

crenulate, about $\frac{1}{2}$ inch long, including petiole; petiole very broad and stout, 2–3 lines long, white, with three green veins. Scape stoutish, 2–2 $\frac{1}{2}$ inches high, with [272] 3–4 long acuminate bracts, clasping, adpressed, besides those under each pedicel. Flowers 2–3, on rather long pedicels, light-brownish striped with red, scarcely $\frac{1}{4}$ inch long, and nearly as broad, sub-second, slightly drooping, gaping; galea boat-shaped, much and somewhat abruptly arched with a short tip; petals broadly lanceolate or sub-rhomboidal, lower margin cilio-serrulate, tip acute; lower lip sub-orbicular, bifid nearly to middle, tips sub-acute, scarcely produced; labellum small, pale, highly irritable, broadly oblong, margin entire, very obtuse, with two minute crenulations at tip; appendage short, thickened and rounded at base, sub-erect, free, dark-green; column wings sub-quadratae, auricled, auricles very obtuse and rounded, their margins finely ciliate, not produced above, but front upper angle thickened and dark-green; the lower and slender portion of the column broadest in the middle; stigma small, scarcely prominent. Ovary (immature) long, clavate; valves widely separate, with narrow, raised, green margins and round apices.

Hab. Open turf spots, flat lands, south bank of the river Waipawa; 1885: *Mr. H. Hill.*

Obs. I. This is an interesting little species, from its differing so very widely from all its known New Zealand congeners: yet, in several particulars, allied to some of the small Australian species, as *P. mutica*, Br., and *P. aphylla*, Lindl. Its little labellum is very irritable, (like those of some other species of this genus,) closing sharply up against the column with a spring on being

only slightly breathed on! and so remaining. Their root-leaves, like those of the allied Australian species above-noted, mostly wither before flowering.

II. In the spring of this year (1885), I received from Mr. Hill two very small plants about $\frac{1}{4}$ inch high, with their tips of greyish leaves scarcely emerging above the tuft of mosses among which they grew, yet, fortunately, with their subterranean stems and little tubers complete. These I carefully planted, and was rewarded in seeing them flower in November. Mr. Hill informs me that it was on a spot where he was resting, during his journey, that he casually found them (in the mosses). I presume, from the smallness of the plant, and its dull, uninviting appearance, it has long been overlooked.

Genus 15. Thelymitra, Forst.

1. *T. alba*,⁹⁵ sp. nov.

Rather stout, 8–9 inches high. Leaf linear, 10–11 inches long, 3–4 lines broad, rather thin, many-nerved (sub 10), nerves closely and finely papillose at back in lower part of leaf. Raceme 3 inches long, 8-flowered; pedicels $\frac{1}{2}$ inch; bracts large, 1– $1\frac{1}{2}$ inches long, oblong, suddenly acuminate, very acute, 10-nerved (as also sepals and petals). Sepals light-greenish purple with very thin white margins; petals pure white; both with [273] labellum broadly ovate-acuminate with a mucro at apex, and all of equal size. Column rather short; tip recurved, deeply notched, sides of hood produced, with 2 angles, and notched in front between them; dark-brown with yellow margin; the appendages much produced in front, as high

95 *Thelymitra longifolia* J.R.Forster & Forst.f.

or higher than the column, very plumose; hairs white, branched, closely barred and knobbed at tips; side wings of column much excised; stigma large, sub-quadrata, sinuate and slightly laciniata at base; 2 small erect teeth in front, in centre of column margin; rostellum globular, prominent; anther tip long, subulate, obtuse.

Hab. Glenross, County of Hawke's Bay; 1885: Mr. D. P. Balfour.

Obs. A species having pretty close affinity with *T. longifolia*, Forst.; *T. nuda*, Brown; and *T. nemorosa*, Col.; but differing from them all in several characters.

Genus 17. **Prasophyllum**, Br.

1. ***P. pauciflorum***,⁹⁶ sp. nov.

Slender, erect; stem 7 inches high. Leaf-sheath 3 inches longer than spike, narrow, tip thickened, acute, blackish. Spike short, few-flowered (7); flowers distant, pedicelled, pedicels very short; bracts small, truncate with sinuous margin, or notched. Perianth rather small, sub $\frac{1}{4}$ inch, spreading, light yellowish-green; dorsal sepal broadly ovate, acute; lateral sepals united from middle downwards, acute slightly acuminate, entire not notched; petals linear, obtuse, 3-nerved, the lateral nerves only reaching half-way; lip small, broadly orbicular-ovate; lamina thin, 3-veined, the 2 outer veins branched, margin entire but slightly sinuate; claw very short; tip recurved with a small yellow globular lump adnate at the bend; column very short and thickish, with a broad membranous rounded hood at back above anther, margin

96 *Corunastylis nuda* (Hook.f.) D.L. Jones & M.A. Clem.

of hood entire, and 4 minute erect linear lateral staminodia; ovary short, turgid.

Hab. Hills, country west of Napier; 1883: W.C.

Obs. I have obtained only one specimen of this plant; and, though early satisfied of its being very distinct from the three published New Zealand species, and also from all the Australian and Tasmanian ones described by Bentham in "Flora Australiensis," I wished to get more specimens before describing it, as there may be some variation in size and number of flowers; not, however, being successful, I now make it known.

Genus 18. *Orthoceras*, Brown.

1. *O. rubrum*,⁹⁷ sp. nov.

Root, a small fusiform white tuber. Stem rigid, erect, slender, smooth, 1 foot high, greenish dashed with purple-red. [274] Leaves few; basal 2–3, green, erect, thickish, linear, very narrow, 5–6 inches long, less than 1 line wide, deeply channelled, margins conniving, very acuminate, tips piliferous; cauline 2, nearly equidistant, similar to basal but smaller, adpressed to stem, with large red-coloured membranaceous sheathing bracts at base, acuminate. Flowers 3–5, small, dark-red, thickish, rather distant, pedicelled in a short raceme at top of stem, the bract at base of pedicel broad, sheathing, membranaceous, ovate-acuminate, acute, 9–10 lines long, 3 lines broad, many nerved, not keeled. Dorsal sepal very broad, sub-quinquangulato-orbicular in outline, 5 lines

97 *Orthoceras novae-zeelandiae* (A.Rich.) M.A. Clem., D.L. Jones & Molloy.

long, 3½ lines broad, apex slightly obtusely-angled with a fine mucro, sub-10-nerved, margins thin, entire, incurved; lateral sepals very narrow, almost wiry, erect and curved, 8–9 lines long, deeply channelled, tips acute; petals thin, white, narrow-linear above, broad and spreading below, bifid at apex. Labellum heart-shaped, 4 lines long, 3 lines broad, slightly and finely transversely wrinkled, side margins incurved, tip acute; lateral lobes sub-ovate, obtuse, the middle lobe slightly larger, broadly-ovate-acuminate; the transverse callus at the base of the lateral lobes smooth, triangular, bifid at apex, and recurved towards column. Column, tip apiculate, sides conniving, the two lateral appendages finely subulate, rough.

Hab. Open grounds among fern, high clayey hills between Napier and Mohaka, Hawke's Bay; 1870–76: W.C. Glenross; 1885: *Mr. D. P. Balfour* (a single specimen only).

Obs. This plant has been long known to me; and, while I had my doubts as to its being identical with the northern form of this genus (*O. solandri*), mainly from the difference in colour, in its being more slender, and its general appearance, I never satisfied myself till this year; partly owing to my want of specimens of the northern plant for comparison, as well as to my not possessing any full description of it, neither of the Australian species (*O. strictum*); for R. Brown, Lindley, A. Cunningham, and Sir J.D. Hooker, say very little about the two species. More recently, however, Bentham, in his "Flora Australiensis," has gone fully into the Australian plant; and as now I have also A. Richard's full description of

the New Zealand one, with a folio plate of drawings and dissections, I have closely examined and compared this species, and I find it to be (as I had supposed) different, and that in several characters. Bentham, however, states that the two long known plants of Australia and New Zealand are but *one* species. His words are: "The New Zealand plant does not appear to me to differ in the slightest particular" (*loc. cit.*). This may be the case with the old and early described New Zealand one; which, from description, drawing, and dissections by A. Richard, is very distinct from this species. [275]

ORDER VII. LILIACEÆ

Genus 6. *Arthropodium*, Br.

1. *A. reflexum*,⁹⁸ sp. nov.

Plant small, leaves many, 10–12, nearly flat, grass-like, membranaceous, green, glabrous, margins purple, sub-linear-lanceolate, acuminate, tips acute, 9 inches long, 3 lines wide, spreading, drooping, obsoletely veined, keeled below, half-clasping and deeply canaliculate at base, with margins conniving, bases (also those of pedicels and scape) thickly purple-spotted; scape 9–10 (or more) inches long, erect, sub-flexuous, very slender, almost filiform, less than $\frac{1}{2}$ line diameter at base; cauline or floral leaves large, foliaceous, spreading, cernuous, sub-linear, acuminate, broadest near base, sessile, half-clasping, lowest $4\frac{1}{2}$ inches long, 2 lines wide, upper 1 inch long and 1 line wide. Flowers distant, lowest

98 *Arthropodium candidum* Raoul.

internode $1\frac{3}{4}$ inches, alternate, somewhat sub-verticillate, axillary, (two together in lowest leafy bract only, but separate,) with a small, coloured, broad, and truncate membranaceous bracteole between pedicel and scape; raceme 6 inches long, 9–11 flowered; pedicels $\frac{3}{4}$ inch long, slender, drooping, jointed above the middle, lowest longest; perianth white, wholly and strictly reflexed and nodding (like *Cyclamen*); segments 6, sub-convex, $2\frac{1}{2}$ –3 lines long, green at bases; three outer, oblong-ovate, obtuse and thickened at tips, 3-nerved; three inner oblong, rumpled, sub-fimbriate above, emarginate; filaments white, much shorter than perianth, $1\frac{3}{4}$ –2 lines long, slender, naked, more than $\frac{1}{3}$ rd length from base, densely hairy above, but not close up to anther, hairs very short at top, being gradually reduced in size upwards, large and bushy at middle, patent, moniliform, largely clavate and compound-branched; anthers pale, small, about $\frac{1}{3}$ rd line long, oblong, broadest at base, but not divergent, recurved at tips; style glabrous, erect, much longer than anthers, 2 lines long; stigma spreading, finely penicillate; ovary green, glabrous, sub-oblong-globose, flattened at tips. Capsule (ripe) bluntly deltoid, 2 lines diameter, depressed, very membranous, green, much rugose from seeds; seeds many (15), broadly-oblong, turgid, slightly and irregularly sub-compressed, black, shining, very minutely dotted; funicle long, slender, adhering.

Hab. Shaded sides of mountain streams, Seventy-mile Bush, County of Waipawa; 1870–83: W.C.

Obs. I. This graceful little species is nearly allied to our other small New Zealand species, *A. candidum*, Raoul,

and also to *A. neo-caledonicum*, Baker,⁹⁹ differing, however, in several characters. I have long known this plant, and always suspected [276] it to be distinct from *A. candidum*; but not till this summer (January, 1885) did I obtain it in its flowering state, and then only by bringing its roots away last year from the woods and planting them in a flowering pot: they have grown well and rapidly.

Obs. II. This plant has some peculiar habits, which, having repeatedly noticed them, are worth recording. It only opens one flower at a time, beginning at the lowest, when the segments of its perianth quickly assume their tightly reflexed position, and its anthers are already bursting at their tips; it only remains open for one day, closing at nightfall, when the segments, etc., are closely and longitudinally appressed to the ovary, where they remain. The ovary rapidly swells, and its pedicel elongates. After the first lowest flower has flowered, the second one in the same axil (scarcely visible before) begins to lengthen its pedicel, but this did not expand. Its leaves begin early to wither at their tips, before the plant has opened one-third of its flowers.

ORDER IX. JUNCEÆ.

Genus 3. *Luzula*, De Candolle.

1. *L. sub-clavata*,¹⁰⁰ sp. nov.

99 WC: See "Journal Linnean Society," vol. xv., p. 352.

100 Possibly *Luzula picta* A.Rich. var. *pallida* (Hook.f.) Edgar.

A tufted erect herb, branching from the roots. Culms slender, sparingly leafy, 18–24 inches high. Leaves numerous, flat, and grass-like, 5–6 inches long, 2 lines wide, 16-nerved, with distant transverse nettings, apices thickened terete and sub-clavate, margins slightly and distantly serrulate, and sparsely ciliate with very long whitish hairs. Flowers in a long, loose, slender panicle of 2 (sometimes 3) sub-sessile broadly ovoid many-flowered heads, several inches apart; heads $\frac{1}{2}$ inch diameter, simple or compound, on short pedicels, the lowermost head having 2–3 long narrow foliaceous bracts at base, their apices thickened and terete like those of the leaves, the uppermost head is usually bractless. Perianth small, 1 line long; segments ovate-acuminate, whitish-brown with a dark central line, much longer than capsule; stigmas long, flexuous, and rough. Capsule sub-ovoid, triquetrous, smooth, shining; valves broadly oblong-lanceolate, apiculate, with a strong central vein. Seeds oblong, turgid, darkish brown, shining, finely reticulate-striate, with a dark spot at tip, the hilum produced and puberulous, and a narrow white line forming the ventral suture. Bracteoles small, broadly ovate, white, shining, adpressed; tips minutely ragged with a mucro.

Hab. Dry woods, banks of River Mangatawhaiiti, between Norsewood and Danneverke, County of Waipawa; 1885: W.C. [277]

Order XI. CYPERACEÆ.

Genus 4. *Scirpus*, Linn.

1. *S. novæ-zealandiæ*,¹⁰¹ sp. nov.

Rhizome creeping, branched, woody; stems simple, and branched at base. Culm slender, 2 feet high, 1 line wide, trigonous, cylindrical at base, solid, smooth, pale sea-green. Leaves 3–4, much shorter, longest about half the length of culm, distant, linear, sub-grass-like, 1½ lines wide, smooth and same colour as culm, deeply channelled, sheathing, apices blunt, margins of tips scaberulous; sheaths long; ligula large, elliptic, membranous; sheathing bracts at base 3–5, broad, 3 lines wide, transversely netted, uppermost abruptly contracted at apex and cuspidate; cusp narrow linear, nearly 1 inch long. Spikelet solitary, lateral, broadly ovoid, 3–4 lines long, 1½ lines broad, sessile, dark red-brown, 12–15-flowered. Glumes broadly ovate, very concave, densely imbricate, membranaceous, very thin at margins, erose and sub-fimbriate towards apex, bifid, aristate, much keeled, red, glabrous, shining; outermost obsoletely 3-nerved, very broad and clasping, transversely wrinkled, finely fimbriate, largely and coarsely aristate. Involucral bract 1½–2¼ inches long, erect, continuing the culm and precisely like it, slightly hollowed into a sheath at the base, with short broken and scarious margins; tip flattened, sub-acute, margins scaberulous like leaves. Style long, blackish-brown; stigmatic branches 3, longer than style, flattened at bases, roughish, obtuse. Anthers linear-acuminate, with a long acuminate connective,

101 Possibly *Schoenoplectus pungens* (Vahl) Palla.

truncate at base, light-yellow; filaments flat, 1-nerved, pale-coloured. Hypogynous bristles 3–4, shorter than nut, linear, obtuse, largely retrorse-scabrid, red-brown. Nut broadly obovoid, $\frac{1}{10}$ th of an inch long, tipped with a small black point remains of style, gibbous, flat on one side, smooth, shining, pale drab-brown minutely spotted with red; clustered and sessile in little niches around short thick sub-tetragonal spike, upper 3–4, small, abortive.

Hab. Sandy flats, low margins of rivers, Hawke's Bay; W.C. Near Puketapu; 1885: *Mr. D. P. Balfour.*

Obs. A species having affinity with another indigenous species, *S. triqueter* (of R. Brown), and of "Flora Novæ Zelandiæ," and also of the "Handbook New Zealand Flora," but said by Bentham not to be the *S. triqueter* of Linn., but to be *S. pungens*, Vahl, ("Flora Australiensis,") differing, however, in several characters.

Genus 6. *Isolepis*, Brown.

1. *I. reticularis*,¹⁰² sp. nov.

Plant small, gregarious, loosely tufted, filiform, flaccid, sub-erect and drooping, light-green. Culms 5–8 inches long, sub-cylindrical, compressed, channelled on inner surface. Leaves [278] many, shorter than culm, each one (also culm) issuing from a fistular sheath; sheaths $\frac{1}{2}$ –1 inch long, red, sulcated, glossy, truncated with a rather long, abrupt linear mucro. Involucral bract usually 1, erect, obtuse, continuation of culm, $\frac{1}{4}$ – $\frac{1}{2}$ inch long. Spikelets ovoid-acuminate, generally 3, lateral, 1–2 lines long, the middle one longest, pale coloured with

102 *Stet.*

conspicuous green stripes, sometimes only 1, and also (but rarely) 4–7 and then proliferous, with small leafy bracts arising from coloured sheaths. Glumes numerous, about 15, concave, broadly ovate, sub-acute, whitish, sprinkled with oblong red dots, and a broad green line on the back, but not keeled, strongly and many-nerved, netted with numerous transverse veinlets, margins entire, thin. Nut very small, elliptic, slightly sub-trigonous with a narrow produced margin and a long apiculate beak, shortly pedicellate, pale whitish-brown, smooth, glossy. Style red-brown; stigmatic branches 3, long, curved, scarcely scaberulous but roughish, as with minute tubercles. Stamen 1, filament clavate, often persistent on nut and nearly twice its length.

Hab. Low wet grounds, sides of rivers, and damp shaded woods, where it forms large grass-like beds; Seventy-mile Bush, County of Waipawa; 1880–85: W.C.

Obs. A species having pretty close affinity with *I. inundata*, *I. riparia*, and *I. prolifera*, Brown, (*Scirpus* of Sprengel, and of Bentham, "Fl. Australiensis,") but approaching nearest to the former; differing, however, in its many leaves, and in its nut being narrower and obtusely angled, with a long terminal point; and from them all in its peculiar netted scales, and in its coloured truncated sheaths to leaves and culm.

Genus 10. *Gahnia*, Forst.

1. *G. scaberula*,¹⁰³ sp. nov.

Plant bushy, in moderate size tufts, leaves rough, 3–4 feet long, spreading; culms terete, smooth, leafy, about same length as leaves. Panicle 18 inches long, compound, slender, nodding, general colour light-brown; sub-panicles and pedicels light yellowish-green; peduncles and sub-peduncles slender, roughish, compressed; pedicels scabrid, flattish, rigid, 2–4 lines long; floral bract scaberulous, 7-nerved, very acuminate, sub-awned, dark red-brown, edges scarious and pale-coloured.

Spikelets small, slender, 3 lines long, with generally seven glumes closely appressed; the three outer glumes minutely rough above, dark red-brown, the outermost one 3-nerved, scabrid on central nerve, aristate, barbed; the inner glumes 1-nerved, acuminate, very small and convolute, with very concave margins and obtuse apiculate tips, smooth below, scabrid at tips, the innermost one wholly puberulent and emarginate, their bases white, tips reddish-purple. Stamens: anthers 4, linear-lanceolate, 1½ lines long, pale straw-colour, with a long acuminate and serrulate [279] connective, rather abrupt at base; filaments a little shorter than anthers.

Style long, scabrid, especially at base, 2-branched, each branch with two very long flexuous stigmata, sometimes with an odd one, five in all. Nut transversely grooved within, sub-spindle shape, 3 lines long, obtusely ribbed, shining, red, apex black and scaberulous, slightly produced and crowned with the persistent base of style,

103 *Gahnia pauciflora* Kirk.

when fully mature pendulous in long hypogynous scales (or “filaments” of authors), which are 4–8, bright-red, long and very narrow, much crumpled and twisted.

Hab. Dry spots, margins of forests, Seventy-mile Bush, County of Waipawa; 1880–85: W.C.

Obs. I have known this plant for several years, but it was only during this summer (1885,) that I obtained perfect and complete specimens; this, however, was partly owing to my not greatly caring to gather it for examination, believing it, from its general appearance, to be one of the already-described species.

[See my note on this genus at the end of my descriptions of these *sp. nov.*]

2. *G. parviflora*,¹⁰⁴ sp. nov.

Plant forming small diffuse bushy tufts. Leaves very narrow, almost linear, 3 lines wide, 3 ft. 6 in. long, with long filiform tips, margins thickened and recurved, upper part of leaf scabrid, the lower smooth. Culms 2 ft. 6 in. to 2 ft. 9 in. long, very leafy, cylindrical, smooth; panicle 18–20 inches, slender, open; sub-panicles (6–7) 3–4 inches apart; spikelets distant, not crowded. Floral bract broadly ovate, corrugated, aristate, awl short; sub-panicle, stem sub-4-angled below, angles rough, 3-angled above, compressed, scabrid. Spikelet broadly obovate, sub 3 lines long, blackish; glumes all large and broad and nearly of equal size, oblong-ovate, acute, not acuminate, loosely concave, smooth, pubescent or roughish at tips, the outer glumes largely corrugated, the outermost much

104 *Gahnia pauciflora* Kirk.

shorter than spikelet. Style long, black, thick at base, with short red hairs; stigmas 4, sub-fasciculate, long and branching from below close to the forking of the style. Nut narrow ovoid, somewhat turgid, $2\frac{1}{2}$ lines long, slightly grooved, whitish, tip brownish, red and shining when mature and old, transversely rugulose within, base of style persistent? Hypogynous scales ("filaments" of authors), 8, very long and fine, much crumpled and entangled, dark-red.

Hab. Scattered among low bushes and small scrubs, dry hills, near the bridge over the River Whakaruatapu, Seventy-mile Bush, County of Waipawa; 1881: W.C.

3. *G. exigua*,¹⁰⁵ sp. nov.

Plant rather small, slender, spreading, forming small separate tufts. Leaves narrow, about 2 feet 6 inches long, striate [280] below, scabrid, margined, excessively long filiform at tips. Culms 3 feet long, slender, leafy; stem-leaves very long, drooping, narrow and filiform at tips. Panicle very slender, 2 feet to 2 feet 6 inches long; sub-panicles distant. Floral bract narrow, excessively acuminate, 13–14 lines long, (of which the filiform beak is more than half,) slightly roughish, light-brown. Spikelet very slender, $2\frac{1}{2}$ lines long, narrow, obovate-lanceolate, with sharp tips of outer glumes extending beyond, dark-brown; pedicels filiform, scabrid, rigid, 2–4 lines long; 4 outer glumes very acuminate and decreasing gradually in size, 1-nerved, minutely scabrid on nerve at back and on margins (especially the two outer), red-brown; 3 inner small, obtuse, apiculate, smooth, white

105 *Gahnia pauciflora* Kirk.

below, reddish and finely scaberulous at tips. Stamens: anthers 4, subulate; connective long, acuminate, acute, entire, minutely and distantly roughish under a lens, base sub-sagittate; filaments shorter than anthers.?

Hypogynous scales ("filaments" of authors) 6–8, very long, fine, crumpled and twisted, reddish-brown, filiform below, broader, flat, 1-nerved, and obtuse at tips. Style rather long, slightly rough, thicker and pubescent at base, pale red-brown. Stigmas 3 (rarely 4), long, sub-fasciculate, roughish, dark-brown. Nut (immature) minutely puberulous at tip; ripe, $2\frac{1}{2}$ lines long, broadly lanceolate, shining, grooved, and obtusely angled, red with a black spot at tip, base of style persistent, transversely grooved within.

Hab. Among shrubs, etc., on dry spurs of hills near Mata-mau, County of Waipawa; 1882: W.C.

4. *G. multiglumis*,¹⁰⁶ sp. nov.

Plant forming medium size tufts; leaves and culms of equal length, about 5 feet long, spreading, drooping. Leaves pale-green, narrow, almost linear, 4 lines wide at broadest, upper portion and tips excessively narrow, almost filiform, margined, slightly scaberulous below, more so above; culms leafy, straw-coloured. Panicle 3 feet long, slender, graceful, secund, compound, with about twelve compound (3-branched) drooping sub-panicles, the lower ones being 3–4 inches apart; floral bract dark-brown, appressed, enclosing 2 spikelets, small, very acuminate, awl-like, arista extending length of spikelet; peduncle and pedicels flat, narrow, rigid, slightly

106 *Gahnia pauciflora* Kirk.

scaberulous at edges, straw-coloured; pedicel length of spikelet; spikelet dark reddish-brown, broadly obovate, turgid, sub 3 lines long, possessing 9 scales, all shorter than spikelet or (immature) nut, 1-nerved, minutely and closely pubescent at tips; the 3 outer very small, half the length of spikelet, narrow, ovate, acuminate, tips sharp, diverging; the 3 next broadly ovate, acute, transversely wrinkled; the 7th scale is the largest, broadly oblong, apiculate, much concave and overlapping at base; the 8th oblong; the 9th (and terminal) narrow-oblong [281] or sub-lanceolate, and rather large for the innermost scale, and (with the 8th) apiculate and concave. Nut narrow, spindle-shaped, sub 4-sided at the middle, much grooved, 3 lines long, white, shining, black tipped, with base of style persistent, transversely ribbed within, ribs few, 6–7; style long, 2-branched, stigmatic branches 4, sometimes 5, blackish rough.? Hypogynous scales (“filaments of authors”) 8, very long and fine, and excessively crinkled and compacted, both within spikelet around base of nut as well as outside, light red-brown.

Hab. Dry *Fagus* forests near Norsewood, County of Waipawa; 1885: W.C.

Obs. A species having pretty close natural affinity with the preceding species, *G. parviflora*.

A Note on the Genus *Gahnia*.

It is a curious fact that no modern botanical author has given any description of the anthers of *Gahnia*; indeed, they are not once mentioned or alluded to by them, not even when describing the genus or its species. Not by Brown, “Prod. Fl. Nov. Holl.:” nor by Kunth, usually so very complete, “Plant. Enum.:” nor by Hooker, in both

"Fl. Nov. Zel.," and in the "Handbook Fl. N.Z.," and also "Fl. Tasm.;" nor by Bentham, in "Fl. Austral." Forster, however, who constituted the genus, does so, giving at the same time a characteristic drawing of the anthers of his type species ("Char. Gen. Plant.," tab. 26); at the same time Forster omits altogether the long "filaments." La Billardiere, who described two species, and has given plates of them with dissections in his large work, "Prod. N. H. Plant.," shows the anther; and in both Forster and La Billardiere there is also the peculiar and specifically distinct connective. In two of these species now described by me I have been able to give their respective anthers, in which their connectives also differ considerably, and thus afford a valuable specific character. Both Forster and La Billardiere, who describe the anthers and stamens of their species, show how very short the stamens are; which, however, by the latter are said to lengthen after flowering, but only (as shown in his plates) in a very limited degree. Subsequent botanical authors have said that this lengthening of the stamens forms those greatly elongated and crumpled "filaments" so highly characteristic of this genus. I have, however, my doubts as to whether those are not hypogynous scales (some of them at least), similar, only much longer and flaccid, to those of the closely allied genus *Lepidosperma*. At all events, such is really the case in two of the four species I have described in this paper, (*G. scaberula* and *G. exigua*), in which are to be found, at the same time, both short stamens bearing anthers and those long crumpled "filaments"—which [282] are also "broad, flat, 1-nerved, and obtuse at tips." Moreover, the "stamens" or "filaments" are almost invariably

represented as being three or four in number— sometimes, but rarely, six; I find them, however, to be usually double that number, viz., eight. I had both hoped and intended to have paid some close attention to this subject during this summer (1885–86), in their native woods, and in their proper season of first flowering, (which was also the reason of my not having more closely examined in that particular those species I have herein described,) but the great distance from me of their known habitats (nearly one hundred miles), and my time now being fully occupied with other matters, prevent my doing so. I would, therefore, recommend this study to those botanists in New Zealand who may have both time and opportunity of performing it; and that not merely for determining whether those elongated filaments (or some of them) are really hypogynous scales, but for the purpose of ascertaining the several forms of the connectives of the respective species.

Class III. CRYPTOGAMIA.¹⁰⁷

ORDER IV. MUSCI.

Genus 46. Polytrichum, Linn.

1. *P. ruahinicum*,¹⁰⁸ sp. nov.

107 WC: The paper I had prepared containing Cryptogamic plants (*sp. nov.*), was read at the ordinary meeting of the Hawke's Bay Philosophical Institute held in September, 1885: however, these in this paper (with a few others) were since discovered, and being six notable novelties, I embrace this opportunity of early making them known.—W.C.

108 *Stet.*

Stems simple, erect, rather stout, sub-rigid, red, 1–2 inches high, about $\frac{1}{2}$ inch of lower portion bare. Leaves numerous, spreading; lower slightly decurved, upper erect; linear-subulate, 5 lines long, smooth, softish, green, opaque, margin finely pellucid and sharply serrate to base; tips acute, brown; nerve stout; base much and suddenly dilated; basal cells minute, sub-orbicular, and double-walled, those of the dilated membranous portion larger, linear-oblong and rectangular, and single-walled. Fruit-stalk single, lateral, stout, $4\frac{1}{2}$ –5 inches long, stiff, red, glossy, very flexuous or tortuous (as many as sixteen large crinkles in a single seta). Capsule oblong, 3-sided, gibbous above, $2\frac{1}{2}$ lines long, sub-erect, green, constricted below mouth, margin of mouth bright-red; operculum large, conical, very obtuse, pale; calyptra very small, reddish-brown, naked, base narrow and much lacerated, very slightly hairy near base and at extreme tip, but only perceptible under a good lens.

Hab. On sides of gulleys, eastern slopes of the Ruahine mountain range, County of Waipawa; November, 1885:
Mr. H. Hill. [283]

Obs. This is a very striking species of *Polytrichæ*, from the extreme length of its tortuous, thick, and richly coloured seta; its leaves, too, are much more of a pleasing green colour than is usual in this genus; while its capsule and calyptra also differ from those of its New Zealand congeners. Its nearest ally among our known southern *Polytrichæ*, is *P. magellanicum*, Hedw., from which species, however, it differs considerably. It might possibly fall under *Polytrichadelphus*, C. Muell. (*Cyphoma*, Hook. fil. and Wilson). I have received

several fruiting specimens of this plant from Mr. Hill, in various stages of advancement, yet all possessing the same peculiarly-formed seta.

Genus 71. Hookeria, Smith.

§ Pterygophyllum.

1. *H. macroneura*,¹⁰⁹ sp. nov.

Plant 3–4 inches high, of very close growth, erect, creeping below, much branched, especially at top; stems thick, dark, somewhat woody, densely matted with dark-brown hairs and rootlets; branches flat, forked, spreading, decurved, $\frac{3}{4}$ – $1\frac{1}{2}$ inches long, 5–7 lines wide; stalks thickish above and very hairy to tips; hairs patent, pellucid, white, jointed. Leaves pale-dusky-green, quadrifarious (or somewhat sexfariously disposed), imbricated, large, thin, very obtuse, not marginated, the upper half finely serrate, the lower entire; lateral spreading, orbicular-ovate or broadly elliptic, 2 lines long, dimidiate; dorsal and ventral orbicular, 2 lines diameter; nerve very stout, extending throughout $\frac{3}{4}$ ths of leaf, forked near tip, and sometimes shortly 3-branched there; cells large, oblong-orbicular, much longer at the basal portion, and very much smaller at the margins, strikingly possessing a minute triangular cellule in every angular junction. Perichaetial small, sub-linear-ovate-oblong, rather suddenly acuminate, margin entire, tips truncate with 2–3 teeth, and also 2–3 small teeth near apex; cells linear-oblong, mostly 4-sided. Fruit-stalk 12–14 lines long, erect, flexuous; wiry, twisted, glabrous,

109 *Pterygophyllum dentatum* var. *robustum* (Hook. f. & Wilson)
Dixon.

dark-brown, thickened at top, very slightly muricated or roughish towards top beneath, thickened at base. Capsule oblong, 1½ lines long, dark red-brown, horizontal (much drooping when dry), largely tubercled at base, base thickened but not strumous; teeth, external, dark-brown, very acuminate, incurved, with two prominent dark distant dorsal ridges, and closely transversely barred throughout with denticulate margins, giving their long filiform tips a knotted appearance; internal, pale, acuminate, distantly barred, without intervening ciliæ.

Hab. On the ground, and on rotten sticks, edges of mud swamp; low dark woods near Norsewood, County of Waipawa; 1885: W.C.

Obs. A very fine species, having some affinity with *H. quadrifaria*, Smith; also *H. luteo-virens*, and *H. petrophila*, [284] Col., but very distinct. Leaves remarkably crisp and contracted when dry, but quickly resuming their natural appearance on being wetted.

2. *H. maculata*,¹¹⁰ sp. nov.

Plant small, ¾–1¼ inches high, erect, cæspitose, closely imbricate, much and sub-palmately branched; branches flat, broadest at top, decurved at tips; densely matted below with brown rootlets. Leaves sexfariously disposed, closely imbricate, broadly elliptic, 1½ lines long, all nearly alike, spreading; young leaves pale green, when old spotted at tips of a bronze colour, or each tip bearing a round spot of that colour; margins entire, but under a high power delicately and regularly denticulate; nerve

110 *Distichophyllum microcarpum* (Hedw.) Mitt.

red, very stout at base, extending about $\frac{4}{5}$ ths of leaf, slightly forked near tip; cells sub-orbicular, excessively small except at the centre from middle downwards; there large, open, increasing in size to base, the basal cells sub-quadrately-oblong. Fruit-stalk very short, 1½–2 lines long, black, twisted, flexuous, glossy, thickened at base; few. Capsule minute, about $\frac{1}{2}$ line long, obovate-oblong, sub-erect (horizontal when dry), finely reticulate, sub-tuberculate, sub-apophysate, blackish-brown, glossy, thickened at base. Operculum and calyptra not seen.

Hab. Shaded spots, base eastern slopes of Ruahine mountain range, County of Waipawa; 1885: *Mr. H. Hill.*

Obs. An interesting little species; its regularly spotted appearance giving it a peculiar aspect. It differs much from the other New Zealand species of this genus, its nearest ally being *H. sciadophila*, Col. I have received a large tuft of it from Mr. Hill, containing many plants, but as there were only three fruiting specimens, I did not break up one of them to ascertain the structure of the peristome and perichaetal leaves. When the old leaves below decay, or are gnawed by some insect, the red nerves are left, presenting another peculiar appearance.

ORDER V. HEPATICÆ.

Genus 7. Gottschea, Nees.

1. *G. dichotoma*,¹¹¹ sp. nov.

111 *Schistochila nobilis* (Hook.) Trevis.

Plant large, procumbent and sub-pendulous, dichotomous, 8–9 inches long, much branched; branches repeatedly forked, spreading largely, leafy, 1–5 inches long, $\frac{1}{2}$ inch wide, light-green, flaccid; stems stout, cylindrical, woody, blackish, naked and rigid below. Leaves somewhat distant, free, imbricated, oblong-ovate, finely serrulate; ventral (or under) obtuse, very thin, flat, not plaited, ciliate on upper basal margin; dorsal (or upper) wavy, rumpled, margins slightly irregular, upper basal portion very broad, round, and overlapping, apex very acute, free; in their axils 2–3 small, narrow scale-like leaves, much ciliated. Stipules large, nearly 2 lines wide, situate within (or [285] above) the junction of leaves with stem, sub-orbicular-ovate, deeply emarginate, the upper half slightly and irregularly cilioserrate, the lower entire; stipules on branchlets sparingly ciliate; ciliæ jointed. Cellules very small, distinct, compact, of irregular sizes and shapes, mostly rounded, sometimes sub-rectangular, extending also into the teeth.

Hab. On a rotten stump, forming a large handsome hemispherical clump, completely hiding its support, and with nothing else growing mixed with it, in a forest swamp among fern trees (*Dicksonia squarrosa*), near Norsewood, County of Waipawa, and only seen in that one spot; October, 1885: W.C.

Obs. This is a remarkably fine species, perhaps our largest; it has close affinity with *G. nobilis*, Nees, and might easily be taken for it at first sight. It differs, however, in its much larger size, in its procumbent sub-pendulous habit, and in being repeatedly forked; also, in the different shape of its leaves (both lobes, the upper

lobe being also waved and rumpled), in their being more distant and open, and much less and more finely serrulate; in the stipules also being entire in their lower half; and especially in the areolæ being of a widely different shape, very minute and distinct. Fruiting specimens not seen.

Genus 24. Fossombronia, Raddi.

1. *F. macrophylla*,¹¹² sp. nov.

Plant creeping, rather large, spreading 2–3 inches each way, overlapping, much and dichotomously branched, succulent, very fragile. Branches stoutish, dark-coloured, with many dark-purple long rootlets below; branchlets 4–9 lines long, usually naked above in the middle. Leaves sub-erect, crowded, wavy and rumpled, highly membranous, papillose, shining, green, sub-reniform-quinquangular, 2½ lines broad above, sessile, amplexicaul laterally, margins sub-excised-sinuate, with about five small equidistant angles, sub-acute and minutely apiculate; tips of branchlets sub-rosulate; cells large, broadly-oblong and sub-orbicular-quadrata. Perianth large, erect, campanulate, open, wavy, margins slightly laciniate. Fruit-stalk erect, stout, 6–8 lines long, white; capsule globose, finely papillose, dark-purple; spores and elaters rich dark-brown; the helices of elaters minute and largely gibbous. On the capsule bursting, the broken shell is reflexed on the stalk, and the spores and elaters form a large globular ball.

112 Not found.

Hab. Damp shaded spots, ravines, east slopes of Ruahine mountain range, County of Waipawa; 1885; *Mr. H. Hill.*

Obs. A species near to *F. nigricaulis*, Col.

Genus 28. Podomitrium, Mitten.

1. *P. smaragdinum*,¹¹³ sp. nov.

Plant dark-green, procumbent, of dense growth, slightly creeping, much and loosely overlapping and overgrowing; fronds [286] or lobes horizontal, drooping, scarcely sub-erect, very irregular, of various shapes and sizes, $\frac{1}{2}$ inch to 2 inches long, 2 lines broad, mostly ovate-acuminate and linear-ovate, obtuse and emarginate, sometimes stipitate, wavy and rumpled, smooth, shining; midrib stout, succulent, not clearly defined save at base, with fine, short, brown rootlets on the lower portion; margins thin, entire; frond much thicker on each side of the costa, tips often proliferous; sometimes several small fronds or lobes issue from a kind of flat rhachis, and then it possesses a somewhat sub-pinnatifid and forked appearance, lobes linear-acuminate; cells oblong, transverse. Fructification 1–3, from each side of midrib base of frond below. Involucr short, slightly tumid at base, with a few broad, obtuse, laciniate scales, shallow-cup-shaped, closely adhering, highly cellular, largely laciniate; laciniae serrate, decurved. Perianth 3–3½ lines long, greenish with a purple-pink hue below, stout, slightly curved, smooth, shining, finely striate, cylindricale narrowed and many plicate at apex, mouth laciniate; laciniae long, slender, wavy; cells linear-oblong, barred. Fruit-stalks 1½–1¾ inches long, stoutish. Capsule

113 *Podomitrium phyllanthus* (Hook.) Mitt.

1½ lines long, cylindrical, brown-purple, smooth, shining; valves linear, sub-acute, cohering strongly at tips after bursting; tips thickened; cells narrow-linear, thickened at ends. Elaters very numerous and long, twisted, enclosed, (somewhat like those of *Lejeunia* and *Pellia*—*teste* Dumort's figs.,) much implexed and crumpled, brownish, ends sub-acute; on the capsule bursting, the elaters remain in a largish globular, fluffy ball, covering the whole capsule. Spores orbicular, smooth, brownish-green, centre depressed, edges entire. *Male:* a few antheridiæ, sessile on each side of midrib below, under a broad sub-flabellate scale, margin sinuate and serrate, generally opposite in pairs and near the base, but sometimes on the stipe and sometimes scattered, 2–8 on a frond.

Not being satisfied with the comparatively low power of my own microscope, I applied to Dr. Spencer, who has an excellent and powerful compound one, (which he has also used so very effectually in describing the fresh-water *Algæ* of New Zealand in his papers in past volumes of "Trans. N.Z. Inst.,") and Dr. Spencer has very kindly examined the fruit, etc., of this little plant, and has also sent me the following interesting and copious description, which, with much pleasure, I bring forward here:—

"The elaters are very beautiful objects, they give one the idea of a double cord twisted into two helices; with a high power, a distinct but exceedingly fine membrane is seen surrounding the loops, not straight but following their sinuosities. The spores are circular, edges quite smooth, outline double, with cellular space between the

two contours. Elaters, length $\frac{1}{36}$ ", breadth $\frac{1}{1900}$ ". Spores, breadth $\frac{1}{950}$ " to $\frac{1}{1900}$ ". (Dr. Spencer *in lit.*) [287]

Hab. On the earth at water's edge, in a deep, narrow, and dark glen (in which the sun never shines); forest, near Matamau, County of Waipawa (barren); 1883: and also in a swamp, in dense forest near Norsewood, same county (in fruit); 1885: W.C.

Obs. I. This species, though allied to *P. phyllanthus*, Mitt., differs pretty considerably from that plant, and that in several particulars—*i.e.*, from its description as given in "Flora N.Z.," and in the "Handbook Fl. N.Z.," and from the drawings and dissections of that plant, with description, as originally given by Sir W.J. Hooker in his "Muscí Exotici." There is, however, another and similar plant, (discovered here in New Zealand by myself, and fully described by Hook. fil. and Taylor, in the "London Journal of Botany," 1844, as *Diplolæna cladorhizans*; and afterwards described in the "Synopsis Hepaticarum" as *Blyttia cladorhizans*,) to which this present one is very much more closely allied. But Mitten, in those two works on New Zealand Botany above named, has subsequently united those two plants (formerly "2 species and 2 genera") as being but one species: to this, however, I cannot agree. And it is worthy of notice that both Sir J.D. Hooker and Dr. Taylor, who well knew those two plants and published them, had considered them to be very distinct; although, from what they say, they evidently had not seen *Diplolæna cladorhizans* bearing perfect fruit: moreover, those able cryptogamists, the authors of the "Synopsis Hepaticarum," while disagreeing as to their being two genera, made two distinct species of them. For

my own part, I think that Mitten has united two plants under his *Podomitrium phyllanthus* (l.c.), which, by his own showing there, might very easily be done. But be that as it may, of one thing I am pretty sure, that this plant I have now described in this paper is a very different one from that originally discovered in New Zealand (Dusky Bay) by Dr. Menzies, in 1791, and published by Sir W.J. Hooker in his "Musci Exotici" as *Jungermannia (Podomitrium) phyllanthus*.

Obs. II. This little novelty has caused me no little labour and research; for from my first detecting it in its darkish home (a deep rift in the earth at the head of a low forest gulley between two mountain spurs, a place, too, very dangerous of access, or, rather, to get out from, owing to its perpendicular and crumbling sides and nothing serviceable to lay hold of), I believed it to be something new; but it was barren, and not unlike other and known small frondose *Hepaticæ*; subsequently I sought flowering specimens in that spot but failed. I was much pleased in again unexpectedly meeting with it in a new locality, and beginning to show fruit! I brought a good sized portion carefully away, and in about a month it became fully developed.

**1885 A brief List of some British Plants (Weeds)
lately noticed, apparently of recent
Introduction into this Part of the Colony; with
a few Notes thereon. *Transactions of the New
Zealand Institute* 18: 288-290.**

[Read before the Hawke's Bay Philosophical Institute,
14th December, 1885.]

IN my travels or wanderings on foot during the last 2–3 years, mostly in and about the Seventy-mile Bush and its neighbouring localities, I have occasionally stumbled on a British plant that I had never seen before in New Zealand, that is since I left England, upwards of fifty years ago. On three occasions in particular I was at first, and for some time after detecting the plant, induced to believe that I had gained something additional to our indigenous Flora; but on examination, etc., I found out my mistake. I shall, however, only mention those few that are of recent introduction, at least here in Hawke's Bay; as far too much, in my opinion, has been already often said and repeatedly published respecting those British and Australian weeds, which have long been established in New Zealand, some of them even before it became a British colony! otherwise I might easily do as others have done before me: make out a long and wearisome reiteration or useless catalogue of hard names.¹¹⁴

On the contrary (and as Sir J.D. Hooker in writing on this subject has shown), an increase of knowledge, if not a

114 Colenso is here ridiculing GM Thomson's paper.

real benefit, is obtained, by noting the fact of the *introduction* or *first notice* of any of our Home and foreign common weeds into the colony.

Ranunculaceæ.

Ranunculus hirsutus, Curt. (Pale Hairy Crowfoot). Only one plant, and that a very large one, quite a little erect bush of above a foot high, containing very many flowers. (This is one of the three plants already alluded to, that on first sight I supposed to be indigenous, it had so much in common with our larger New Zealand *Ranunculi*.) In an open sunny watercourse near Norsewood; 1884.

Cruciferæ.

Coronopus didyma, Sm. (Wart Cress). A single plant only, but a pretty large prostrate one. This plant is not generally spread at Home, being confined to the southwest of England. I found this during the present summer (1885) at Napier.

Camelina sativa, Crantz. (Gold-of-Pleasure). Of this also I only detected a single plant, and that a few years ago near Napier; it was of large size (for the species) and full of flowers and fruit; I have not observed it since. I gathered and dried the whole of it. Its common English name seems wonderfully misplaced. [289]

Lineæ.

Linum angustifolium, Huds. (Narrow-leaved pale Flax). First observed this summer here in Napier.

Hypericineæ.

Hypericum androsænum, Linn. (Tutsan; Park-leaves). One fine plant only here at Napier, in my field; first observed at Christmas, 1884, bearing flowers and fruit.

Umbelliferæ.

Torilis nodosa, Sm. (Knotted Hedge Parsley). One small plant only seen, and that in a very strange out-of-the-way spot for a foreign weed to be found in, at the base of a high cliff, side of the River Mangatawhainui, Seventy-mile Bush; 1884. This little plant gave me some trouble; for, on my first meeting with it (young and leaves only), I supposed it to be *Daucus brachiatus*, Sieber, (an indigenous common northern plant that I had never met with in these parts,) or, something new; so I watched it carefully. On a subsequent visit I procured a tiny bit in flower, and on a still later visit its curious fruit, when I soon found out what it was.

Rubiaceæ.

Galium aparine, L. (Goose-grass, or Cleavers). This fine species of *Galium* grows strongly here at Napier. First noticed in 1884.

Compositaceæ.

Crepis pulchra, Linn. (Small flowered Hawk's Beard). Sparingly in my field at Napier.

Crepis tectorum, Linn. (Smooth Hawk's Beard). With preceding; this plant becomes a biennial in New Zealand. At first I had supposed this plant to be a *sp. nov.*, from its large size and woody stems, and being a perennial.

Hypochaeris glabra, Linn. (Smooth Cat's-ear). With preceding; first noticed in 1884.

Lapsana communis, Linn. (Common Nipple-wort). In one spot only, in an open grassy glade in a thick wood, south of the River Mangatawhainui, near Norsewood; first noticed in 1883.

Arctium lappa, Linn. (Burdock; Clot-Bur). I first saw this plant in 1882, in a dense and unfrequented part of the Seventy-mile Bush. There was only one plant of it, a young one, having 2–3 large prostrate leaves resembling rhubarb. I could not tell what to make of it! I gazed on it with astonishment, much like Robinson Crusoe on seeing the print of a human foot in the sand! I had seen nothing like it in New Zealand. [To the best of my recollection I had never seen the burdock growing in England.] I visited that one plant several times during the first six months, with great expectations, but [290] could make nothing of it, as during that period it showed no signs of flowering. Subsequently, however, it flowered. I collected and dried specimens, and brought them to Napier, not, however, without some amount of misgiving. On due examination, I found out what it was. Unfortunately I did not go again to those localities until the following Spring; and, as it had seeded plentifully, and the cattle had got into that wood, they carried off its sticky burs in all directions; so that from that *one* plant hundreds have been disseminated, filling the neighbourhood with a much worse weed than the introduced thistle. Like many other of the foreign weeds, it flourishes exceedingly, and grows to a very large size, 4 feet high, thick, bushy and strong, insomuch that a few plants growing together offer quite an obstacle to the traveller that way.

Among sundry other plants of this extensive and easily introduced Order, that have also found their way here during the last few years, (although previously known in other parts of the colony,) may be mentioned:—

Chrysanthemum leucanthemum, Linn. (Great Ox-eye). In great quantity about Waipawa and Waipukurau, quite whitening the fields at Woburn with its flowers.

Achillea millefolium, Linn. (Common Yarrow or Milfoil). At Norsewood; where, however, it bears purple flowers, and looks well.

Centaurea solstitialis, Linn. (Yellow Star-thistle; St. Barnaby's Thistle). Napier.

Labiatae.

Prunella vulgaris, Linn. (Self-heal). This weed, long known in the north of New Zealand, I first noticed about five years ago, and then only a few, and in two or three adjoining spots. When I first saw it, being young and only showing leaves, I did not recognise it. On a subsequent visit it was in flower. In the following year I was again sojourning in that same locality (Seventy-mile Bush), when one day a gentleman drove up to the house where I was; he had been up in the forest collecting ferns and plants for his garden, and among others he had carefully taken up some young *Prunella* plants; but on my telling him what they were, he quickly abandoned them. This plant, too, has spread wonderfully in a short time, supplanting, overrunning, and destroying the low indigenous herbs; which is the more easily done through it being a perennial.

1885 On *Clianthus puniceus*, Sol. *Transactions of the New Zealand Institute* 18: 291-295.

[Read before the Hawke's Bay Philosophical Institute, 14th December, 1885.]

FOR many years this truly handsome plant has at various times largely occupied my thoughts. Partly from its great beauty and comparative variety; partly from the large and cosmopolitan Order to which it naturally belongs, *Leguminosæ*, (so common in the neighbouring countries of Australia and Tasmania,) being so poorly represented in New Zealand; and partly from its genus being small and almost endemic. Indeed, I might go almost a step further, and add, that there is a kind of veil or mystery shrouding it, which hereafter may be clearly explained. In few words, that "mystery" is this: that I have never met with it growing truly wild and common, as all the other indigenous plants are found, although it may have been, like some of our genera, originally confined to one special area. Indeed, I think that, had it not been early raised from seed and generally cultivated by the colonists, (as well as at Home,) it would very nearly have become extinct, like some other New Zealand plants. And in this respect it seems to me to belong to that small class of esteemed plants that were long and assiduously cultivated by the ancient Maori people—viz.: the Taro (*Colocasia antiquorum*, Schott.), various sorts; the Kumara, or sweet potato (*Ipomoea chrysorrhiza*), many varieties; the Aute (*Broussonetia papyrifera*), Paper Mulberry; the Tamure, or Awanga (*Phormium colensoi*), var., striped New Zealand Flax; and the Tipara

(*Cordyline*, sp. undescribed), Broad-leaved Cabbage-tree. In one or two points, however, the *Clianthus* differs widely from them: (1) It bears seed abundantly; and, (2), it flourishes in almost all spots where it has been planted. Yet, in connection with this, I may observe that, although I have not unfrequently noticed a large shrub of *Clianthus* bearing hundreds of fruitful pods of seeds, that were left on the plant to ripen, burst, and fall to the ground, I have scarcely seen an instance of any of those many seeds springing spontaneously from beneath or around the parent plant; and this great peculiarity obtains also in a large measure among the *Phormium* species.

On my arrival in New Zealand, (Bay of Islands, 1834,) I first saw this fine plant in full bloom in the gardens of the missionaries; naturally I was struck with its imposing appearance, as I had never seen it, nor anything like it, before; indeed at that time it was scarcely known at Home. I very soon cultivated it in my own garden. In all my travels at the North, extending over several years, and crossing and recrossing the country in all directions, I never met with the *Clianthus* growing [292] wild or naturally, save on two or three of the smaller islets in that Bay,—notably on a small islet named Taranaki, in the mouth of the Kerikeri River. I have also seen it occasionally in deserted food plantations, and near the residences (occupied or abandoned) of the old Maoris; still it was a plant very well known among them.

The plant, however, was early seen in New Zealand by Cook and his co-voyagers, on his first voyage, and no doubt on this East Coast, and perhaps more than once at the different places where he touched and went on shore

on that voyage, the time of the year being that of the flowering season of this plant—as at Tolaga Bay, Mercury Bay, and the Bay of Islands. Specimens of the plant were at that time taken Home by Sir Joseph Banks and Dr. Solander, and the plant was named *Cianthus puniceus* by Dr. Solander, who established its genus. Forster, who accompanied Cook on his second voyage, (and who has done so much towards making known the botany of this country,) probably never saw it, although here in the proper season for observing it, as his visits were confined to the South Island, where, I have reasons for believing, the plant was not originally found. The more modern botanists, also, as Lesson and Raoul, whose researches and discoveries were mainly confined to the South Island, make no mention in their works of having met with it; and the two Cunninghams, who were also early in New Zealand at the North, and who spent some time there (especially Richard Cunningham), also never saw it.

However, it was first published by George Don, in 1832, in his “General System of Botany,” who changed its original name of *Cianthus* (known also to him) to *Donia punicea*. His description of the plant is a good one (a portion of its character I extract):—“*Vexillum* ovate-lanceolate, acuminate, rather shorter than the keel, reflexed; *Wings* lanceolate, acuminate, half the length of the keel,” etc. “Native of New Zealand, where it was first discovered by Sir Joseph Banks and Dr. Solander, who gave it the name of *Cianthus puniceus*.” (*loc. cit.*, vol. ii., p. 468.) Of course, Don could only have known of those New Zealand specimens from which he drew up his description; he does not say why he changed the name of

the plant given to it by its discoverer, which, curiously enough, he also gave *his own name* to! though he says it was “named in honour of Mr. George Don, of Forfar,” his own father.

This was followed by Dr. Lindley, in 1834, in a more elaborate account of this plant, in a paper “read December 2, 1834,” before the Horticultural Society of London, and published in 1835, in their “Transactions,” 2nd series, vol. i., p. 519, accompanied with a large and well executed coloured drawing of it, from the pencil of the celebrated flower painter, Miss Drake. This drawing, I may further observe, was taken from [293] a fresh specimen of the plant “raised in England from seed gathered by the missionaries in New Zealand, where it is said to be called ‘Kowhaingutu-kaka,’ or Parrot’s-bill, and to grow to the size of a large tree” (*sic*)—“in England, however, it has not reached beyond 4 feet in height.” The coloured drawing of the plant is a bold, clear, and good one, and shows the flowers much as Don had described them, with their “wings lanceolate and acuminate.” At that time Dr. Lindley restored to the plant its original name of *Clianthus puniceus*, which it has properly retained ever since.

During my early visits to the East Coast, but always late in the summer, (1838–1843,) landing at Wharekahika (Hicks’ Bay), and travelling on foot to Poverty Bay, in and out among the Maori villages, I noticed a few scattered plants of *Clianthus*, though much as I had formerly seen them in the North.

In 1844 I came to Hawke’s Bay (second time) to permanently reside, and it was not very long before I

obtained plants of *Cianthus* (from seed or cuttings) from the Maoris for my garden. In due time, when these grew and flowered, I noticed a marked difference between their flowers and those of the northern plant, with which I was so well acquainted. At first I did not pay great attention to it, having vastly too much of other and more important matters to attend to, but in course of time, and as my plants grew so tall and to such a large size, I examined them a little more closely, and then I discovered what I believed to be a true specific difference, or, at all events, showing a marked variety, if the newly-detected characters should prove constant. Somewhere in the decade of 1840, I sent specimens of this southern form of *Cianthus* (with other plants) to Kew, to Sir W.J. Hooker, calling his attention to the differences I had noticed; in the course of (say) the following year, Sir W.J. Hooker, in reply, said that they at Home who had examined the dried specimens sent could not detect any material difference.

After that time the matter slept, as far as I was concerned. Of late years, however, having the southern form (as I call it) always here in my own garden, and seeing it generally plentifully cultivated in gardens in this town, and in the adjacent country villages and other places, I have been led again to closely examine the plant, and I have found that those differences I had formerly detected still continued. I, therefore, obtained both seeds and plants of the northern form from Auckland, and this year the plants have flowered in my garden; and now, having the opportunity of comparing closely the two forms in a living state, I give briefly the result of my old and new

examinations, which will serve sufficiently to point them out.

1. *Clianthus puniceus*, Sol. (*vera*: N. form).

Flower 3 inches long, $1\frac{1}{4}$ inch broad; standard ovate, very [294] acuminate, sides nearly straight, claw long; wings lanceolate, acuminate, acute; colour a clear lively scarlet.

2. *Clianthus maximus*,¹¹⁵ Col. (S. form).

Flower 2– $2\frac{1}{4}$ inches long, $1\frac{1}{2}$ inches broad; standard broadly ovate, acuminate, sides rounded, claw short; wings somewhat oblong, broad, very obtuse (rounded) at apex; colour a less clear red, verging to more of a dark or crimson hue, with a large dark spreading blotch at base of the standard; flower broader; and the substance of the petals, especially the keel, thicker, more coriaceous or skinny, and finely wrinkled. The leaves also of this species are larger, some leaflets measuring more than two inches; these are also more membranous and glabrous than in the northern form; and the whole plant is stouter, rises higher, generally from 6 to 10, or even 12, feet.

The principal differences, however, which are clearly apparent at first sight, (especially if the flowers of the two forms are compared together in a living state), consist in their relative sizes, in the shape of their standards, and more especially in their wings, and also in their colours; but whether those differences, though constant, are sufficient to constitute two separate species,

115 *Stet.*

or merely varieties, is of little consequence to me—the two forms exist.

And here I may further remark (having very frequently of late years noticed it), that several of our indigenous New Zealand plants, and in particular of genera of which it had always been believed that New Zealand possessed but *one* species of each genus, have now, at least, *two* species to each genus; or if not exactly (and beyond all controversy) two species, seeing that the limit of a species can scarcely be clearly defined, then two forms; the southern form being very distinct from the northern one, yet pretty closely resembling it in general appearance. And this I have especially noticed to take place in the Orchid Order: *e.g.* *Dendrobium*, *Sarcochilus*, *Bolbophyllum*, *Gastrodia*, *Earina*, *Microtis*, and *Orthoceras*; to which may be added *Gratiola*, *Dianella*, *Arthropodium*, *Tupeia*, *Australina*, *Hoheria*, and many others.

To this mysterious subject, however, of dimorphism (found here again in *Clianthus*), I hope to return on some future occasion.

In conclusion, I may add, that Lindley's description of *Clianthus puniceus* agrees with the coloured drawing of the English cultivated one already referred to, in which the *alæ* or wings are correctly shown to be lanceolate acuminate with acute tips. A. Cunningham's description of the same, in his "Prodromus Novæ Zealandiæ," (published several years after, 1839), in "Annals of Natural History," vol. iii., p. 246), is drawn, as he shows, from two sources, the one being "Solander's MSS. [295] in Bibl. Banks," and the other Dr. Lindley's description

already mentioned; as at that time of Cunningham's writing his valuable paper in England, he had not seen the plant growing in New Zealand,—although he did afterwards in my garden and elsewhere. Sir J.D. Hooker, in his "Flora Novæ Zelandiæ," in describing *Clianthus puniceus* gives the following: (1. of the genus), "Vexillum ovatum, incumbens v. reflexum, carinam oblongam cymbiformem æquans: alæ lanceolatae, basi exciso auriculatæ, carina breviores;" and (2. of this species), "Standard ovate, slightly recurved, as long as the keel. Wings lanceolate, sub-falcate, sharp, twice as long as the standard, 1½–2 inches long." Here, however, while his description of the shape of the wings is quite correct, and in agreement with both Don and Lindley, above, viz., "Wings lanceolate, sharp;" there is a manifest error with regard to their size—"twice as long as the standard." This latter is corrected in his "Handbook," published several years after (1864), and altered to "half as long as the standard;" while the former description of the shape of the tips of the wings is also altered from "sharp" to "acute or obtuse;" evidently, as I think, to embrace the two states or forms (whether species or varieties) to which I had early called his attention.

Napier, December 10th, 1885.

P.S.—Living flowers of both plants, with mounted dissections showing the diverse forms of their parts, as described in this paper, were exhibited at the ordinary meeting of the Hawke's Bay Philosophical Institute in October, 1885.—W.C.

**1886 A Description of the curiously-deformed
Bill of a Huia, (*Heteralocha acutirostris*,
Gould), an endemic New Zealand Bird.
Transactions of the New Zealand Institute 19: 140-
145.**

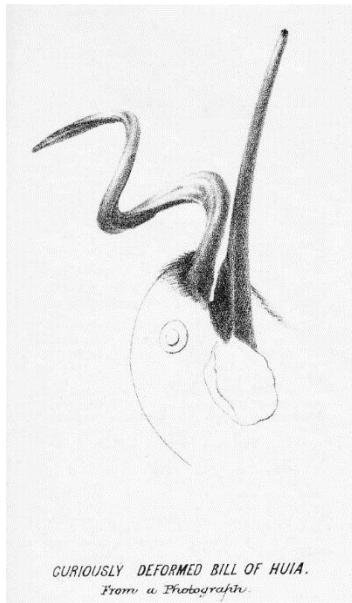
[Read before the Hawke's Bay Philosophical Institute,
9th August. 1886.]

A SHORT time ago I received from a kind correspondent, a settler dwelling in the interior forest-land, the head of a Huia in a fair state of preservation, which he had then recently obtained from a Maori. This head is that of a female bird; the upper mandible of its bill being greatly and strangely deformed. From about 1 inch, or one-fourth of the normal length of the upper mandible from its base, it suddenly rises and remains at an angle of 45°, forming a regular ascending and suberect spiral of two large and equal curves, each being of $\frac{3}{4}$ -inch open interior diameter; not unlike a gigantic corkscrew, and reminding one of the horn of the *Strepsiceros*. (See Plate IX.)

The total length of this deformed mandible, following the curves, is just 6 inches; its breadth at the widest part about the middle is 4 lines, which part is also flat above, and is devoid of nostrils; and its end or tip is sharply pointed, and vertical upwards; throughout its whole length it is much thicker, rounded, and very obtuse on the right side or edge, while the left edge is thin and sharp; the lower thin marginal base of the right edge of the mandible is also much produced and sharp, evidently larger than ordinary, arising from, I think, not having been worn away in use; while the corresponding opposite edge is much worn, being almost the only part of the

upper mandible that could possibly be brought into serviceable contact with the lower mandible; its colour, too, is not that sure ivory-white of the healthy and normal bill, but more like that of common whitish horn.

The lower mandible is $2\frac{3}{4}$ inches long, being very much shorter and not so much curved as this portion of the bird's bill is in the normal state. The tip, too, is much more blunt, and is slightly worn or broken; on the left edge near the base is a tolerably large, worn depression or notch, where the upper mandible must have closed upon it in the efforts of the bird on receiving its food.



CURIOUSLY DEFORMED BILL OF HUIA.
From a Photograph.

Plate IX.

There is not the least indication of the upper mandible ever having been broken or bruised, and afterwards, in healing and using, grown out of its common natural form, and thenceforward assuming its present shape. The inference, therefore, is [141] that this bird must have been hatched with this peculiarly aberrant upper mandible; and, while we may reasonably suppose the parent birds assiduously fed it for some considerable time beyond the usual period of their young remaining unfledged, still, how it afterwards could have managed to exist and grow up seems truly wonderful! Especially when we consider the usual native food of the Huia, which consists of the larvæ of some of our largest beetles, (e.g., *Prionoplus reticularis*,) obtained by the bird industriously pecking and probing rotten logs and wood, much after the manner of the common Woodpecker. Besides, from its very strange configuration, it appears to have been far worse than merely useless, for it must have been always an obstacle in the way, and the means of keeping the bird's mouth always open.

From the general appearance, as well as from the extreme length, of this upper mandible, I should infer the bird to have been an aged one; for, according to Dr. Buller, the length of the bill of the female bird is from 4 to 4½ inches; but this upper distorted and unused mandible is no less than 6 inches long, while the lower one, which should correspond as to length, is only 2¾ inches! So, here we have two patent facts: 1, that the upper amorphous mandible grew continually, without being worn away through use; and, 2, that the lower one, having extra and constant work to perform, was

consequently worn down and made defective far beyond its normal state and its natural power of growth-producing horn.

I have said that this head had belonged to a female bird: this is known by the greater length of the bill of the female bird, which is also narrower and much more curved than that of the male. For, while the bill of the female ordinarily measures about $4\frac{1}{4}$ inches, that of the male is only $2\frac{1}{4}$ inches, and is much more stout and strong, more wedge-shaped, and, consequently, less curved. Indeed, so great is the difference existing between the male and female birds in the form and length of their bills, that formerly, and for some considerable time, owing to their rarity and the scarcity of good specimens, the two birds were by our first ornithologists at Home believed to constitute two distinct species, and were consequently published as such.

I have already remarked that it seems almost a mystery how a bird with such a strangely deformed and all but useless bill could have managed to obtain its native food, so as to subsist and grow. We may, however, obtain a little light on this somewhat dark subject from an interesting paper on the Huia, written by Dr. Buller some 15 years ago for the Wellington branch of this Institute, and published in the third volume of their "Transactions;" Dr. Buller having had the peculiar and almost unique advantage of observing for more [142] than a year the habits of these birds while living in confinement; and from his pleasing paper I shall quote a few passages bearing more particularly on this part of my subject.

In the beginning of his paper, Dr. Buller observes:—

“Their peculiar habits of feeding, which I have described from actual observation, furnish to my own mind a sufficient ‘reason’ for the different development of the mandibles in the two sexes, and may, I think, be accepted as a satisfactory solution of the problem. In the summer of 1864 I succeeded in getting a pair of live birds. I kept these birds for more than a year; and when the male bird was accidentally killed, the other, manifesting the utmost distress, pined for her mate and died ten days afterwards.”

“The readiness with which these birds adapted themselves to a condition of captivity was remarkable. Within a few days after their capture they had become perfectly tame, and did not appear to feel in any degree the restraint of confinement; for, although the window of the apartment in which they were kept was thrown open and replaced by thin wire netting, I never saw them make any attempt to regain their liberty.”

“They were fully adult birds, and were caught in the following simple manner. The Maori who had caught them attracted the birds, by an imitation of their cry, to the place where he lay concealed; then, with the aid of a long rod, he slipped a running knot over the head of the female and secured her. The male, emboldened by the loss of his mate, suffered himself to be easily caught in the same manner. On receiving these birds, I set them free in a well-lined and properly-ventilated room, measuring about 6 feet by 8 feet. After feeding freely on the *huhu* grub, a pot of which the Maori had brought with

them, they retired to one of the perches I had set up for them, and cuddled together for the night."

"It was amusing to note their treatment of the *huhu*. This grub, the larva of a large nocturnal beetle (*Prionoplus reticularis*), which constitutes their principal food, infests all decayed timber, attaining at maturity the size of a man's little finger. Like all grubs of its kind, it is furnished with a hard head and horny mandibles. On offering one of these to the Huia, he would seize it in the middle, and, at once transferring it to his perch and placing one foot firmly on it, he would tear off the hard parts, then, throwing the grub upwards to secure it lengthwise in his bill, would swallow it whole. . . . I sent to the woods for a small branched tree, and placed it in the centre of the room: it was most interesting to watch these graceful birds hopping from branch to branch, displaying themselves in a variety of natural attitudes, and then meeting to caress each other with their ivory bills, uttering at the same time a low affectionate twitter."

[143]

"But what interested me most of all was the manner in which the birds assisted each other in their search for food, because it appeared to explain the use, in the economy of nature, of the differently formed bills in the two sexes. To divert the birds, I introduced a log of decayed wood infested with the *huhu* grub. They at once attacked it, carefully probing the softer parts with their bills, and then vigorously assailing them, scooping out the decayed wood till the larva or pupa was visible, when it was carefully drawn from its cell, treated in the way described above, and then swallowed. The very different

development of the mandibles in the two sexes enabled them to perform separate offices. The male always attacked the more decayed portions of the wood, chiselling out his prey after the manner of some Woodpeckers, while the female probed with her long pliant bill the other cells, where the hardness of the surrounding parts resisted the chisel of her mate. Sometimes I observed the male remove the decayed portion without being able to reach the grub, when the female would at once come to his aid, and accomplish with her long slender bill what he had failed to do. I noticed, however, that the female always appropriated to her own use the morsels thus obtained. For some days they refused to eat anything but *huhu*, but by degrees they yielded to a change of food, and at length would eat cooked potatoe and raw meat minced up into small pieces."

Dr. Buller also goes on to say that "Dr. Dieffenbach, in forwarding his specimens of the Huia to Mr. Gould in 1836," [error, *lege*, 1839–41] "wrote:— 'These fine birds can only be obtained with the help of a Native, who calls them with a shrill and long-continued whistle, resembling the sound of the Native name of the species. After an extensive journey in the hilly forest in search of them, I had at last the pleasure of seeing *four* alight on the lower branches of the trees near which the Native accompanying me stood. They came quick as lightning, descending from branch to branch, spreading out the tail and throwing up the wings.' (*l.c.*). From Dr. Dieffenbach seeing *four* on that occasion, I have little doubt of their being two pairs.

Moreover, and in further confirmation of much of the foregoing, I may briefly add what have at various times in past years, while travelling, come casually under my own notice respecting this bird. In some year in the decade of 1850 (I forget the exact one), I was, as usual, returning on foot from my annual journey to Wellington by the coast line, when one morning early, on the beach by the side of a small stream near Cape Turakirae (the west head of Palliser Bay), I suddenly came upon a single Maori, who had just then taken six of these birds, three males and three females; some were dead, killed in the capturing, and some were still alive. He told me that he [144] had seen them there on the low-stunted *karako* trees (*Corynocarpus lœvigata*) the day before; and so, having prepared his materials, had returned thither early that morning, and had succeeded in taking them.¹¹⁶ I am, however, not certain (now) that he had captured all. I might have bought them from him for a small sum, but I was too far away from my home in Hawke's Bay, with a long and heavy journey before me, and had no means at hand for preserving their skins. At that time (before, and for many years after), there lived at Mataikona, near Castle Point, a very curious eccentric old Maori chief named Pipimoho—a true type of the skilled old Maori *tohunga*, or knowing-man! Pipimoho was the only one in these parts who knew how and where to capture these birds; and this for a long time was his annual occupation, once or twice in the year to go to the inland forests from the East Coast, (to Puketoi and its neighbourhood), to

116 WC: The finding of those birds here, far away from the forests and close to the sea-beach, is opposed to Dr. Buller's statement as to their narrow restricted mountain-forest habitat. (*loc. cit.*, p. 24.)

snare the Huia; and this was done to supply the principal chiefs of Hawke's Bay—Puhara, Te Hapuku, and Hineipaketia, his superiors in rank. This quaint old man only died about three years ago. From him I have received many a curious and interesting relation, always wishing I had more spare time at command to obtain more.¹¹⁷

I have also seen this bird in captivity with the Maoris, kept in a large light cage of network for the sake of its tail-feathers (*rectrices*), which were plucked as they arrived at maturity; the Maoris fed them with cooked potatoes, and other similar soft vegetable food.

Dr. Buller, in the same paper, also mentions, and gives the figure of, a larger and more highly curved form of the bill of the female bird than is usually met with. (*Loc. cit.*, tab. iii., fig. 3.)

Further, I may also briefly state that, among the Parrots, the Maori Kaka, (*Nestor meridionalis*, Gml.), which I have formerly seen kept in confinement by the Maoris, I have noticed a few with very deformed upper mandibles; those birds had been kept by them for several years, and were aged, and being fed only (and sparingly!) on soft vegetable food, generally cooked potatoes, their bills, from want of their regular natural attrition on the harder substances of the forest, became overgrown and deformed. Indeed, the poor prisoners had not the common chance allowed them of biting and tearing their perch, or any wood (and this from mere thoughtlessness

117 WC: See "*Trans. N.Z. Inst.*," vol. xiv., p. 54, for a pleasing anecdote concerning him.

and carelessness, or long-continued custom, on the part of their Maori owners), for they were invariably kept fastened by a bone ring or carved circlet around one leg, and thus tied securely, but loosely, with a strong short cord to a slender polished cylindrical hard-wood spear, up and down which, for the space of 2 or 3 feet, the poor bird ran and danced and flapped his wings, always without water, and frequently in the hot burning sun, without any shade. These birds, however, were of great use to their owners for decoying other parrots for food, which through their means were often at set seasons slaughtered in large numbers.

Now, from all those interesting facts and observations relative to the habits and economy of the Huia, we may, I think, gather:—1. That these birds are quiet and social. 2. That they keep together in sexual pairs, and are therefore likely to be monogamous. 3. That the cock and hen are greatly attached to each other. 4. That they naturally and mutually help in their search after their own proper food. 5. That they can and do, without difficulty, make a thorough change in their diet or food, from animal to vegetable substances. And so, I think, we may reasonably conclude that the unfortunate female bird, to whom belonged this unnaturally distorted and almost useless upper mandible of her bill, was helped throughout a long life by her kind and attentive mate.

1886 A description of a large and new species of orthopterous insect of the genus *Hemideina*, Walker.

Transactions of the New Zealand Institute 19: 145-147.

[Read before the Hawke's Bay Philosophical Institute, 9th August, 1886.]

FAM. LOCUSTIDÆ.

Genus *Hemideina*.

***Hemideina longipes*,¹¹⁸ sp. nov.**

Male.—Body smooth, legs and palpi hairy; general colour dark red-brown clouded with black. *Head*, rather small elliptic-globular, slightly wider than prothorax; eyes large, sub-lunate, gibbous, broadest above, horny integument filled with minute quadrangular facets; clypeus ochraceous, transversely rugulose above; labrum large, longitudinally ridged in the centre, minutely pitted and creased, yellowish spotted with dark-brown, with a few small vibrissæ; maxillary palpi very long, about 1 inch, slender, finely pubescent, three last joints nearly equal, last the longest, tip slightly clavate, hollow (?) or extreme point wanting), pale coloured; labial palpi rather short, stoutish, second and third joints of equal length, colour pubescence and hollow tips as in maxillary palpi; antennæ, etc. ... *Thorax* shining: prothorax 5 lines wide, slightly [146] concave, dark-brown mottled with black, and a black transverse band within each margin, edges

118 *Gymnoplectron longipes* (Colenso) Hutton.

thickened, brown; mesothorax and metathorax each $2\frac{1}{2}$ lines wide, dark-brown with blackish mottlings; sternum of thorax, coxae, trochanters, and femora below light-chocolate brown and very glossy, coxae slightly pubescent. *Abdomen* short, rather narrow, sub-compressed, about $\frac{1}{2}$ inch long, seven rings slightly arched, smooth above, sides minutely muricated, dark brown transversely banded with black and mottled with black above; anal appendages two, 5 lines long, slender, subulate, obtuse, curved, light-brown, very hairy almost shaggy. *Legs*: *posterior pair* very long; femur 2 inches long, straight, smooth, largely clavate, outer side convex, unarmed, inner side very deeply grooved, and armed with a row of spines on each edge, edges sharp, glossy, also the spines; 12 spines, distant, in the inner row, and 21 spines, smaller and closer in the outer row; upper part of thigh 4 lines wide, stout, thick, of a light dull-brown colour, smoothish, shaded with darker wavy lines that are minutely hairy (*sub lente*), the lower end dilated laterally into two thin auricled processes, with a minute black spine on each; tibia $2\frac{1}{2}$ inches long, slightly curved, slender, piceous, studded with numerous minute short hairs, giving it a semi-muricated appearance, the inner side convex, the outer deeply grooved and armed on the edges with two rows of acute spines, 16 in the outer row, the uppermost very small, increasing in size downwards, the lower 6 the largest, 12 spines in the inner row, the lower 7 very large and rather slender; at the lower end of tibia 8 spines around the joint, 2 of them small, close above, 2 on each side, one of them being very large, $\frac{1}{10}$ th inch long, and 2 smaller below; tarsus 1 inch long, slender, unarmed save 2 small spines at the lower end of

each joint, the upper joint longest, 4½ lines long, the third very small, and the last 3 lines long, the inner side deeply and narrowly grooved, ending on each joint in a long ovate loop with raised margins and no pulvilli (and so the other two pairs); unguis small, curved, divergent: *middle pair*, femur and tibia each 1 inch long, slender, each having 3 pairs of lateral, small, sub-opposite distant spines, with minute intermediate denticulations or points, and 4 small spines at the lower end of tibia, and two of the same at lower end of femur; tarsus 7 lines long, unarmed, very slender, upper joint longest, 3 lines long; tarsi and tibiæ light-brown, clouded: *anterior pair*, femur and tibia each 13 lines long, grooved; femur slender, unarmed on outside save minute tubercles or blunt denticulations on the outer edge of groove, and 4 small slender spines on the inner edge with similar minute tubercles, and 1 small spine on the lower auricled end on the inside; tibia, 3 pairs small alternate distant lateral spines, and 4 small spines at the [147] lower end of joint, the lower half pale-brown, clouded; tarsus 8 lines long, slender, unarmed, pale ochraceous-yellow with darker joints.

Hab. In trees, *totara* timber (*Podocarpus totara*, A. Cunn.), forests, Norsewood, County of Waipawa; 1885.

Obs. This is a very remarkable species, from the comparative shortness of its body and great length of its stout posterior pair of legs, which are nearly four times the length of its body and head! being considerably longer than those of the two very large species—*H.*

gigantea, Col.,¹¹⁹ and *Deinacrida heteracantha*, White.¹²⁰ Unfortunately, my only specimen is imperfect, wanting the upper part of the head, antennæ, maxillæ, and prosternum; it got crushed in capturing by the workmen at the sawmill, and I only obtained the major part of the insect (that had been preserved for me) a few days after. Luckily, however, the legs and body were perfect, and so was a portion of the head, containing the clypeus, labrum, and maxillary and labial palpi. It must certainly be a rare species, as none of the workmen at the mill, nor of the villagers, (who subsequently saw it), long-used as they have been to forest work, had seen one like it before, although they very well knew the commoner and smaller kinds: it was also quite unique to me.

I may here repeat what I remarked before, in describing another rare and allied species, *Deinacrida armiger*, Col., that this insect appears to possess characters belonging to those two closely allied genera (*Deinacrida* and *Hemideina*), and that I doubt those two genera being naturally distinct.¹²¹

119 WC: "Trans. N.Z. Inst.," vol. xiv., p. 278.

120 WC: Zool. "Ereb." and "Terror," Ins., p. 24; Hutton's Cat. N.Z. Orthopt., &c., p. 79.

121 WC: "Trans. N.Z. Inst.," vol. xvii., p. 156.

**1886 Further notes and observations on the
gestation, birth and young of a lizard, a
species of *Naultinus*. *Transactions of the New
Zealand Institute* 19: 147-150.**

[*Read before the Hawke's Bay Philosophical Institute,
9th August, 1886.*]

IN a former paper, read here before you in the session of 1879, I gave some "Notes and observations on the animal economy and habits of one of our New Zealand Lizards, supposed to be a new species of *Naultinus*;"¹²² that paper also contained an [148] account of some young lizards (4), that were brought forth in my house, two of which I succeeded in rearing. At that time, however, I knew nothing of the manner of their being brought forth or expelled by their parent (as I have pretty fully related in that paper); and now, having very recently gleaned a few more particulars respecting the same, which may prove both interesting and curious, and perhaps unique, I propose to bring the same before you in this paper.

Early in this year, 1886, I received from Mr. J. Stewart, of Takapau (a member of this Society), a fine specimen of our green lizard, in good condition and very lively. I suspected at the time it was a female, and probably pregnant. Mr. Stewart informed me that it had been very recently captured—viz., on the 29th December, 1885. It was some time, however, before I could get it to eat, although I supplied it with flies, much as I did my former ones. In time it ate them, but sparingly; and although I

122 WC: "*Trans. N.Z. Inst.*," vol. xii., p. 251, etc.

often watched it, I never once detected it doing so, or seeking to capture them! in this respect so very different to those I formerly had. Yet it ate them, that was certain, without leaving a wing or a leg, for they were not to be found in its house (or glass case), out of which they could not possibly get; and the faeces of the reptile further proved it. It also differed widely from my former ones in not drinking; for, although I often tried to induce it to drink, it never once took any water, while the others were frequently lapping water, and licking wet spots on leaves, etc.; and I did not keep any water with this lizard in its house. It would, however, swim very well and strongly when I put it into a large basin of water. As the weather became colder in this present autumn—in May—it ceased taking any flies, and I had supposed it was about to hibernate, as the others did; so I set it aside, but kept looking at it occasionally. The last time that I did so, on the 8th of June, it seemed much as usual, only thinner from its long fasting, and not torpid, but rather lively. I therefore gave it a couple of flies, which, however, it would not eat. On my looking at it again on the following day, the 9th of June, I found that it had given birth to two young ones—curious-looking little things and fully formed, but both dead. The following is a description of them:—

They were both nearly alike, in size, shape, appearance, colour and weight; each one distinct, lying separate in the case, and closely enwrapped in its own proper semi-transparent chorion or secundine, which was entire around one, and slightly broken about the snout of the other below its eyes, so that the front part of its little head appeared. Each was closely doubled up—one with its tail

coiled tightly around its snout, and the other with its tail bent round and downwards beneath its chin; their shape was broadly oblong, one end much rounded, and [149] the other (containing the head) more produced; measuring, the one 8, and the other 9 lines in length, and 5 lines in width, compressed, with the surfaces smooth and flattened, but somewhat uneven owing to the prominences of the limbs, etc., and bearing a general resemblance to the smaller seed of the common garden bean (*Faba vulgaris*). Each fetus weighed 15 grains, their colour darkish-green on the back, shaded off in spots to lighter green and almost to white in some of the little knobs and slight hollows; the eyes bright and yellow, with dark pupils, as in the adult. The chorion, or enveloping membrane, was excessively thin and white, and filled with minute capillary branching flexuous veins of a bright florid red colour, a few of the main ones being tolerably large, presenting a pleasing appearance. The fetus that had its enwrappment broken at its snout, had its mouth slightly open, showing the little notch in the tip of its tongue. From their very fresh, damp, and glistening appearance, they appeared to have been very recently expelled.

From these circumstances here related, three facts in the history of these little animals seem to be established:—1. That their young are brought forth alive, and not within an egg (as is the case with many of the Saurians); this I had formerly supposed (*loc. cit.*, p. 264); 2. That their time of gestation must be at least 5½ months; 3. That they bring forth two at a birth—this, also, I had before observed (*l.c.*, pp. 251 and 264).

A brief description of this adult lizard may also be here given, seeing it varies a little from the species described. Extreme length $6\frac{1}{2}$ inches, of which the tail is $3\frac{1}{2}$ inches; colour a uniform bright green above, (which is particularly vivid on casting its old skin or epidermis), inclining to darkish-green as it grows older, and much paler beneath; head rather small, slightly concave between the eyes, and scales flattish; tongue darkish plum-coloured; two large blunt semi-transverse scales on the side of the base of the tail near the vent, and three similar ones on the opposite side; a patch of pre-anal pores singly on larger scales in 4–5 short rows; toes slender, long; tail cylindrical, very slender, much elongated, its scales not imbricated.

In some of its characters this lizard resembles *N. grayii*, Bell,¹²³ especially in the shape of its head with flattened scales, the few large convex scales near the base of the tail, (which, however, in that species are said to be "four on each side,") elongated toes, and uniform green colour. It has, also, a few characters in common with the species described by me—*N. pentagonalis* (*loc. cit.*)—as in its pre-anal scales with pores, elongated toes, and the colour of its tongue; still it seems different in other characters, and has certainly shown widely [150] different habits. It agrees still less with the other described species of green *Naultini*. It may be a variety of *N. grayii*, Bell, but certainly not of *N. punctatus*, Gray, which species

123 WC: "Trans. N.Z. Inst.", vol. iii., pp. 7 and 8.

Professor Hutton has subsequently stated to be identical with *N. grayii*.¹²⁴

ADDENDUM.—Since writing the above, and very recently, I have received a letter from Mr. D.P. Balfour, of Glenross, a member of this Society, dated 16th July, 1886, informing me of a green lizard, a species of *Naultinus*, and believed by him to be of the same species as *N. pentagonalis*, Col., which he had in confinement, having produced two young ones on the 14th of July. One of them was born alive, and the other dead, and then only after some considerable difficulty, Mr. Balfour largely assisting the mother; for when he saw her on this occasion, this second young one was half expelled, tail foremost, the other having been first born. Mr. Balfour also says that the living one measured 3 inches at its birth.

This is the *third* known instance of the birth of these green lizards, and all of them happened about mid-winter,¹²⁵ (a strange season!) when they should be in their natural semi-torpid hibernating state. This additional circumstance, now confirmed, seems very peculiar, and is worthy of being noted. The living young lizard, mentioned by Mr Balfour, seems to be of an extraordinary large size, "3 inches long when born;" those four born here with me, in 1878, were only a little over 1 inch in length when first seen, (*loc. cit.*, p. 263), and those described in this paper (although still uncoiled

124 WC: "Trans. N.Z. Inst.," vol. iv., p. 171.

125 WC: See "Trans. N.Z. Inst.," vol. xii., p. 251, for the first.

in their fetal membranes), cannot be much more.

**1886 A few Observations on the Tree-Ferns of
New Zealand; with particular Reference to
their peculiar Epiphytes, their Habit, and their
manner of Growth.**

Transactions of the New Zealand Institute 19: 252-
259.

[Read before the Hawke's Bay Philosophical Institute,
9th August, 1886.]

I.—GENERAL, OR COMMON.

NOT being acquainted with the living botany of the South Island, my remarks will be necessarily confined to the tree-ferns of the North Island: at the same time I think that many of those plants are nearly as common there as they are here.

Tree-ferns are general throughout the North Island, in forests, on the edges of woods, and on the banks of streams; they are found in dry hilly woods as well as in the low wet ones, but are more numerous and gregarious in the latter. Mostly growing singly, scattered among the trees of the forest; not unfrequently, however, in small clumps, especially on low alluvial flats or tongues of land in the woods bounded on two sides by watercourses; and, more rarely, in tolerably large and continuous groves in wet situations between hills, in forests.

The number of species at present known of tree-ferns is 11.¹²⁶ These are classed under 4 genera, viz., *Cyathea*, *Hemitelia*, *Dicksonia*, and *Alsophila*. Of those 4 genera, *Cyathea* has 5, and *Dicksonia* 4, species; *Hemitelia* possesses 2, and *Alsophila* [253] but 1. This last fern is much more rare, and affects a higher altitude than the others, having been only met with by me in the *Fagus* forests of the Ruahine mountain range, 2,000 feet altitude and upwards. Of all the genera, *Dicksonia* is the most common, especially in the southern parts of this island. Most of the species are endemic; one or two of them are stated to inhabit Tasmania and Australia; and the most striking and distinct one of all, *Cyathea dealbata* (the "Silver-tree-fern"), is said to be found in Lord Howe Islands, in latitude 32° S., between the North Cape of New Zealand and Sydney.

They are usually of a single stem, erect and columnar, and devoid of branches, with a spreading crown of large regular and elegant palm-like fronds, gracefully radiating from the top and forming a living circle. In some species, especially of *Cyathea*, (e.g., *C. medullaris*, Forst., and *C. polyneuron*, Col.), their fronds attain to a very large size; I have measured them 15–20 feet long and proportionately broad; when large they are gracefully arched; when small are often extended, and nearly plane. Sometimes, however, their stems are inclined, others are gradually curved, and others drooping—particularly when springing from the sides of a declivity or ravine, or

126 WC: Of these, 7 are described in the "Handbook, Flora of New Zealand," and "Synopsis Filicum;" and 4 (since discovered) in "Trans. N.Z. Inst.," vols. xi., xv., and xviii.

when over-hanging a stream. They are of various heights and thicknesses, some species being taller and slenderer than others, ranging in height from 6 to 45 feet, and in thickness from 4 inches to 2 feet: only one species, however, (*Dicksonia fibrosa*, Col.), attains to the maximum thickness, while *Dicksonia squarrosa*, *D. gracilis*, and most of the species of *Cyathea* and of *Hemitelia* are among the tallest. Our single known species of *Alsophila* is the shortest, and is sometimes stemless.

They are very rarely met with bearing branches; I have, however, seen a few 2-branched, and two specimens 3-branched; and occasionally 2, 3, or 4 springing closely together from the ground, as if fascicled below at the base.

Sometimes their trunks are quite clean, and devoid of epiphytal vegetation; more commonly, however, they are clothed with a dense mass of epiphytes; the stems of some species, when clear, often present a neat appearance throughout, from the regularity of the broken bases of their stipites, which add much to their beauty; while others show no such remains, but, instead, a dense and everincreasing mass of hardened surface rootlets, which generally assume a pretty even appearance, growing circularly around the stem after the manner of bark, but now and then shooting downwards irregularly in long shaggy masses; this last feature, however, generally pertains to the lower side of curved stems. And while on some trunks there are few or no withered fronds hanging from above beneath the living crown of the fern-tree, others are completely enveloped in their old

pendulous fronds, [254] the growth of many years, presenting a curious bushy spectacle, appearing in the quiet sheltered recesses of the ancient forests as if no disturbance had ever there taken place, for not one old frond had fallen from above! As a natural consequence, in such cases the stems underneath are clean and free from epiphytes.

The epiphytal vegetation common to the stems of the tree-ferns is in some respects peculiar and worthy of notice. For, while such is mainly composed of some of our smallest and most delicate ferns, (of *Hepaticæ*, and one or two species of mosses, and not unfrequently a small *Astelia*), some of the larger trees of the forest are often seen springing from their stems; these not unfrequently flourish in their peculiar situations, and sometimes grow to a large size, lofty, overtopping the fern-tree itself, and sometimes, though rarely, killing it by its close embrace; more usually, both seem to flourish and enjoy their curious reciprocal attachment. The trees that are commonly found so combined with the fern-tree are *Weinmannia* (sps.), and *Panax arborea*, and *Ackama rosæfolia* in the forests at the North, the peculiar locality of this genus.

The ferns that often clothe and completely hide the trunks of the tree-ferns comprise the smaller species of *Hymenophyllum*, as *H. nitens*, *H. tunbridgense* (and its varieties), and *H. rarum*; also, *Trichomanes venosum*, and its near ally *T. venustula*; indeed, such may truly be called the proper home of these two *Trichomanes*, as well as of *Hymenophyllum tunbridgense*, for nowhere else are these pretty little ferns to be found growing so

luxuriantly. It is a beautiful object to contemplate the whole stem of a large tree-fern so dressed and decorated by Nature! often extending completely and closely around the trunk, and that for several feet; their little elegant glistening light-green fronds, so very regular, too, in their manner of pendulous growth, overlapping each other and imbricating like scales. Here is also the home of that highly curious fern *Tmesipteris*, never found growing on the earth, and rarely found on any other plant; and very recently a small and new species¹²⁷ of the closely-allied genus *Lycopodium* has been detected growing thereon; while a small elegant moss, *Hymenodon piliferus*, (the only New Zealand species of that genus), is sure to be found deeply ensconced between the numerous dead stipites, and growing freely in its dry abode. Two or three species of delicate small frondose *Hepaticæ* (e.g., *Symphyogyna sub-simplex*, *S. brevicaulis*, *S. simplex*, *Podomitrium*, *Phyllanthus*, etc.), are also at home there, snugly nestling deep in the crevices of the stems, from which it is a difficult matter to dislodge them without breaking; while some of the larger *Hepaticæ*, as the dendroid *Plagiochilæ*, are often found growing [255] luxuriantly upon their trunks, completely enwrapping them below, especially in low, wet, shaded woods.

Other and larger ferns than those mentioned are not unfrequently to be met with, depending from the trunks of the tree-ferns, as *Hymenophyllum dilatatum*, *H. demissum*, *H. multifidum*, *Asplenium falcatum*, *A.*

127 WC: A full description of this little novelty has been prepared, and will be given in a following paper.

flaccidum, and *Polypodium* (species); also *Lycopodium varium*; but then these are much more common and plentiful elsewhere, both on trees and on the ground.

II.—PARTICULAR, OR UNCOMMON.

Under this heading I wish to state what I have more recently seen, which, indeed, is the main cause of my writing this paper. During the last three to four years I have noticed some extraordinary things pertaining to the tree-ferns.

1. *As to their great number in one spot, and their manner of growth there.*—In certain unfrequented localities in the dense forest of the Seventy-mile Bush, which I explored at different times, I suddenly came upon two or three groves of tree-ferns: one in particular I will attempt to describe. On a flat in the heart of the forest, in a deep hollow lying between steep hills, the bottom of which for want of drainage was very wet and uneven, and contained much deep vegetable mud and water even in the driest summer season, I found a large and continuous grove or thicket of very tall tree-ferns, chiefly *Dicksonia squarrosa*, and *D. fibrosa*, with a few of *Cyathea dealbata* intermixed, with but few forest trees and shrubs growing scattered among them. I suppose they occupied about 3 roods of ground, and I estimated their number to be from 800 to 1,000. They were all lofty, from 25 to 35 feet high, and in many places growing so close together that it was impossible to force one's way through them. Their trunks were most profusely covered with the usual epiphytal ferns (those smaller ones already mentioned). Conspicuous, however, among them, was that very rare

fern in these parts, *Hymenophyllum subtilissimum*, Kunze, (*H. frankliniarum*, Col.,¹²⁸) which literally clothed their trunks from top to base, intermixing below in the more humid spots with a fine dendroid *Plagiochila* (sp. nov.) of most luxuriant growth.¹²⁹ The ground, too, with rotting logs and stumps below, was densely covered with various fine *Hepaticæ* of several genera, (as *Plagiochila*, *Gottschea*, *Lepidozia*, *Mastigobryum*, *Podomitrium*, *Symphyogyna*, etc.), while here and there among them were several lovely and rare mosses of the genera *Hypopterygium*, *Cyatrophorum*, and *Hookeria*; and on the higher and drier stumps and mounds grew graceful undisturbed cushions of *Leucobryum candidum*, plentifully in fruit, rather a rare occurrence. [256] A few of those tree-ferns were 2-branched; one, I noticed bearing three branches; all of the branches were at some height from the ground, and rose just as high as the parent stock. Several of those tree-ferns grew in little clumps of 3, 4, or 5, arising from small mounds 2 feet high or so, with deep watery muddy holes between them; their stems were very close together, and appeared as if fascicled or springing from one root-stock below; while above they not unfrequently diverged from the perpendicular.

Familiar as I have long been with our New Zealand forests and their denizens, I gazed with astonishment in this deep and secluded grove of tree-ferns! for I had

128 WC: *Hymenophyllum aeruginosum*, Carm., of "Handbook N.Z. Flora."

129 WC: The description of this fine species will be given in a following paper.

never before witnessed such a grand display of them; neither had I seen for upwards of 40 years¹³⁰ this pretty species of soft silky *Hymenophyllum* that was here so exceedingly common. Very certain I am that it does not grow in those several and many scattered parts of that same extensive forest which I have so frequently visited during these last 10–12 years.

From this wet wood I brought away several fine *Hepaticæ*; particularly that superb *Gottschea*, *G. dichotoma*, Col.,¹³¹ the largest known New Zealand species. This fine plant (which I have only detected in this locality), completely and thickly covered a large old stump, hanging gracefully down around its top, reminding one of a rich-looking fringed circular cushion or hassock. The ground or mud in many places was thickly covered with long irregular patches of an erect species of *Symphyogyna*, which I believe to be new.¹³² This genus is mostly gregarious in small lots, but I never before saw it growing in such profusion, and so very compact and large, somewhat resembling beds of curled cress or parsley. Places and spots of botanical beauty or novelty, however, (like all other things), have their drawbacks or opposites: the worst feature here was the very bad footing, causing much tumbling about and

130 WC: Originally discovered in the mountainous woods of the interior, N.W. of Lake Waikare, in 1841, and published in 1842 in the "Tasmanian Journal of Natural Science," vol. i., p. 378; also vol. ii., p. 183.

131 WC: See "Trans. N.Z. Inst.," vol. xviii., p. 284.

132 WC: Since ascertained to be such: a description of this plant will also be given in a paper to follow.

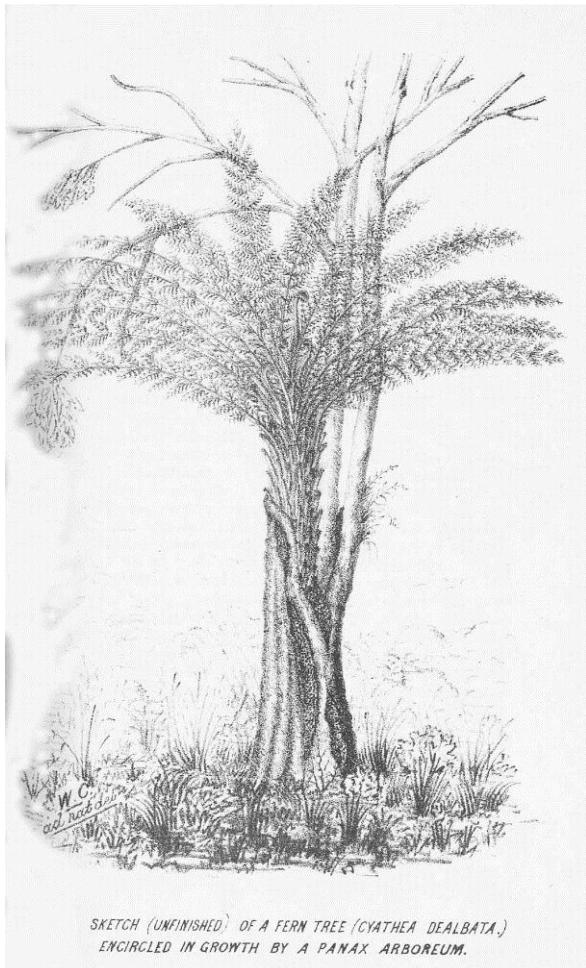
splashing and sinking, between slippery and hidden rotting roots and branches, into deep black vegetable mud up to one's knees; and then there was the haunting fear of some accident happening, through which I should not be able to get out of this tangled labyrinth; and, as a matter of course, in that distant and unfrequented spot, should not be easily or early found, if ever found at all!

2. *As to the very peculiar growth of some tree-ferns, caused by [257] their own epiphytes.*—Some novel instances of this nature I have occasionally met with, a few of them being very strange. ¹³³

(1.) I have already said tree-ferns are often found with young plants of *Weinmannia* (sps.), and of *Panax arborea*, springing from their stocks at some distance above the ground. These trees also grow to a considerable size—of 3, 5 and 7 feet, and are well-branched and flourishing, although their roots do not reach down to the earth. A few of them, however, of a much larger size, 14–16 feet high, that I have seen and examined, send down their trunks (I can hardly term them roots) from the place where they had sprung from seed on the stock of the fern-tree into the ground, (sometimes in two or three branches or ramifications),

133 Colenso wrote to Balfour (27 September 1887) about this illustration, "The plate of the Cyathea & Panax is poorly done—the lower trunk of the Panax—right-hand side of picture up to head of the higher big branch—is black and muddy—it should be whitish & smooth, to show the Panax bark there, it is so in the photo.—and is so in the drawing at Home in the "Gardener's Chronicle", where, I see, they have also produced it with its account." [*Gardeners' Chronicle* Vol. 1, 3rd series, 28 May 1887, p.713].

closely adhering to the fern-tree and partly intertwining its stem.



(2.) In a dry wood on the bank of the River Mangatawhainui I saw several specimens of this nature. One aged fern-tree had its base completely surrounded at the surface of the ground by a large *Weinmannia racemosa*, that had originally sprung from its stock, which also adhered to it above on one side for several feet. Another fern-tree had a *Weinmannia* embracing it on the one side, and on the opposite side a *Panax arborea*, (this latter very largely and closely), and both trees had originally sprung from the trunk of the fern-tree, and thence descended to the earth. I noticed one tree-fern in particular, that was wholly separated below from the earth, having its caudex closely hugged for 2–3 feet by a large branching *Panax arborea*, whose branches or divided stem (I cannot call them roots) descended from the original point of first growth above in the stock of the fern-tree, and enwrapping it at intervals had held it fast, wholly immovable, as if the two trees had coalesced into one. This was on the side of a dry hill, and the rains, etc., in past years, had completely washed away the soil and small vegetation from beneath and around the base of the fern-tree; the fern, however (a *Cyathea dealbata*), was of a large size and most luxuriant growth. I had detected two or three instances of that nature before, but those fern-trees were only partially severed from the earth at their bases, while this one was wholly separate, and from its appearance had been so for many years, as no fresh rootlets were emitted there.

(3.) Strange, however, as that instance may appear, I have still a more curious anomaly to mention, which, as far as I know, is quite unique. Four years ago, while botanising in the high and dry woods near Matamau, I came upon a

fine tree-fern (*Cyathea dealbata*), whose caudex below was almost wholly surrounded by its former epiphytal foster-child—a stout spreading specimen of *Panax arborea*, from which, or out of which! the fern-tree luxuriously grew, as if it were springing from a large vase! On the one side (or, rather, speaking correctly, on three [258] sides), the fern-tree was wholly enclosed; and this was all the more plainly to be seen, from the fact of the trunk of the *Panax* being bare of epiphytal vegetation, so that its light-coloured and clean bark showed in strong relief against that of the darker fern-tree in the few narrow interstices on the one side where it still slightly appeared. Another great curiosity was the entire unbroken appearance of the *Panax* on the one side of the fern-tree, which was completely covered by it; there was no trace discernible of any cicatrices or joinings in its bark, which was even. The tree, or pair so strangely conjoined, stood in a small glade or open space among the trees of the forest that were densely thick around, which circumstance, together with the dark-green foliage of the very large leaves and sprays of the *Panax*, above and around the delicate pure white fronds of the fern (viewed from beneath them and looking up), with the blue sky here and there in the background seen through their branches, caused the two trees to be seen to a great advantage. The *tout ensemble* was both unusual and charming, and served to bring to mind portions of Ovid's metamorphoses of trees.

Another pleasing thought arose from the consideration of this tree (*Panax*), in its so clasping and sending out and down its root-like branches, (which it never does when growing in the earth in its native woods), thus showing

its real natural affinity in latent habit to those other genera of that same natural order in which it is placed, (*e.g.*, *Hedera*, *Gunnera*, etc.), which so largely and constantly grow and adhere by their climbing root-lets; and yet the ivy (*Hedera helix*) sometimes grows as a standard.

I visited that spot on several occasions during two years, and always with feelings of admiration; and was so much surprised and pleased with my “find,” that on two of those visits, having taken my portfolio with me, I attempted to take a drawing of it; (in one of those times, however, being caught in heavy rain!) but, owing to the loss of drawing and writing power in my thumb, I made a poor job of it. Still, such as it is, and unfinished, I bring it before you, as by it you may be the better able to know somewhat of the relative sizes and appearances of the two curiously-entwined and coalesced plants.

I took accurate measurements of this botanical phenomenon, and the following is the result:—

1. Height of caudex of *Cyathea* from the ground to the springing of its living fronds, 7 ft. 6 in.
2. Height of *Panax*, about 18 ft.
3. Girth of both, taken together at base, 6 ft.
4. At 5 ft. 3 in. from the ground the *Panax* tree forked into two stout, erect main branches.
5. Girth of both plants under the forking of the *Panax*, 5 ft. 3 in. [259]
6. Girth of main branch of *Panax*, 2 ft. 10 in.; of the other, 2 ft. 3 in.
7. Girth of *Cyathea*, immediately under its crown of fronds, 5 ft.

8. Breadth of the narrow interstices of the stem of the fern-tree not yet covered by the *Panax*: at the base, 2 in.; above, in the widest part, 3 in.
 9. The fronds of the fern extended about 9 ft. each way, forming a flattish arch.
 10. The lower horizontal branches of the *Panax* extended nearly equal with the fronds of the fern.
 11. The trunk of the *Panax* below was quite bare of epiphytal vegetation (only a small young creeping plant of *Metrosideros scandens* just climbing up at one corner), but large fronds of *Polypodium billardieri* and other ferns hung pendulous from between the two upright limbs of the *Panax* and the *Cyathea*.
 12. The longitudinal edges of the root-like descending lower limbs of the *Panax* showed exactly the appearance of the back of a healthy tree from which a limb has been clean cut off, growing-in with thick round advancing margins over the wound.
-

**1886 A Description of some newly-discovered
and rare indigenous Phænogamic Plants,
being a further Contribution towards making
known the Botany of New Zealand.
Transactions of the New Zealand Institute 19: 259-
271.**

[Read before the Hawke's Bay Philosophical Institute,
11th October, 1886.]

Class I.—DICOTYLEDONS.

ORDER I.¹³⁴—RANUNCULACEÆ.

Genus 1. Clematis, Linn.

1. *C. aphylla*,¹³⁵ sp. nov.

A slender prostrate trailing plant. Stems 2–4 feet (or more) long, cylindrical, very narrow, 1 line diameter, green, glabrous, striate, few-branched; nodes at pretty regular distances, 5–6 inches apart. Leaves, 0. Peduncles slender, hairy, [260] 1½–2 inches long, a 2-lobed connate densely hairy bract at base, and another about the middle; hairs brown. Flowers hermaphrodite, axillary, opposite, single, small, greenish with a brown tinge, about 1 inch diameter, (?) monœcious; sepals 4, broadly-lanceolate, or sub-ovate lanceolate, sub-acute, 6 lines long, conniving, very silky on both surfaces, many nerved (6–7), nerves branching; margins uneven at tips, sub-ciliate. Stamens

134 WC: The numbers in this paper attached to both orders and genera are those of "The Handbook of the New Zealand Flora."

135 Possibly *Clematis afoliata* Buchanan.

10, sub-lanceolate-linear, rather broad, green; anthers long, linear, very narrow, with a minute blunt connective; achenes (immature) slightly silky; styles shorter than sepals, green, silky, tips recurved.

Hab. Trailing and hanging down on cliffy spots, Puketapu, near Napier; 1885–6: *Mr. H. Hill.*

Obs. This is a very peculiar plant, widely differing from the other New Zealand species of this genus, as well as from those of Australia and Tasmania. We have now known it for two years, and it always presents the same appearance—long trailing slender green stems, no leaves, and single 4-sepaled hermaphrodite flowers. I have examined several specimens, and they do not vary; only one of them had three flowers, all on separate peduncles and with separate basal bracts springing from one axil, as if fascicled but distinct. It would have been described by me last year, but I had a suspicion that it might prove to be identical with *C. foetida*, var. β *depauperata*, or a variety of it; which, however, I do not now believe, after re-examining several fresh specimens.

ORDER IV.—VIOLARIEÆ.

Genus 2. *Melicytus*, Forst.

1. *M. microphyllus*,¹³⁶ sp. nov.

A tall, slender shrub or small tree, 12–15 feet high, trunk 5 inches diameter; bark pale drab-brown, much and

136 *Melicytus micranthus* Hook.f. var. *microphyllus* (Colenso)
Cheeseman.

densely mossed, etc.; branches long, slender; branchlets many, sub-erect, pubescent. Leaves small, numerous, sub-coriaceous, glabrous, scattered, single and sub-fascicled 2–4 together, 1–3 (rarely 4) lines long, oblong-orbicular, sub-panduriform, and orbicular, reticulately and coarsely veined, green, margin purple, sinuate, acutely toothed with a small red curved tooth at extremity of each primary vein (usually 6 on a leaf); apex very broad, obtuse, and retuse, with a small central tooth; base tapering; petiole short, under 1 line long, slightly puberulous, with small scarious stipellæ at base. Flowers pretty numerous, rather small, orbicular, 1½–2 lines diameter, axillary and lateral, solitary, sometimes in pairs; peduncle longer than petiole, 1–1½ lines long, stout, slightly puberulous, bracteate; bracts generally above, rarely below. Calyx purple, glabrous, veined, [261] acutely 5-lobed, lobes spreading, tips sub-laciniate. Petals (sometimes 6) sessile, rather large, spreading, broadly ovate and sub-orbicular, with a single middle vein, pale, streaked and tipped with purple; tips slightly erose or sub-laciniate, sub-apiculate and recurved. Anthers (sometimes 6) sessile, large, gibbous, didymous, with a large thickish clavate connective a little higher than the anther. Stigma very small, sessile, conical, slightly sub-trifid. Fruit 0.

Hab. Forests, banks of River Mangatawhainui, near Norse-wood, County of Waipawa; 1886: *W.C.*

Obs. This species certainly approaches very near to *M. micranthus*, Hook. fil., but it differs in several characters, as well as in its much larger size, with larger flowers and smaller leaves. I suspect this plant is dioecious, and the

above description of the *male* flowers only. I first detected it in full flower in March; and on again visiting the same tree in May (end of month), hoping to obtain fruit, there was not a berry to be found, but the plant still bearing a few flowers. I have for many years noticed young plants of upright growth, and 5–7 feet high, in those woods, but always in leaf only, although frequently diligently examined by me. This tree is the only one I found bearing flowers.

ORDER VI.—CARYOPHYLLEÆ.

Genus 3. *Colobanthus*, Bartling.

1. *C. repens*,¹³⁷ sp. nov.

A small quite glabrous low creeping perennial plant, about $\frac{3}{4}$ -inch high, forming a short densely matted turf; branches 3–4 inches long, procumbent, rooting at nodes. Leaves about $\frac{1}{2}$ inch long, narrow-linear, subulate, subacute with acicular tips, thickish, not rigid, nerveless, green, shining, spreading, recurved; the lower dilated and largely membranous at base, the upper connate; minutely ciliate on lower margins; ciliæ fugacious. Scapes solitary, axillary, slender, erect, straight, 6–7 lines long, longer than leaves. Perianth 1 line long; sepals 4, broadly ovate, obtuse, shorter than capsule, green, concave, 3-nerved, slightly margined; margins translucent. Stigmas 4, strongly recurved, stout, papillose, brown. Capsule pale, longer than perianth, valves obtuse, tips rounded. Seeds light-brown, sub-triangular-orbicular, finely granulate.

137 Allan thought this was an introduced weed.

Hab. On low alluvial banks, (growing intermixed with *Pratia* and *Hydrocotyle*), sides of River Mangatawhainui, near Norsewood, County of Waipawa; 1886: *W.C.*

Obs. A species possessing affinity with *C. quitensis* and *C. billardieri* (both New Zealand plants), but differing in several particulars. [262]

ORDER XXXIII.—UMBELLIFERÆ.

Genus 1. *Hydrocotyle*, Linn.

1. *H. involucrata*,¹³⁸ sp. nov.

Plant procumbent, trailing. Stems 10–00 inches long, slender, glabrous, with a few weak scattered hairs; nodes 3–5 inches apart, each having a large clasping sub-orbicular-reniform stipule, the margins irregularly and minutely lobed and toothed, pellucid and highly cellular; cells large oblong. Leaves few, distant, membranous, somewhat roughish from raised bases of hairs, dull light-green, reniform, 1–1½ inches broad, 6-lobed; lobes rounded, cut into one-fifth of leaf, their sinuses overlapping; margins irregular, sub-crenate-toothed; basal sinus very broad, the margins more acutely toothed; 8-veined, veins (and margins) light-reddish; hairy on both sides, but much more so below; hairs short, thickish, acute, white; petioles very long 3–5 inches, slender, weak, hairy below with long scattered weak 1-nerved reflexed hairs that increase in density upwards towards the apex. Peduncle one-third length of leaves, 1–1½

138 *Hydrocotyle novae-zeelandiae* DC. var. *involucrata* (Col.) Allan.

inches long, hairy. Umbels 8–14-flowered, in a compact sub-globular head. Involucre in 2 rows, composed of 10–12 convex incurved membranous leaflets with darkish-brown centres and pellucid margins; the outer, ovate, margins laciniate; the inner, linear-oblong, margins entire. Flowers rather large, pale-brown, pedicelled; pedicels erect, glabrous, 1 line long, with sometimes a small bracteole near the apex; petals valvate, broadly ovate, 1-nerved; tips sub-acute and obtuse, their margins finely crenulate-toothed (*sub lente*); stamens largely exserted, curved; anthers orbicular (a little broader than long), pale; styles stout, long, at first converging, afterwards very divergent. Fruit rather large, pale-greenish-brown, nearly orbicular, $\frac{1}{10}$ inch broad, straight below, apex very slightly notched, flat, glabrous, shining, thickest at centre, intermediate ribs obscure, dorsal edge of carpels obtuse; seed narrow, linear-ovate, obtuse.

Hab. Low wet spots in forests, hilly country north of Napier, County of Wairoa; 1886: *Mr. A. Hamilton.*

Obs. A species having some affinity with *H. novæ-zealandiae*, D.C., *H. pterocarpa*, F. Müell., and *H. vagans*, Hook. fil., (an Australian species), but differing from them (and from all the species described in the "Handbook, Flora N.Z.",) by its involucral leaflets; in this respect, however, it approaches a few of the Australian species; also, the two newly-described species (mihi), *H. colorata* and *H. alsophila*,¹³⁹ in their floral bracteoles. [263]

139 WC: "Trans. N.Z. Inst." vol. xviii., pp. 260–261.

ORDER XXXVIII.—RUBIACEÆ.

Genus 1. *Coprosma*, Forst.1. *C. autumnalis*,¹⁴⁰ sp. nov.

Plant, a small tree, or tall slender shrub, erect, 12–16 feet high, few-branched; trunk 3–5 inches diameter, clear of branches; branches distant, slender, long, drooping; bark thin, light-brown, with a fine scaly silvery-white epidermis; inner bark orange. Leaves large, membranous, not numerous, sub-terminal on branchlets, 1–1¼ inches apart, broadly lanceolate, 5–6½ inches long, 2½–3½ inches broad, acute, narrowly margined; margins sub-crenulate, especially towards tips; dark-green and shining above, much paler below, coarsely reticulated on both sides, deeply and largely foveolate in main axils; foveolæ ciliate; petioles stout, 1–1¼ inches; stipules large, sub-conical, cuspidate, hard, black, glossy. Peduncles axillary; (*fem.*) stout, sub-compressed, 1–1½ inches long, trichotomously branched; the 3 sub-peduncles fascicled, each ½ inch long; stipules at base 4-fid. Flowers—*Male*: Peduncles ½–¾ inch long, rather slender, 3- sometimes 5-branched, with a pair of small leafy bracts at base; sub-peduncles 4–5 lines long; heads of flowers large, densely compact, outer heads each 6–9, middle head 8–16 flowers; calyx small, cup-shaped, with 5–6 stoutish teeth; corolla campanulate, 3 lines long, 5-lobed; lobes rather large, one-third length of corolla, sub-acute, erect; anthers 6 (sometimes in outer flowers 5), large, stout, 2 lines long, linear, obtuse, purple-tipped, base much hastate, very pendulous; stamens ½ inch long, filiform,

140 *Coprosma grandifolia* Hook.f.

minutely papillose. *Female*: outer 2 sub-peduncles, each 3–4, and the central one 6–9 flowers; involucral or floral bract large, with 6–8 coarse teeth; calyx greenish, purple spotted, sub-urceolate, with 5–6 stout teeth; teeth conniving; corolla pale green, infundibuliform, 2½ lines long, 5-sometimes 6-lobed; lobes large, obtuse, spreading, sub-recurved; stigmas 2, ½ inch long, stout, divergent, much crumpled, very pubescent. Fruit 3–4, sometimes 5–6 (rarely 9), drupæ, clustered, sessile, broadly elliptic, 4–4½ lines long, bright red (red-currant-colour), very glossy. Seeds large, oval, sub-acute, 3½ lines long, 2 lines broad, convex on the outside, flat within, white, somewhat silvery.

Hab. Forests near Norsewood, County of Waipawa; 1881–6: *W.C.* Flowering in May and June.

Obs. I. The near affinity of this fine species is with *C. grandifolia*, Hook. fil., from which, however, it differs in several characters: as the larger number of its flowers in heads, both male and female, in its corollas, anthers, and large elliptic fruits. It is a curious and novel sight to see in the autumn the female plant loaded with both ripe fruit and the [264] new opening flowers of the coming spring-summer season; at such time, too, the ground is covered with the glossy red fruits, which are also juicy and sweet. The pleasing phenomenon served to remind me of the poet Thomson's ideal of vegetation in the beginning—the Golden Age of man,—

“Great Spring before
Green'd all the year; and fruits and blossoms blush'd
In social sweetness on the self-same bough.”

319.

—SEASONS: *Spring*, 1.

The male flowers likewise, at the same time, are really handsome, with their large heads of fringe-like anthers.

Obs. II. I have long known this plant *in fruit* only; this, however, was owing to its *autumnal* flowering (different to the other species of this genus), for which I was not prepared.

ORDER LIII.—SCROPHULARINEÆ.

Genus 4. *Gratiola*, Linn.

1. *G. concinna*,¹⁴¹ sp. nov.

Plant procumbent, creeping, matted, sub-ascending. Stems 7–10 inches long, stout, purple-spotted, simple or slightly branched, puberulous with long white flattish-jointed glandular hairs. Leaves distant, sub $\frac{1}{2}$ inch apart, orbicular and orbicular-elliptic, 2 lines long, membranaceous, of a pleasing green, glabrous, reticulately veined, with 4–5 small obtuse teeth each having a coloured spot at its base, petioled; petioles short, broad. Flowers rather few, axillary, solitary, peduncled; peduncles 1–2 lines long, stoutish, hairy. Calyx coloured, hairy, leafy, 5-parted to base; lobes long, unequal, 3-nerved, pellucid-dotted, toothed, recurved, tips obtuse; with two long similar bracts at base. Corolla 4 lines long, white, somewhat hairy; tube slightly curved, much veined; veins purple and branched above; limb spreading,

141 *Stet.*

4-lobed; upper lip large, sub-bilobed, thickly clothed with yellow glandular hairs; lower lip 3-fid, each lobe emarginate. Stigma sub-rhomboid, dilated, flattish. Capsule sub-orbicular, turgid, green, glabrous, shining. Seeds brown, conical, very obtuse, a little curved.

Hab. Edges of a swamp in forest, south bank of the River Mangatawhainui, near Norsewood, County of Waipawa, where it thickly covers the ground in large spreading patches, presenting a very pleasing and neat appearance; March, 1886: *W.C.*

I have not noticed it anywhere else.

Obs. This species is evidently allied to *G. nana*, Benth., but it is a much larger plant, and is very distinct in several of its characters.

Genus 10. *Euphrasia*, Linn.

1. *E. tricolor*,¹⁴² sp. nov.

Plant perennial, sub-shrubby, 8–12 inches high; erect, [265] compact, branched above. Stems and peduncles densely puberulous. Leaves numerous in opposite pairs, mostly small, under 3 lines long (a few scattered lower ones 8–9 lines long), sub-rhombicovate, or obovate, impressed underneath as if stamped (sunk) within margin and between veins, once or twice toothed, the smallest entire. Flowers rather numerous, showy, solitary, axillary in opposite pairs; peduncle 1 line long. Calyx 2½ lines long, glabrous, sub-campanulate, 4-lobed; lobes large, obtuse, coarsely and prominently veined. Corolla ringent, inflated, pilose without, 9 lines long; white, with straight

142 Perhaps *Euphrasia cuneata* G. Forst.

dark-pink veins (usually 8 above and 9 below), with a large orange spot at base of lower lip, and also of filaments; tube rather short; lower lobes large, spreading, sub-rectangular, with straight lateral margins; apices deeply emarginate and sinuous; upper lip recurved, lobes notched. Anthers glabrous, very obtuse, dark-umber; edges of valves largely ciliate with stiff white hairs; spurs of posterior pair equal, white, acute. Stigma sub-globose and (with style) finely pilose. Capsule oblong, $3\frac{1}{2}$ lines long, obtuse, sub-compressed at top, with base of style persistent, puberulous. Seeds white, membranaceous; testa very lax, winged above, produced below, striate with minute transverse bars.

Hab. Bases of high wooded cliffs forming the banks of the River Mangatawhainui, near Norsewood, County of Waipawa; 1886: W.C.

Obs. I. This plant is nearly allied to *E. cuneata*, Forst., but differs from that species in several particulars: as in its larger lobes to both calyx and corolla, the latter spreading, richly coloured, with straight lateral margins; in its glabrous and coloured and largely ciliated (almost crested) anthers, with equal spurs, etc. But, as both Hooker and Bentham have each separately remarked (the former on our New Zealand, and the latter on the Australian species), "the several species are very variable"; and this I have also often proved.

II. A small variety of this plant (a. *microphylla*) is found 20 miles further south, in the open plains between Tahoraiti and Woodville; it closely resembles this one, only it is very much smaller in all its parts, its numerous

leaves being only 1–1½ lines long; *E. tricolor*, var. *microphylla*, Col.

Class II.—MONOCOTYLEDONS.

ORDER VII.—LILIACEÆ.

Genus 5. Astelia, Banks and Solander.

1. *A. hastata*,¹⁴³ sp. nov.

Leaves very long, sub-coriaceous, linear-acuminate, 4 feet long, 1½ inches broad at middle, tip filiform; many nerved, with 2 very prominent and coloured narrow ones; upper surface [266] glabrous, thickly pubescent underneath, as if minutely and regularly pitted (very apparent under a lens), sharply keeled; base much dilated and clasping, 4½ inches broad, black, shining, margins thin; veins spreading laterally, largely and coarsely reticulate. *Male*: Scape 2 feet long, stout, triquetrous, 1¾ inches circumference at base, composed of 7 nearly equal equidistant long single drooping racemes, the lowest 9 inches long, ¾ inch wide, each about 3 inches apart on scape; peduncles 1 inch long, each with an excessively long bract at its base, ovate, very acuminate, caudate, drawn out into a very long narrow tip, the lowest being 2 feet 6 inches long and 3 inches wide at the broadest; the upper portion light-green, sub-coriaceous and glabrous, the lower white, soft, and densely silky on both sides; the pubescence adpressed in stippled dots. Flowers yellow-brown, numerous, crowded, spreading, above 1 inch diameter; segments cut to base, narrow, linear, obtuse, ½

143 *Collospermum hastatum* (Col.) Skottsb.

inch long, much longer than anthers, reflexed, with 1 central nerve running to tip and 2 lateral nerves ending half-way; all shaggy below on the outside (with pedicels and bracteoles), but the 3 inner have only a narrow central shaggy line to tip, with membranous glabrous margins, the 3 outer being hairy, with ciliated edges; pedicels 2 lines long, each with a small linear 1-nerved bracteole the length of pedicel. Stamens 3 lines long, spreading, rumpled; anthers, $\frac{1}{10}$; inch long, triangular, obtuse, emarginate, largely hastate, their basal extremities curved and divergent, corrugated, somewhat bladdery. Stigma rather large, slightly produced, 3-fid.

Female: Scape 15–18 inches long, very stout, composed of seven long narrow cylindrical simple flaccid racemes; much more compact on scape than male, each 9–10 inches long and $\frac{1}{2}$ inch wide; peduncles very short, 2–4 lines, but the lowest 1½ inches; bracts much as in male, very silky below, the lowest 2 feet 6 inches long, and 2 inches wide at base. Flowers light-brown, exceedingly numerous and compact, very small, scarcely 2 lines long including ovary; segments not split to base, very small, about $\frac{1}{2}$ line long, somewhat linear-ovate, reflexed from middle, the 3 outer more shaggy and ciliate, 1-nerved to tip; tips obtuse; the lower part of perianth forming a cup around the base of ovary; pedicels about 3 lines long, erect, close, but not crowded, sub-vorticillate, patent, very shaggy, each with a narrow-linear bracteole at base the length of the pedicel; hairs flat, membranous, glossy, sub-ovate-lanceolate, nerved, white. Ovary (immature) ovate, beak produced; stigma, large, spreading, very pubescent; anthers (abortive) minute, triangular, acute,

hastate, adhering closely to ovary, and with a part of the stamen appearing above the reflexed segment.

Hab. Forests, hilly country north of Napier, County of Wairoa; January, 1886: *Mr. A. Hamilton.* [267]

Obs. This very fine species is naturally allied to *A. solandri*, A. Cunn., and to *A. microspermum*, Col.,¹⁴⁴ but differing largely from them both in several important characters, particularly in size, length, and shape of subpanicles (racemes), in its extraordinarily long bracts, its different yellow-brown flowers, its very peculiar large corrugated and hastate anthers, and its curiously flattened broad and nerved hairs.

2. *A. graminifolia*,¹⁴⁵ sp. nov.

Plant slender, few (7–8) leaved; apparently of simple distinct habit of growth. Leaves sub-membranaceous, largely drooping, 15–21 inches long, $\frac{1}{4}$ inch wide, linear-acuminate, tips filiform; the upper surface glabrous, dull greyish-green; the lower pubescent-hoary; hairs small, greyish, very closely adpressed; many nerved, with small distant transverse veinlets between them, and 2 very prominent narrow equidistant reddish nerves on the upper surface; margins slightly recurved and ciliate with fine shaggy white hairs; the base spreading, gradually dilated, 1 inch wide, very membranous, with fine silvery shining hairs thick on both surfaces. Scape (*female*) 6–7 inches long including panicle, erect, densely shaggy with white shining hairs, as also pedicels and outsides of floral

144 WC: "Trans. N.Z. Inst.", vol. xvii., p. 251.

145 *Collospermum microspermum* (Colenso) Skottsb.

bracts and bracteoles; panicle loose, 2 inches long, composed of 2 distant erect racemes and 3 intermediate solitary flowers; flowers in racemes close-set, pedicelled; pedicels $\frac{1}{10}$ th inch, patent; the upper raceme of top about $\frac{1}{2}$ inch long, composed of 17 flowers; the lower raceme, distant about $1\frac{1}{2}$ inches from the upper one, about $\frac{3}{4}$ inch long, composed of 20 flowers, with peduncle $\frac{1}{2}$ inch, and a long leaf-like membranaceous and very acuminate bract, $6\frac{1}{2}$ inches long at base; each of the solitary flowers having a long bract at base of pedicel. Flowers: perianth rather large, reddish-brown, glabrous, somewhat scarious, forming a very loose globular cup around ovary; segments free, $\frac{2}{5}$ th of perianth, narrow, linear-ovate, acuminate, 1-nerved, the nerve extending to base of perianth; a long very narrow linear sub-erect reddish 1-nerved bracteole at base of each pedicel. Ovary (immature) broadly ovoid-acuminate, rather suddenly contracted towards apex in forming a long beak; style 0; stigma 3-lobed, puberulous; anthers (abortive) opposite segments, arising from segmental nerve at edge of cup, minute, long, filiform, sub-hastate.

Hab. Woods, hilly country north of Napier, County of Wairoa; 1886: *Mr. A. Hamilton.*

Obs. A very peculiar species, unlike all others of the genus known to me; yet possessing near affinity to *A. spicata*, [268] Col.,¹⁴⁶ from which it differs in habit, length of leaves, panicle, pedicelled flowers, large loose perianth, and shape of ovary. Unfortunately I have had only *one* female specimen (all that was collected) to

146 WC: "Trans. N.Z. Inst.", vol. xiv., p. 335.

examine; this, however, was perfect and in good condition, except its immature fruit.

3. *A. subrigida*,¹⁴⁷ sp. nov.

Plant epiphytal, perennial, densely cæspitose. Leaves, about 20 to a single tuft or plant, rather short, equitant, diverging fan-like regularly and distichously from the base, which is sub-cylindrical, not triquetrous, linear-acuminate, 9–11 inches long, 4 lines wide, erect, sub-rigid, tips sharp, sub-coriaceous, glabrous, yellowish-green, striate, 10–12-nerved; nerves strong; the upper portion of the under-surface closely appressed with short greenish-grey glossy hairs, having a minutely pitted appearance; dark-brown, gradually dilated and largely clasping at base, with white shining hairs at the extreme base only. *Female*: Scape (including panicle) 12–14 inches long, rather slender, trigonous, woody, hard, thickly pilose above with appressed hairs, and shaggy at the base; hairs white, glossy; panicle very compact, short, sub-ovate, 5 inches long, composed of 7 sub-panicles; the lower three being compound, each containing 3 small racemes, the middle one longest, 2½ inches long, and the two laterals short, about 1 inch; the upper four being short simple racemes; each sub-panicle with a long membranous bract at base, the lowest one being 7 inches long, broad below, but soon very narrow, and much acuminate. Flowers very compact, brownish; pedicels stout, short, about $\frac{1}{10}$ inch; perianth rather small, spreading, 6-fid to base, the three outer lobes larger than the three inner ones. Fruit small, globular, 1½ lines

147 *Astelia solandri* A.Cunn.

diameter, dull glaucous-green; style short, thick; stigmas 3, large, coalescing; seeds small, 12–18, sub-lunate-pyriform, thickest at apex, black, shining, minutely and thickly tuberculate (*sub lente*), gibbous on one side, slightly obtusely angled on the other, testa produced at funiculus end, sub-trifid.

Hab. High up in the upper forks of large forest trees, where the plant forms large dense masses; woods near Norsewood, County of Waipawa; 1886: *W.C.*

Obs. This species of *Astelia* I have long known in its leafing state, but failed (until this year) in obtaining it in flower and fruit, and then only perfect female scapes; the male scapes being similar in size, etc., but old, or too long past flowering for accurate description. From the great quantity of barren plants that I have seen and examined at various seasons, I should suppose this species to flower but rarely. It seems to be widely different from all known and described species; approaching, [269] however, on the one hand *A. spicata*, Col.,¹⁴⁸ (which also very rarely flowers), and serving to unite that small species in a natural and progressive series with the larger species of the genus. I yet hope to succeed in obtaining the perfect male flowers during the approaching summer.

148 WC: Vide "Trans. N.Z. Inst." vol. xiv., p. 335 (female); and vol. xvi., p. 340 (male).

ORDER IX.—JUNCEÆ.**Genus 1. Juncus, Linn.****1. *J. luxurians*,¹⁴⁹ sp. nov.**

Plant perennial; stout, tall, dark-green, forming thick bushy tufts and patches, that are sub-erect, drooping, and prostrate; rhizome creeping, with many small scale-like bracts, and sending up numerous new shoots every year; roots fibrous. Culms terete, leafless, 6–8½ feet long, 2 lines diameter below, smooth, minutely striate, upper portions soft and tender; tips very acuminate and sharp; the bases brown, glossy, with 3–4 adpressed sheathing bracts, the longest about 12 inches long; tips of bracts thin, very obtuse, sometimes acute; pith soft, woolly, and not continuous, yet not regularly broken or jointed.

Panicle lateral, 8–12 inches from tips, large, effuse, pale-green, fascicled, sub 20 branchlets mostly compound; 1–3 being very large, stout, compressed, 2–3 inches long, each bearing at tip sub 10 compound branchlets; involucral bracts 1½ lines long, ovate-acuminate, very acute, membranous, white with a brown central nerve. Flowers $\frac{1}{10}$ inch long, bibracteolate at base; bracteoles ovate, acute, membranous, white; pedicelled, pedicels long slender; perianth segments lanceolate-acuminate, very acute, rather longer than capsule, their centres bright green with broad white membranous margins. Stamens, 3; anthers small, yellow, oblong, with a minute connective; filaments short, rather broad. Stigmas 3, long and spreading, rumpled, plumose, dark-red. Capsule sub-prismatic, turgid, obtuse, very light brown, or dirty-

149 *Juncus effusus* L. var. *effusus*.

white, shining, less than 1 line long. Seeds small, numerous, bright yellowish-brown, convex, oblong, sub-clavate; testa not produced.

Hab. In wet swampy hollows between hills, in a dense forest south of Norsewood, County of Waipawa; 1885–6, *W.C.*

Obs. This remarkably fine rush is found growing in middlesized tufts, and also in very large and dense patches, with the ground thickly strewed with them in a prostrate state, forming several layers, all living and dark-green. It is rather difficult to force one's way through a large sub-erect patch, owing to their height, their very close growth, and their being so greatly [270] entangled. Its extreme softness and tenderness (for a rush), its great length, and its prostrate habit, led me to suspect its being a *species nova* when I first saw it; but at that time (winter) I could not procure any good specimens. Through its being so soft and tender it is much browsed on and trampled by cattle, so that it is rather difficult to obtain whole and perfect specimens. Hitherto I have only noticed it growing in that one undisturbed forest swamp, where, however, it is plentiful.

ORDER XI.—CYPERACEÆ.

Genus 13. *Uncinia*, Persoon.

1. *U. polyneura*,¹⁵⁰ sp. nov.

150 *Inc. sed..*

Plant perennial, clear green, densely cæspitose, forming large bushy tufts, with numerous brown ovate bracts at base, deeply costate. Culms erect, 20 inches long, smooth, unequally triquetrous, the upper portion channelled on the two narrower sides; usually with 4 sheathing leaves nearly together at base, Leaves sub-erect and drooping, linear, long and narrow, 22 inches long, 2 lines wide, very acuminate; tips obtuse, thickened and very closely serrulate; their bases much sulkated; striæ broad, smooth, dark-brown; the upper surface glabrous, regularly striate, many and finely nerved (sub 24), with 3–5 stout whitish nerves equidistant between mid-rib and margin on each side; the lower surface finely scabrid; mid-rib narrow, smooth, slightly keeled in upper portion but very prominently so in the lower; margins closely serrulate; vagina entire, crescent-shaped, membranous; ligula small, sub-lunate, extending from midrib to margin. Spikelet 5–6 inches long, rather slender, lax; the upper 1½ inches male, dark-brown, cylindrical and narrow; the denticulation of rhachis very deep, with raised and thickened edges; bract 0. Glumes closely imbricate, nearly 2½ lines long, narrow, ovate-acuminate, obtuse, margin of tip irregular (*sub lente*), dark-brown, obscurely striped, striate and prominently so at sides. Utricle 2½ lines long, a little longer than the glume, narrow, spindle-shaped, dark blackish-brown, glossy; bristle 2 lines long, slender, pale, much thickened and rugulose at the curve, tip of hook reflexed. Stigmas 3, long, lax, very shaggy, dark-brown.

Hab. Edges of forests and glades near Norsewood, County of Waipawa; 1886: W.C.

Obs. This plant in its general appearance has some affinity with *U. alopecuroides*, Col.,¹⁵¹ but differs in the culms being twice as long, differently angled, smooth, and bractless; in the leaves not being scabrid on both surfaces, and the midrib smooth; in [271] the spikelet being much more slender; in the glume being shorter than the utricle, and dissimilarly coloured and marked; in the utricle being longer than the glume and very dark brown; and in the bristle being shorter than the utricle.

**1886 A Description of some newly-discovered
Cryptogamic Plants, being a further
Contribution towards the making known the
Botany of New Zealand.**

Transactions of the New Zealand Institute 19: 271-301.¹⁵²

[Read before the Hawke's Bay Philosophical Institute,
11th October, 1886.]

INTRODUCTION.

ON this occasion, the last night of ordinary meeting of our Society for this year, I am again permitted to bring you our usual annual botanical offering, in a small basket

151 WC: "Trans. N.Z. Inst.," vol. xv., p. 335.

152 WC: In continuation of paper on same subject, read in the previous year. See "Trans. N.Z. Inst.," vol. xviii., pp. 219-255.

of Cryptogamic plants obtained from our inland woods and glens.

I have called it "*our*" offering; and this may require a few words in explanation. This plural pronoun is here used in a double sense: (1) To let you know that I have again been largely assisted by kind and liberal, hearty and active, coworkers in this part of the botanical field, who all work *con amore* in this matter: among them I would particularly mention with thanks three of our active members—Messrs. H. Hill, A. Hamilton, and D. P. Balfour—to whom not only myself and our local branch auxiliary Society, but the New Zealand Institute as a scientific body, are largely indebted. And (2) that this offering or tribute is one made *by*, as well as from, our New Zealand woods. For, privileged as I am to present and make known this, their free gift, and thus for a short time briefly occupying the position of their herald or ambassador unto you—coming hither directly from them, and from long and oft-repeated sojournings in their homes and company, and understanding their thoughts and quiet reasonings, and silent yet the more expressive language—I would beg permission to say a few words respecting them.

Among the many and varied congenial homes of the great Cryptogamic family, in those deeply secluded glens and mountain woods, far away from the busy life of towns, and even the solitary haunts of the isolated "bush" woodman, is the place *par excellence* for the disciple of Nature to study, to admire, to learn, to know; and so learning, so knowing, to hold converse with her and her beauties; and, through their teachings, with [272] the one

Great Mind and Author of all! One of our esteemed British classical poets, Thomson, in writing on this subject, has truly said,—

“Here wandering oft,
I solitary court
Th’ inspiring scene: and meditate the book
Of Nature ever open.”

For (as I have said to you on a former occasion) I believe in the universal language of Nature: and it is with feelings such as those that I have not unfrequently detected new and hitherto hidden and unknown novelties; and when thankfully gathering them have sometimes said, *solas*, or spoken out to them: “Come out of your obscurity, and be seen in society. Come and be introduced to science. Come and add your tribute also, however small, to the further display of the many great and wonderful perfections of Nature; and, in so doing, more openly fulfil the imperative injunction made to you two thousand years ago, in the words of that very ancient song: ‘*Benedicite universa germinantia in terra Domino; laudate et superexaltate eum in sæcula.*’”¹⁵³ And then, at such times, I have further thought: How many thousands of years—may be, myriads of ages—since this wee little wondrous delicate and frail yet perfect form first appeared, whether created or evolved; and how, in spite of all opposing and powerful elemental influences, and cataclysms, and volcanic eruptions, has this little microscopical plant held its own, fructifying, and shedding its tiny seeds in their proper season, and so

153 Bless the Lord, mountains and hills; sing praise to him and highly exalt him for ever. Daniel 3: 57.

overcoming and riding triumphant over all opposition and every adverse power? Moreover, when I have also occasionally found a little Cryptogam which I knew to be also a denizen of another part of the globe—it may be of the Antarctic islets furthest South, or of Tasmania, or Australia, or the Islands of Polynesia; or of the far-off specks in the vast Southern Ocean, the Crozets, or Kerguelen's Land; of the Cape of Good Hope, or Cape Horn; of the Peruvian Andes, or of the European Alps; of the riparian banks of the Amazon, the Thames, the Tweed, or the Shannon; of the summits of our own Ruahine Mountains, or of the Scottish Highlands—what a further theme for thought! Where the commencement, the outset, the *Alpha*, the origin? or were there originally more than one such? And, if so, did such embryos, situated at the antipodes of each other, commence life together?

Possibly, or rather very likely, some of the younger portion of my audience here this evening may think these remarks of mine strange, aberrant, or at all events peculiar; pertaining, it may also be thought, to the garrulity of old age, and following as a fitting sequence to my expressed belief in the universal language of Nature. To all such, (if there be any), I would merely reply that thoughts like those I have touched on are [273] (1) not unreasonable; (2) are eminently pleasing, illuminating, and informing; (3) are qualified to raise our human nature; and (4) to lead us on to more correct views of the Great Father and Author of all. Once more will I quote a few highly expressive lines from my favourite poet Thomson:—

"Nature, attend! join every living soul,
Beneath the spacious temple of the sky,
In adoration join; and ardent raise
One general song—to HIM!
Soft-roll your incense, herbs, and fruits, and flowers,
In mingled clouds to HIM, whose sun exalts,
Whose breath perfumes you, and whose pencil paints."

But to leave the mountain-tops, first gilded by the sun, and the purer air of the balmy pine forests and heights, not to mention their kindred poetical musings, and to descend to the plains—to the technical and prosaic facts and descriptions of our few little Crypts.—I have to observe that four of the orders of the great Linnæan class *Cryptogamia* are here represented—viz., *Filices*, *Lycopods*, *Musci*, and *Hepaticæ*. Of the first order, or ferns, I have only one novelty, a species of *Lomaria*; of the second, or *Lycopodium*, I have also but one new species; of the third, or mosses, I have five new species, belonging to three genera—viz., *Polytrichum*, *Hypopterygium*, and *Hookeria*, all fine mosses and well represented here in New Zealand; and of the fourth, or liverworts, I have 40 species, pertaining to no less than 11 genera, some of which, as *Jungermannia*, *Plagiochila*, *Mastigobryum*, and *Frullania*, were already remarkably large and cosmopolite. In the "Synopsis Hepaticarum," published 40 years ago, *Plagiochila* possess 189 species, *Jungermannia* 195 species, *Mastigobryum* 64 species, and *Frullania* 155 species; and these large numbers of species have been subsequently increased with many more; indeed, out of this present small collection there are no less than 5 species of *Plagiochila*, 16 species of *Mastigobryum*, and 6 species of *Frullania*; while others

of those smaller and rarer genera now added to by me are still very limited, both as to the number of their known species and their area.

The total number of Cryptogamic novelties described in this paper is 47; and while all will prove interesting to the working botanist and devoted disciple of Nature, some of them, it is believed, will prove no less so to the cultivated and cursory, though less technically skilled, observer.

Lastly, and in conclusion, (as I do not wish to repeat my former observations over again, though equally applicable here), I would respectfully beg my hearers, being members of the Institute, to read and note what I have said in my introduction in my paper of last year on this subject, in connection with this present paper. [274]

Class III.—CRYPTOGAMIA.

ORDER I.—FILICES.

Genus 16.¹⁵⁴ *Lomaria*, Willdenow.

1. *L. intermedia*,¹⁵⁵ sp. nov.

Plant small; caudex $\frac{1}{2}$ — $\frac{3}{4}$ inch, indistinct, formed of the bases of old stipites and wiry roots; tufted, few fronded; fronds sub-erect and spreading, pinnate; stipes rather slender, blackish-brown, glabrous, succulent, somewhat brittle, deeply channelled above, as also is the rhachis. Sterile fronds, 7—8 inches long, (including short stipe, $\frac{3}{4}$

154 WC: The numbers attached to the orders and genera in this paper are those of them in the "Handbook Flora of N.Z."

155 *Blechnum membranaceum* (Hook.) Diels.

inch), 1 inch wide, linear-lanceolate, rachis, flexuous, green; pinnæ 16–18 pairs, alternate, distant, membranous, light-green, glossy, thickly dotted beneath with minute red scales, oblong, sides straight, very obtuse, margins crenate, adnate, the lower base much excised and sub-truncate, the upper base slightly sub-auriculate or produced, but not extended on rhachis, 3–4 lobes at top confluent, the uppermost lobe broadly ovate, obtuse; the lowermost 5–6 pairs of pinnæ small, sub-orbicular, and sometimes opposite; veins 4–5-jugate, obscure, the lower forked, upper simple, extending nearly to margin, tips clavate, the lowest basal vein always 3-branched, and proceeding from the rhachis, not the midrib: *fertile* fronds much longer and more slender, 9–11 inches (including stipe, 2 inches), pinnæ 16–18 pairs, alternate, very distant, sub $\frac{1}{2}$ inch, narrow linear almost filiform, 6–7 lines long, $\frac{1}{2}$ line wide, obtuse, margins sub-crenulate, presenting a regular knobbed or beaded appearance, arising from the clavate tips of the veins, adnate, slightly decurrent, ultimate lobe long and very narrow, the lowermost segments exceedingly small; rich red-brown; margin of indusium finely lacerate, as obtains in *L. filiformis*, A. Cunn.

Hab. Scattered in damp shaded localities, Seventy-Mile Bush, County of Waipawa; 1880–86: W.C. In forests near Palmerston, County of Manawatu; 1886: Mr. A. Hamilton.

Obs. I. This species is allied to several of our smaller *Lomariae*,—as, *L. lanceolata*, Spr., *L. pumila*, Raoul, *L.*

membranacea, and *L. oligoneuron*, Col.,¹⁵⁶—but more closely to *L. membranacea*, from which species it differs in its larger size, its crenate (not “dentato-serrate”) sterile pinnæ, which are also of a different shape, more obtuse and distant, excised at their lower and produced at their upper bases, much fewer veined, and minutely dotted with red scales beneath; while the fertile [275] pinnæ are also very much narrower, and adnate, with sub-crenulate margins. Those four species form a compact little natural group.

II. After long search, I found 4 small scales at the bases of 2 stipites. These are very short, about 1 line long, black, subulate, with a broad membranous and entire base, and large black oblong cells.

ORDER II.—LYCOPODIACEÆ.

Genus 2. *Lycopodium*, Linn.

1. *L. novæ-zealandicum*,¹⁵⁷ sp. nov.

Plant small, dependent, lax, soft; main stem slender, 3–4 inches long, single, leafy to base, once forked at top; forks $\frac{1}{2}$ –1 inch long, cylindrical. Leaves sub-trifarious, glabrous, shining pale-green, spotted with brown dots, lowermost rather distant, loose, spreading, recurved, sub-linear-spathulate, 4–6 lines long, $\frac{1}{2}$ line wide, transversely wrinkled, narrowed at base and slightly decurrent; tips sub-acuminate, obtuse, thickened, nerve broad and strong; margins entire, pale, sub-cartilaginous;

156 WC: *Vide* “Trans. N.Z. Inst.” vol. xvi., p. 346.

157 *Stet.*

upper leaves much smaller, closer, imbricate, sub-appressed, nerve obsolete. Capsules axillary in upper leaves of main stem and on forks, large for plant, orbicular with a deep sinus, broader than base of leaf, yellow; valves gaping, thickened at margins; spores sub-orbicular, minutely roughish. Scale—or capsule-leaves on forks, sub 2 lines long, subulate, erect, very obtuse at tips, much dilated at base, clasping.

Hab. Epiphytical on fern-trees, open marshy glades in low forest, bank of River Mangatawhainui, near Norsewood, County of Waipawa; 1886: W.C.

Obs. I. Of this little plant I obtained five specimens from three fern-trees, two of them in full fructification and nearly alike in size and shape; two of the barren specimens were a little larger (4–5 inches, main stem), but much the same in form; their colour greener.

II. This is a small species of the *Selago* section; apparently pretty closely allied to *L. taxifolium*, Sw., (*ap. fig.* Hook. et Grev. *Gen. Filicum*, tab. Ixxxviii.), a Jamaica and St. Helena species; but that plant is much larger, and its leaves are sub-sexfarious, rigid, and acute, and its capsules reniform. This plant is also nearly allied to *L. gnidioides*, Linn., a Cape and Mauritius species. It differs much from its nearest New Zealand congener, *L. varium*, Br., in its much smaller size, in its narrower leaves of a different shape, being more lax and remote, and not so thickly set around the stem, in the total absence of quadrangular spikes, its differently-shaped capsules, and its softness. Sir J.D. Hooker has given no less than five drawings of different forms of that variable species in his “Flora [276] Tasmaniæ,” (tab. clxx.), but

all without fructification. Another drawing of that species, with fruit and dissections, is also given by Sir W.J. Hooker, (*Ic. Filicum*, tab. 112), which is more in accordance with the New Zealand states of *L. varium*; but all differ widely from this plant.

ORDER IV.—MUSCI.

Genus 46. Polytrichum, Linn.

A. *Calyptra nearly glabrous.*

IV. POLYTRICHADELPHUS, C. Müell. (*Cyphoma*, Hook. fil. and Wilson.)

1. *P. polycarpum*,¹⁵⁸ sp. nov.

Stems erect, 2 inches high, rather stout, once forked, bare at base. Leaves $3\frac{1}{2}$ lines long, thickly set from near base, sub-patent, spreading and decurved below on stem, subulate, acute, glabrous, flat on upper surface not canaliculate, sub-rigid, opaque, narrowly margined, serrate, nerved throughout, darkgreen with brown tips, lurid in age; bases broad, sub-quadrata, 1 line wide, amplexicaul; cells very minute, sub-orbicular distinct and transverse in the margin of leaf near contraction, narrow linear-oblong in the basal portion; perichaetial shorter than stem-leaves. Fruit-stalks lateral, slender, erect, $1\frac{1}{2}$ inches long, slightly flexuous, twisted at top, light-red, shining, 4–5 to a branch. Capsule broadly oblong, a little contracted at mouth, sub-horizontal and inclined, 2 lines long, somewhat strumous, flat and slightly concave

158 *Stet.*

above, conspicuously 2-angled at the sides (sometimes obscurely 4-angled), semi-terete below; light-brown (becoming darker in age), shining, mouth orbicular; teeth 64, rather short, hyaline, acute, sinuses broadly rounded; the circular epiphragm radiate, margin uneven. Spores circular, transparent at centre. Calyptra longer than capsule, narrow linear, $2\frac{1}{2}$ lines long, straight, red, glabrous, tip obtuse, hirsute at extreme apex; hairs very short and thick; membranous and lacerate at base.

Hab. Hilly woods, east bases of Ruahine Mountain Range, County of Hawke's Bay; 1885: *Mr. A. Hamilton.*

Obs. This species will range under *Polytrichadelphus*, C. Müell., and is allied to *P. magellanicum*, Hedw. It differs however, from that species in its more simple stems, in its leaves being margined and more serrate, with much larger sub-quadrata bases, (resembling those of *P. giganteum*, Hook., as given by Schwaeg., tab. cccxxv.), and in their not being canaliculate and lamellate; also, in its slender seta, the sub-strumous form of its capsule with circular mouth, its shorter and more acute teeth with broader sinuses, and its longer calyptra. [277]

Genus 67. *Hypopterygium*, Bridel.

1. *H. hillii*,¹⁵⁹ sp. nov.

Plant closely cæspitose in small tufts. Stems about $\frac{1}{2}$ inch high, thickly tomentose throughout with dark brown tomentum. Frond sub-deltoid-orbicular, pale yellowish-green, 5–6 lines broad, the lower branches 2-pinnate, the upper simple. Leaves: on the stem, deltoid-acuminate,

159 *Hypopterygium didictyon* Müll. Hal.

nerveless, margins entire slightly uneven, cells long and narrow; on the primary branches, distichous, spreading, close and slightly imbricate, broadly ovate, much apiculate, dimidiate, very thin almost pellucid, stoutly margined; margins serrate; nerve extending about three-fourths of leaf; cells small and sub-orbicular at tips, larger and oblong at centre and base with minute interstitial cellules; dorsal leaves orbicular, very largely apiculate, the mucro stout and acute and nearly half the length of the leaf, margined, slightly denticulate near apex; nerve stout, extending beyond middle; cells as in those of the primary branches; perichaetial narrow-ovate, much acuminate, acute; cells very long and narrow.

Fruit-stalk, 5–7 to each plant, about $\frac{1}{2}$ inch long, reddish, erect, tip slightly curved. Capsule a little drooping, oblong, red, minutely and regularly papillose, broadest and tubercled near base; cells large, sub-orbicular-quadrata; outer teeth dark-brown, subulate, acuminate, with no median line but a dark line at margins, transversely sulcate; the inner teeth nearly as long as the outer, pale, subulate, acuminate, bifid, tips almost capillary, dark jointed. Calyptra as long as the capsule, dimidiate, narrow, subulate, acute, a little curved, whitish below, tip brown.

Hab. Forests, Daneverke, County of Waipawa; 1885; *Mr. H. Hill*: forests near Norsewood, same county; 1886: W.C.

Obs. This elegant little fern-like moss is allied to the smaller species of *Hypopterygium*, ("Sec. I. a. Leaves not mixed with bristles; ** branches 2-pinnate;") of which we have some half-dozen or more known and described

species, but it is very different from them all. I have, with much pleasure, named it after its discoverer, Mr. Henry Hill, B.A., Inspector of Government Schools for the Hawke's Bay District, whose ready zeal and care in collecting, and kindness and liberality in imparting botanical specimens of rare plants, I have long thankfully experienced, as my published botanical papers will abundantly testify.

2. *H. pachyneuron*,¹⁶⁰ sp. nov.

Plant, rhizome stoutish, creeping, 2–3 inches long, brown, slightly hairy. Stems single, distant on rhizome, erect, 1 inch high, rather slender, glabrous, leafy and green above, bare and brown below. Frond sub-orbicular-cordate in outline, $\frac{1}{2}$ inch [278] long, green, inclining to pale-green at tips of branches; branches bi-pinnate throughout, very close set and overlapping. Leaves: lateral, distichous, spreading, imbricate, ovate, acute, slightly and distantly serrate at tips, margined; nerve very stout and broad at base and extending beyond middle; cells rhomboidal, larger at base; the dorsal leaves broadly orbicular, apiculate, margined; margins entire, slightly uneven; nerve vanishing beyond middle; cells oblong, small at tip and margins, larger at centre and base; stem leaves similar to dorsal; perichaetial narrow oblong-lanceolate, very acuminate, entire; cells narrow oblong rectangular. Fruit-stalk: 8–9 on one plant, each singly arising from the base of a branch on the main stem, or from a fork of the primary branches, slender, erect, red, 5 lines high, shorter than frond; base very filiform,

160 *Hypopterygium didictyon* Müll. Hal.

vaginant; vagina large, cylindrical, dark-brown. Capsule sub-erect and horizontal, about 1 line long, oblong, reddish, smooth, slightly rugose at base; outer teeth dark-brown, subulate, with a dark median line, very closely transverse-sulcate, edges much roughened (sub-denticulate) with numerous dark teeth, greatly acuminate, tips flexuous, curved; inner teeth just as long as outer, pale, remotely barred with a median line, acuminate, bifid for one-third of length from tip, with three filiform jointed ciliæ, shorter than teeth, alternate between them.

Hab. Near Wairoa, Hawke's Bay; 1885: *Mr. A. Hamilton.*

Obs. This is another species of the same subsection as the preceding, and is also pretty closely allied to its known New Zealand congeners.

Genus 71. *Hookeria*, Smith.

Section 2. *MNIADELPHUS*.

α Leaves with thickened margins.

*** Leaves entire.*

1. *H. cataractæ*,¹⁶¹ sp. nov.

Plant growing in large spreading patches, 2–3 inches long, fragile, soft; stems stout, thick at top, dark, leafy throughout, branched above; branches long, divaricate, distant, flat, compressed, hairy, $\frac{1}{10}$ inch wide. Leaves small, $\frac{2}{3}$ line, sexfariously disposed, obovate-oblong, very obtuse, slightly narrowed at base, imbricate, very

161 *Distichophyllum crispulum* var. *adnatum* (Hook. f. & Wilson)
Dixon.

thin, glossy, of a pleasing bright-green (lighter in age), wavy, tips recurved, margin entire, thickened, and (with nerve) red in age; nerve extending $\frac{5}{6}$ of leaf, diverging near tip with a very short branch at divergence, stout at base, fine at top; cells orbicular, small, particularly at apex and sides, larger and oblong at lower centre and base; perichaetial leaves smaller and narrower, sub-apiculate, enclosing numerous cylindrical paraphyses, cells larger. Fruit-stalk arising from near [279] base of branchlet, $\frac{1}{2}$ inch long, erect, flexuous, slender, shining, dark-red, thickened at base and vaginant; vagina tubercled. Capsule smooth, shining, oblong, equal, rather less than 1 line long, brown, slightly tubercled at base, sub-erect and horizontal; cells small, oblong-orbicular; outer teeth much acuminate, dark-brown, closely trabeculate, free, with stout thickened margins, rough at edges with bars largely protruding towards tips, and two dark stout longitudinal medial lines close together; inner teeth long, very acuminate, finely hair-pointed, white, with distant trabeculae and a single median line. Operculum half the length of capsule, rostrate, reddish, smooth, shining, acuminate, acute, black-tipped, centre reddish-brown, base much fimbriate; fimbriae recurved, light-brown, obtuse, of unequal lengths.

Hab. Close to a waterfall, wet dripping-sides of shaded cliffs, banks of the River Mangatawhainui, near Norsewood, County of Waipawa; 1886: W.C.

Obs. A species allied to *H. concinna*, Col.,¹⁶² but much larger, and of a different habit, form of growth, and texture.

β. Leaves without thickened margins.

**** Leaves serrulate.**

2. *H. telmaphila*,¹⁶³ sp. nov.

Plant sub-erect, 1–1¼ inches high, simple and slightly branched; stems stout, dark-coloured, hairy at bases with long red wiry hairs. Leaves pale dusky-green, quadrifariously disposed, imbricate, not margined, minutely serrulate (*sub lente*); lateral spreading, 2½ lines long, broadly ovate, very obtuse, the base contracted and with the stout nerve presenting a sub-petiolate appearance; nerve extending ⅔ of leaf, very stout at base, ending abruptly with a short branch from the tip; cells large, orbicular, smaller at apex and sides; dorsal and ventral leaves adpressed, smaller, sub-orbicular, ovate; perichaetal numerous, small, very thin, ovate, acute, apex sharply serrulate, the margins entire; cells oblong. Fruit-stalk (immature) ½ inch long, black, stout, flexuous, twisted, much thickened at base. The leaves when dry are distant and much crisped, but soon expanding in water.

Hab. On the ground, edges of a swamp, dense forest near Norsewood, County of Waipawa; 1886: W.C.

162 WC: "Trans. N.Z. Inst.", vol. xviii., p. 229.

163 *Pterygophyllum dentatum* var. *robustum* (Hook. f. & Wilson)
Dixon.

Obs. A species near to *H. pseudopetiolata*, Col.,¹⁶⁴ but differing from that species in its larger size and very much larger and broader leaves, that are only very minutely serrulate and imbricate; their cells also are unequal, with a stouter and longer nerve. [280]

ORDER V.—HEPATICÆ.

Genus 2. Jungermannia, Linn.

1. *J. pygmaea*,¹⁶⁵ sp. nov.

Plant minute, erect, 2 (rarely 3) lines high, of close, compact growth, pale-green. Stems highly cellular. Leaves sub 20, orbicular, narrowed at base, semi-amplexicaul, not decurrent, imbricate, vertical, sub-recurved at tips, margin entire but slightly uneven; cells small, orbicular, and minutely beaded at apex of leaf, larger and oblong, with minute triangular cellules in the interstices in the centre and at the base, and minute sub-quadratae and regular at the margin, giving the leaf a margined appearance. Stipules 0. Perianth obovate, 6-lobed, and plicate, each lobe 3-toothed, the central tooth largest and ciliate with 5–6 short ciliæ; cells large, oblong-quadrangular. Seta slender, capillary, flexuous, 4½ lines long, highly cellular; cells narrow, longitudinal. Capsule small, brown; valves oval, obtuse, slightly margined, striate with dark-brown wavy lines and numerous minute transverse ones; cells oblong.

164 WC: "Trans. N.Z. Inst.", vol. xviii., p. 231.

165 Not found

Hab. On wet sides of clayey and sandstone cuttings, closely intermixed with a minute *Fissidens*, and forming one compact and spreading mass; Glenross, County of Hawke's Bay; 1886: *Mr. D. P. Balfour*.

Obs. A species very near to *J. humilissima*, Col., ("Trans. N.Z. Inst.", vol. xviii., p. 236, and to other small allied species mentioned there), but differing mainly from that species in the form of its perianth and its capsule, in the cells of its leaves, and in its smaller size.

Genus 3. *Plagiochila*, Nees and Mont.

1. *P. polycarpa*,¹⁶⁶ sp. nov.

Rhizome creeping, long, much branched. Stems dendroid, erect, 6–9 inches high, woody, sub-rigid, bare and compressed below cylindrical above, black, glossy, bipinnately branched; branches ascending and horizontal, very numerous, especially above, irregular in length—sometimes a branch as large and as thick as the main stem proceeds horizontally from it near the base. Leaves light-green when young, olive-green when old, much crisped when dry, closely set, imbricate, largely decurrent, ventral margins cilio-denticulate; teeth few, distant, but closer and smaller at apex; dorsal margin entire and very oblique; cells sub-orbicular. Main stem $2\frac{1}{2}$ lines wide (including leaves), leaves large, somewhat elliptic-orbicular, apices round, their ventral bases much produced and clasping; branches (with leaves) $1\frac{1}{2}$ lines wide, their leaves smaller and somewhat deltoid in outline; involucral sub-obovate, narrow, sub-vertical,

166 *Plagiochila stephensoniana* Mitt.

ciliate on ventral margin and at apex, dorsal margin entire. [281]

Perianth terminal on short lateral branchlets, green, broadly-elliptic, apiculate, sub-inflated, mouth large, gaping, lips entire, thickened, incurved, with 3–4 very minute ciliae (*sub lente*) at tip, the mucro sometimes split or minutely bifid; seta short, slightly exserted, nodding; capsule oval, dark red-brown, small for plant; valves oblong, obtuse; elaters bi-spiral, adhering largely to margins. The male plant is more slender, with smaller leaves, narrow spikes, and much attenuated apices.

Hab. In wet dark woods in deep gulleys between hills, growing luxuriantly and thickly in very large continuous patches of several feet, on rotten logs, roots and bases of trunks of large trees, completely covering them; near Norsewood, County of Waipawa; 1885–86: W.C.

Obs. This fine species will rank with those other known New Zealand dendroid *Plagiochilæ*,—viz., *P. gigantea*, Lind., *P. stephensoniana*, Mitt., *P. subsimilis*, Col.,¹⁶⁷ etc. It also has affinity with them all, mostly, perhaps, with *P. stephensoniana*, but differing from that species in its perianth and involucral leaves, colour, and manner of growth, being much and largely branched at the top. The form of its leaves on the ventral side in their upper basal portion is much like those of *P. deltoidea*, and *P. cristata*, Lind., (and of some others), being largely-produced and sub-amplexicaul.

167 WC: "Trans. N.Z. Inst.", vol. xiv., p. 340.

2. *P. obscura*,¹⁶⁸ sp. nov.

Rhizome creeping, long, stout. Stems dendroid, erect, 5–6 inches high, semi-depressed and sulcated below, dark, stout, leafy from base, much branched above; branches sub-tripinnate, reddish-brown. Leaves very numerous, close, imbricate, cordate, amplexicaul, sparsely ciliate-dentate at apex and apical portion of ventral margin; the dorsal base of leaf wavy and largely decurrent, and nearly meeting on the stem that of the opposite leaf; the base of the ventral margin much produced beyond the stem; the young leaves light-green, the old ones dark-green; cells minute, orbicular; guttulate, sub-opaque. Involucral leaves similar, but smaller and obovate; teeth coarse, each containing many cells. Perianth terminal on very short lateral branchlets, green, elliptic-orbicular, obtuse, apiculate, entire, the mucro having 4 short teeth (*sub lente*); seta exserted, very short; capsule small, oval, dark-brown; valves sub-acute.

Hab. On decaying logs and branches, wet dark woods near Norsewood, County of Waipawa; 1886: W.C.

Obs. A species allied to the preceding, *P. polycarpa*, but a smaller, coarser, and darker plant, with differently shaped and opaque leaves. [282]

3. *P. suborbiculata*,¹⁶⁹ sp. nov.

Plant dendroid, 3–4 inches high; stem (and main branches) black, bare at base, leafy above, tripinnately branched at top; branches long, irregular, spreading;

168 *Plagiochila arbuscula* (Brid.) L. & L.

169 *Plagiochila stephensoniana* Mitt.

sometimes a branch, with its numerous upper and close bushy branchlets, is larger than that whence it sprang; branchlets clear greenish-brown, curved, drooping, $2\frac{1}{2}$ lines wide (including leaves). Leaves alternate, distant on main stem and branches, closer on branchlets, but not much imbricate; green when young, dusky-green when old; those on main stem sub-reniform-orbicular, 2 lines diameter, horizontal, patent, slightly amplexicaul; on branches orbicular or orbicular-cordate; margins largely denticulato-ciliate (almost spiny), except the basal portion of the dorsal margin; teeth or spinous ciliæ reddish, irregular, coarse, jointed, the largest with 2–3 lateral cells at their bases; marginal interstices between teeth curved and rounded; cells large, orbicular, and oblong, with thick double walls and clear triangular dots in the interspaces, smaller and more compact in a regular line on the margins. Involucral similar, but larger and spreading. Perianth terminal, free, obovate, 3 lines long, curved, compressed; lips semicircular, much produced, ciliate-toothed, extending round apex and slightly down the sides; base cylindrical, peduncled.

Hab. Dry hilly forests near Norsewood, County of Waipawa; 1886: W.C.

Obs. This species is very near *P. gigantea*, Lind., which it much resembles in form and general appearance, though a smaller plant. It differs, however, from that species in its larger and more orbicular leaves and in their areolation, their margins being much more coarsely toothed and sub-spiny, and their dental interspaces rounded; its perianths, too, are much more round and produced at their tips, with longer, more numerous and

extensive ciliate teeth; and its involucral leaves are more distant and spreading.

4. *P. exilis*,¹⁷⁰ sp. nov.

Plant creeping at base, sub-erect, 3–4 inches high, excessively slender, few and loosely branched; branches diffuse, distant, long, often 3 branchlets opposite and near each other spring from near the top of the main stem, and a sub-horizontal one from close under perianth; stem (with leaves) $\frac{1}{10}$ inch wide, red, smooth. Leaves light-green, small, alternate, distant, obovate, apices very obtuse and truncate, closer and very slightly overlapping at tops of branches, ventral margin and apex coarsely and irregularly denticulate, (mostly 10 teeth on ventral margin and 2–3 at apex), dorsal margin entire, an oblique ridge or thickening near the margin extending to stem (giving the [283] appearance of a nerve), and this slightly decurrent on the stem parallel with the proper margin; cells minute, of various shapes and sizes (mostly oblong), rather opaque. Involucral leaves similar, but laciniate on both margins, the laciniæ larger, curved, and bi-laciniate. Perianths few, terminal on tips of main branches, free, peduncled, obovate-oblong, compressed, sides straight, mouth largely cilio-laciniate; lips scarcely rounded; cells as in leaves. Capsule slightly exserted, small, oval, reddish-brown; valves oblong, obtuse. *Male* plant still more slender, wiry, attenuated and diffuse; 3–4 small branchlets of spikes near the top of main stem, sub-fasciculate, the branchlet continued above the spike with

170 Not found.

the spikes double on it; spikes very narrow, 2 lines long; scales 3–4-toothed at apex, tips recurved.

Hab. On wet logs, etc., forming closely-growing loose tangled masses; low wet woods near Norsewood, County of Waipawa; 1886: W.C.

Obs. In general form and habit this species will rank near to *P. tenuis*, Lind., (an East Indian and West Indian species), and the male plant with that of *P. deltoidea*, Lind. It is also pretty closely allied to the following species, *P. distans*.

5. *P. distans*,¹⁷¹ sp. nov.

Plant creeping, slender, wiry, procumbent, and sub-erect. Stems delicate, 1½–2 inches high, leafy to base, simple, forked at top and sometimes sub-fascicled with 2–4 branchlets; tops of stems sub-flabellate; stems (including leaves) mostly about 1 line wide, the largest sometimes 1½ lines; stems light reddish-brown. Leaves on stems small, alternate, very distant, sub-obovate, dimidiate, flat, spreading, ventral margin much arched, dorsal straight, a few large distant teeth (4–7) at apex and on anterior portion of ventral margin, generally 3 spinous teeth at apex, the one at the outer anterior angle being the longest, dorsal margin entire; leaves generally larger at tops of branchlets and about the perianth, light green; cells orbicular, with thick walls and minute circular cellules in the interstices. Involucral leaves similar, erect. Perianths terminal on branchlets, obovate, $\frac{1}{10}$ inch long; mouth narrow; lips largely ciliate-dentate; teeth few,

171 Not found.

flexuous; cells as in leaves. *Male* plant still more slender, sometimes 3 spikes on a branch, with leaves in the interspaces, each spike about 1½ lines long; scales sub-erect, tips 2-fid. The tips of the branches are sometimes flagellate and scaly; some of the stems are also exceedingly fine and slender, being only ½ line wide, including their pinnate leaves.

Hab. On trees, in low wet woods, forming rather large and densely compact patches; near Norsewood, County of Waipawa; 1886: W.C. [284]

Obs. A species nearly allied to the preceding, *P. exilis*, mihi; and also to *P. distinctifolia*, Lind., a West Indian and South American species, (and also said by Lindenberg¹⁷² to have been “found in Dusky Bay, New Zealand, Herb. Hook.”; but it is not included by Sir J.D. Hooker in the “Flora N.Z.,” nor the “Handbook Flora N.Z.”; hence, I suppose, some slight error in the Dusky Bay *hab.*, possibly an error for Staten Land, near Cape Horn). This species differs from *P. exilis* in its leaves being less toothed with rounded apices, and without the oblique and decurrent ridge, so striking in the leaves of that plant, and also in their widely different areolation: the spikes, moreover, of the male plant of this species are much smaller, with only 2 teeth to their sub-erect (not recurved) scales. This species is also shorter and much more slender and filiform, and of a different habit of growth.

172 WC: “Species Hepaticarum”: fasciculus i., *Plagiochila*; appendix, p. 156.

Genus 7. Gottschea, Nees.

* Leaves stipulate.

1. *G. ciliistipula*,¹⁷³ sp. nov.

Plant gregarious, procumbent, imbricate in growth, creeping, soft, of a pleasing bright-green. Stems 1 inch long, 3–4 lines wide, simple, sometimes 1–2–3 short branches near top, flat, leafy throughout, with numerous dark-red rootlets below. Leaves very thin, all margins finely and closely serrulate; ventral lobe long, narrow, sub-acute, much finely plaited, the lower basal margin ciliate; dorsal lobe much shorter, broadly ovate, dimidiate, largely-arched, tip acute. Stipule quadrate, $\frac{1}{20}$ inch wide, quadrifid; lobes long, narrow, sinuate, sub-acute, largely ciliate; ciliæ long, subulate, acute, flexuous, 5–9-jointed, very glossy; sinuses large, round, broad and clear, plaited or ridged longitudinally downwards from base of each sinus, the ridges ciliate. Cells large, of various shapes and sizes—hexagonal, oblong, and quadrate. On the stem, in the axils between the two lobes, are 2–3 minute narrow highly-cellular ciliated phyllodia, their ciliæ also long-jointed and flexuous.

Hab. In large patches on rotten logs and trunks of trees, in a deep dark wood near Norsewood, County of Waipawa; 1886: W.C.

Obs. A species having affinity with *G. læte-virens*, *G. nitida*, and *G. trichotoma*, Col.,¹⁷⁴ but differing from

173 *Schistochila balfouriana* (Hook.f. & Taylor) Steph.

174 WC: "Trans. N.Z. Inst.", vol. xviii., pp. 238, 240.

them all in its beautifully plaited and cut stipules, ciliated with long, wavy, glossy ciliæ, as well as in other characters.

2. *G. compacta*,¹⁷⁵ sp. nov.

Plant procumbent, obovate, tapering, light-green, 1–2 inches long, 8 lines wide at top; stems flat, branched, stout, rooting, [285] hairy and scaly beneath at bases. Leaves alternate, distant on stem below, close, and slightly imbricate at their bases above, oblong, spreading, plaited about the tips, which are very thin, laciniate-lobed; lobes largely and sharply serrate; tip of the ventral lobe sub-acute, of the dorsal broad and obliquely truncate, and both finely serrate; axils clear; cells large, oblong, of various sizes, minutely and regularly papillose, but clear and orbicular at tips. Stipule large, free, 1½ lines wide, sub-cuneatequadrate, narrowest at base, much cilio-laciniate on three sides; laciniaæ long, flexuous, very acute, bifid; sinus long, margins subsinuate and laciniate.

Hab. Among mosses, on rotten logs in wet shaded woods, near Norsewood, County of Waipawa; 1886: W.C.

Obs. A species having pretty close affinity with *G. macroamphigastra*, Col.¹⁷⁶

175 This specific name should have been “laciniosa”, as Colenso later explained (footnote Trans. vol.21 p.54). Now *Schistochila repleta* (Hook f & Taylor) Steph.

176 WC: “Trans. N.Z. Inst.,” vol. xviii., p. 238.

2. *G. compacta*,¹⁷⁷ sp. nov.

Plant small, compactly gregarious, nestling together in little tufts or cushions, procumbent and sub-erect, with a profusion of dark-red rootlets below. Stem stout, leafy to base, simple, but often with 2–3 minute branchlets at top, $\frac{1}{4}$ – $\frac{3}{4}$ inch high, 3–8 lines wide at tip including branchlets; lower leaves green, but very pale-green at tops bearing the appearance of whitish round buds.

Leaves amplexicaul, closely imbricate; ventral lobe very thin, ovate-acuminate, acute, much plaited with fine short plaits or ridges running diagonally to margins, the upper margin finely serrate, the lower margin largely laciniate; cells large, oblong, clear, with minute orbicular interstitial ones; dorsal lobe broad, much arched, apex obliquely truncate and finely and sharply serrate, anterior margin slightly serrulate, the basal portion entire and overlapping; cells much as in the ventral lobe, but more crowded and not so clear. Stipules large (for the plant), bilobed half-way through, laciniate on all margins; laciniæ large, very cellular; cells large, oblong and clear below, orbicular and double-walled above.

Hab. On rotten logs, forming little dense closely-compacted patches, in low wet woods, near Norsewood, County of Waipawa; 1886: W.C.

Obs. A peculiar-looking little species, well marked, by its habit of growth and its handsome largely-laciniate stipules.

177 This specific name should have been "gregaria", as Colenso later explained (footnote Trans. vol.21 p.54). Now *Schistochila repleta* (Hook f & Taylor) Steph.

Genus 11. (*Gymnanthe*, Taylor.)

(1.) *Tylimanthus*, Mitten.

1. *T. furfuraceus*,¹⁷⁸ sp. nov.

Plant gregarious; rhizome creeping, much and intricately branched, succulent. Stems or fronds rising erect from rhizome, [286] $\frac{1}{2}$ –1 inch apart, stoutish, usually simple, (sometimes once branched, branch patent, horizontal), 2 inches high, 4 lines wide, flexuous, succulent, decurved, pale-green, the base of stipe bare with small distant leaflets above increasing in size upwards to the leaves. Leaves, sub 20 pairs on stem, alternate, pinnate, close-set, imbricate, wavy, somewhat quadrilateral-elliptic, apex truncate, rounded, and slightly retuse, sub-sessile, attached to stem only at posterior corner, slightly decurrent, tips and margins sub-recurved, closely serrulate on anterior margin, apex, and upper half of posterior margin, remainder entire; anterior margin arched, posterior nearly straight, the entire portion thickened; teeth irregular in size, broad at base, 2–3 cells in each; colour clear dark-green; cells various, oblong, triangular, etc., scattered; cell-walls thick, double. Involucre terminal, vertical, pendulous, cylindrical, 3 lines long, very narrow, obtuse, light-green, covered with a fine, minute, light-reddish scaly scurf.

Hab. On rotten logs, growing in large compact patches, in wet shaded forests near Norsewood; 1885–86: W.C.

Obs. This species has close affinity with *T. saccata*, (*Gymnanthe* of “Handbook N.Z. Flora,” and of “Species

178 *Tylimanthus saccatus* (Hook.) Mitt.

Hepaticarum,") but differs from it in its smaller size, more numerous, larger, closer, imbricate and wavy leaves, which are also of a different shape, as are also their cells, their margins more denticulate, and only adhering by the lower corner to the stem, and in its furfuraceous torus. I have very rarely found it in a fruiting state, and then only after long and diligent search.

2. ? *T. perpusillus*,¹⁷⁹ sp. nov.

Plant very small, delicate, pale-green; rhizome creeping, short, very slender. Stems erect, $\frac{1}{2}$ – $\frac{3}{4}$ inch high, densely compact and gregarious, slender, sub-succulent, simple, flexuous, slightly thickened at tips, 1 line wide including leaves, usually leafy to base. Leaves minute, alternate, usually distant, (sometimes close and subimbricated at the middle), pinnate, mostly 12–14—(rarely 20-) jugate, sub-quadrata-orbicular, truncate, deeply notched or sub-bifid, the upper lobe larger, apices acute, sinus very broad, sometimes minutely toothed, sessile, clasping, slightly decurrent, a little twisted and convex, patent, margins entire; anterior margin arched, slightly uneven at apex; posterior straight, or slightly excised at base. Cells minute, crowded, sub-orbicular, their walls thickened, with scattered very minute cellules within them. Fruit not seen.

Hab. In shady damp niches, in the summit or peak of a high hill named "Cook's Tooth," near Porangahau, County of Waipawa; 1886: *Mr. H. Hill.*

179 *Marsupidium perpusillum* (Col.) EA Hodg.

Obs. A species having affinity with the preceding, *T. furfuraceus*, Col., to which it bears a striking general resemblance, [287] although a very much smaller plant. Notwithstanding my having received some scores of specimens, I have not found any bearing fruit; therefore it is only provisionally placed under this genus, at the same time I have no doubt of it belonging to it.

Genus 13. *Lepidozia*, Nees.

1. *L. latiloba*,¹⁸⁰ sp. nov.

Plant small, prostrate, recurved, spreading in patches; colour dusky-olive-green. Main stems 1–1½ inches long, bipinnate, leafy to base; branchlets numerous, alternate, ¼–¾ inch long, patent, irregular, curved, drooping; tips acuminate and flagellate. Leaves numerous, very close, imbricate, concave, glossy, quadrate or sub-palmate-quadrate, 4-lobed; lobes large, half the length of leaf, very broad at base, (each containing 6 lines of lateral cells), acuminate, tips acute, margins uneven, sinus very broad; cells distinct, minute and orbicular at margins and tips, larger and oblong in the centre and at base. Stipules same as leaves, only the lobes a little narrower and more acuminate, patent, tips incurved.

Hab. On ground or rotten wood, dark shaded woods near Norsewood, County of Waipawa; 1886: W.C.

Obs. A species having some affinity with *L. cupressina*, Lind., a West Indian, Chilian, and Tasmanian plant.

Genus 14. *Mastigobryum*, Nees.

180 *Lepidozia concinna* Colenso.

Section 1. Stipules quite free from the leaves.

* **Leaves quite entire.**

1. *M. obtusatum*,¹⁸¹ sp. nov.

Plant small, procumbent, weak, spreading, 1-1½ inches long, ½ line wide, dichotomous; branches uniform in width through-out; light-green. Leaves alternate, broadly elliptic, the dorsal slightly overlapping at the middle, the lowest smaller and distant, margins entire and somewhat irregular, the dorsal margin arched, the ventral nearly straight; apices of upper leaves entire, rounded, and very obtuse, of the lower leaves various, truncate, and 1-2-3 obsoletely dentate; cells orbicular, excessively minute, sub-opaque, contiguous in regular parallel lines, with a band of 3 longitudinal rows of larger and clearer cells near the ventral margin. Stipules minute, wider than stem, quadrate, largely 4-fid; laciniæ long, spreading, acute; cells oblong-quadrata, very clear, brown. Flagellæ few, long.

Hab. Woods near Norsewood, County of Waipawa;
1886: W.C.

Obs. A species very near to *M. convexum*, Lind. The band of 3 rows of large cells closely resembles a similar band in the leaves of *M. monilinerve*, Nees. [288]

** **Leaves 2-dentate or 2-fid.**

2. *M. amœnum*,¹⁸² sp. nov.

181 *Bazzania convexa* (Thunb.) Trevis.

182 *Acromastigum colensoanum* (Mitt.) A.Evans.

Small: stems 1–2 inches long, spreading, decurved, loosely dichotomous; branches leafy, equal, about $\frac{1}{2}$ inch long, $\frac{1}{20}$ inch wide (including leaves), cellular. Leaves very distinct, not imbricate, alternate and sub-opposite, oblong-quadrata, margins slightly sinuous, dorsal edge arched, ventral nearly straight, truncate, largely bidentate, the upper lobe larger, sinus nearly one-third length of leaf, broad, sinuate; colour pleasing light grass-green; cells large, orbicular, alike throughout. Stipules excessively minute, free, adpressed, composed of 4–5 capillary cellular fimbriæ. Flagellæ numerous, 3–4 to a branchlet, long, capillary. *Male* inflorescence from upper axils of stipules, single and geminate, sub-pedicelled, highly cellular; perianth campanulate, 5–7 fissured, laciniæ ovate-acuminate, enclosing an orbicular head of 10–12 minute cylindrical reddish sacs.

Hab. In dense forests near Norsewood, County of Waipawa; 1886: W.C. Running over and into cushions of *Leucobryum candidum*.

Obs. A species having affinity with *M. colensoanum*, Hook. fil., but differing from that species in its leaves not being imbricated, and in its stipules being minute and capillary-laciniate.

3. *M. minutulum*,¹⁸³ sp. nov.

Plant very small, 4–5 lines (rarely $\frac{1}{2}$ inch) high; dark green. Stems rather stout (for the plant), cellular, usually once forked; branches few, short, leafy, sub $\frac{1}{25}$ th inch wide, including leaves. Leaves distant below, close and loosely imbricated above, narrow oblong-quadrata, sub-

183 *Acromastigum colensoanum* (Mitt.) A.Evans.

falcate, slightly curved at dorsal margin, contracted at base, margins narrowly thickened and irregular, truncate, bidentate, tips somewhat obtuse, the upper lobe larger, sinus large, wide, edges irregular, cells perfectly orbicular, with minute interstitial ones. Stipules distant, excessively minute, lacinate, appressed. Flagellæ short, stoutish, scaly.

Hab. On the ground, but mostly confined to decaying dry vegetable matter; in dense wet woods near Norsewood, County of Waipawa; 1886: W.C.

*** Leaves 8-dentate or 3-fid.

4. *M. elegans*,¹⁸⁴ sp. nov.

Plant compactly tufted, erect; stems 2–4 inches high, dichotomous; branches simply forked above, 2 lines wide, uniform throughout; tips recurved; light green, margins often tinged with pink. Leaves numerous, close-set, opposite, slightly imbricate at dorsal bases, spreading, convex, broadly ovate or [289] sub-orbicular, truncate, trifid, teeth long and sharp, with minute teeth between them; dorsal margin largely rounded at base and overlapping stem; ventral margin sub-sinuate, slightly denticulate near apex, waved, with 1 large regular plait near the base to meet the stipule; cells small, orbicular, with minute interstitial cells, larger and oblong at base. Stipules free, large, 1 line wide, distant, quadrate, patent, recurved, in a regular line with bases of leaves and apparently connate, but really distinct, though approaching very close, somewhat 6–8 lobed on three sides; lobes irregular, lacinate; laciniæ acuminate, acute;

184 *Bazzania involuta* (Mont.) Kuntze.

cells small, oblong-orbicular. Flagellæ rather numerous below, few above, about 3 to a main branch, short, stout, scaly, issuing from above a stipule in the centre of the stem.

Hab. In dry craggy *Fagus* woods, growing compactly together on the ground with *Bartramia readeriana*, but only observed in two or three spots; banks of the River Mangatawhainui, near Norsewood, County of Waipawa; 1881–86: W.C.

Obs. A very elegant and striking species; scarcely allied to any of its numerous New Zealand congeners, and much more resembling *Isotachis* in its general appearance. The lower single stems with their leaves are always of a light-brown colour, presenting a dead appearance.

5. *M. macro-amphigastrum*,¹⁸⁵ sp. nov.

Plant rather stout, firm, 2 inches long, 2–3 inches wide, dichotomous, spreading, of a pleasing dark-green colour; branches equal, 1½ lines wide, leafy throughout, much flagellate. Leaves opposite, closely imbricate, oblong, falcate, convex, truncate, trifid, sinuses very large and minutely and irregularly toothed, margins entire; dorsal margin much arched; ventral margin slightly sinuate at tip, dilated at base, largely incised in the middle, and abruptly truncate at extreme base to meet the stipule, which it does very closely though not connate; cells minute, orbicular, distinct at tips, crowded in the body of the leaf, each cell containing 2–3 pellucid dots. Stipules free, large, sub-deltoid-truncate, produced, patent, set

185 *Bazzania adnexa* (Lehm. & Lindenb.) Trevis. .

slightly above where the two opposite leaves meet the stem, margins coloured brownish-red, recurved, and much laciniate; laciniæ sharp; cells irregular, oblong-rhomboidal at apex, smaller and orbicular at base. Flagellæ short, stout, scaly, branched, thickened at tips, by which they adhere rather strongly.

Hab. In low wet shaded woods near Norsewood, County of Waipawa; 1886: W.C. On close, compactly-growing mosses, and on other *Hepaticæ*, overrunning them. [290]

6. *M. imbricatistipulum*,¹⁸⁶ sp. nov.

Plant small, delicate, of close compact growth, erect, $\frac{1}{2}$ – $\frac{3}{4}$ inch high, simple and forked, sometimes branched at base and dichotomous; branches short, about 1 line wide; pale green; flagellæ few, short. Leaves opposite, slightly imbricated, obovate-oblong, truncate, trifid, teeth large, acute, sinuses entire, margins slightly irregular, the ventral more so and slightly incised in the middle: the dorsal margin arched near base; cells minute, orbicular, crowded, distinct at tips, larger and clearer in body of leaf and base. Stipules free, close, quadrate, sub-adpressed with the upper margin overlapping the stipule above, and laciniate-toothed, the sides usually straight and entire; cells orbicular.

Hab. Among mosses on rotten logs, in wet forests near

186 *Bazzania hochstetteri* (Reichardt) E. A Hodgs.

Norsewood, County of Waipawa; 1886: W.C.

7. *M. pusillum*,¹⁸⁷ sp. nov.

Plant creeping, delicate, small, sub ½-inch long, dichotomous; branches spreading, arched, light-green. Leaves opposite, close-set, regular, slightly imbricate near their bases, narrow-oblong, broadest at base, falcate, margins entire and slightly uneven, truncate, trifid; teeth large, spreading; sinuses broad and clear, the upper one usually larger; apical cells small, oblong *distinct* and regularly disposed, the central appearing as if compound, or composed of the figure “8” within each cell, the basal crowded and opaque. Stipules large (for plant), subquadrate, irregularly toothed on their three sides; teeth sometimes bi-cuspidate; cells oblong, distinct, regular, and clearer at margins and teeth. Flagellæ few, short.

Hab. On trunks of fern-trees, forests near Norsewood, County of Waipawa; 1886: W.C.

8. *M. olivaceum*,¹⁸⁸ sp. nov.

Stems 1½ inches long, dark-brown, stout, loosely forked above with few branches; branches ½–¾ inch long, 1½ lines wide. Leaves closely set, imbricate, dark-olive, rather opaque, oblong-linear, falcate, arched above, slightly narrowed at tip, truncate, largely 3-dentate with minute intermediate teeth or points, which also extend on lateral margins for some distance from apex, especially on the dorsal margin; cells minute, orbicular or orbicular-oblong, discrete (guttulate) as in *M. novœzealandiœ*.

187 *Bazzania hochstetteri* (Reichardt) E. A Hodgs.

188 *Bazzania adnexa* (Lehm & Lindenb) Trevis.

Stipules large, wider than stem, patent, membranaceous, semi-orbicular-quadrata, much laciniate with 6–7 long teeth or laciniae, and several smaller ones between them; cells oblong-rhomoidal at margins, small at base. Flagellæ short, rigid, dark-coloured.

Hab. Forests near Norsewood, County of Waipawa; 1886; W.C. [291]

9. *M. polyodon*,¹⁸⁹ sp. nov.

Plant creeping, 1½–2 inches long, leafy to base, stout, decurved, dichotomous; branches short, $\frac{1}{10}$ th inch wide including leaves; of a pleasing dark-green colour. Leaves, opposite, recurved, broad, sub-quadrilateral, (or somewhat equilateral-triangular excluding the tip), dorsal margin much arched, the ventral nearly straight, their bases overlapping on stem, truncate, trifid, with 2–3 small teeth in each sinus, and several minute distant teeth on each margin below apex, but more on the ventral margin; cells oblong, crowded, distinct in regular rows, very minute at apex and margins, larger in centre and at base, apparently compound, each being dark with an orbicular light centre. Stipules free, quadrate, broadest at base, wider than stem, recurved, much toothed on three sides; teeth acute and bi-cuspidate, each composed of 2 clear longitudinal cellules; the apical and marginal cells large, clear, rhomboidal rectangular and oblong; the central and basal cells minute, orbicular and crowded. Flagellæ short, thickish.

189 *Bazzania adnexa* (Lehm. & Lindenb.) Trevis.

Hab. On the ground, in dry shady forests near Norsewood, County of Waipawa; 1886: W.C.

Obs. The stipules of this plant are a strikingly beautiful object under the microscope.

10. *M. compactum*,¹⁹⁰ sp. nov.

Plant creeping and sub-erect, firm, short, $\frac{3}{4}$ –1 inch high, simple and shortly branched above; stems, including leaves, $\frac{1}{10}$ inch wide; light-green with an olive tint.

Leaves opposite, close-set, lower half largely imbricate and overlapping stem at their bases, ovate, truncate, margins irregular and slightly subdenticulate, the dorsal margin arched, the ventral nearly straight, sinus broad, the lower smaller and more acute, sometimes a minute tooth in either; cells small, sub-orbicular, distinct, guttulate in regular sub-parallel lines, much larger and clearer in the middle and on to the base. Stipules free, but posited close to bases of leaves as if connate, oblong- or reniform-quadrata, recurved, much toothed or jagged; teeth 6–10, short, acute, irregular; the upper cells adjoining each other and clear, but distinct and smaller below.

Hab. On trunks and large limbs of trees, forming small thick cushion-like patches; forests near Norsewood, County of Waipawa; 1886: W.C.

11. *M. heterophyllum*,¹⁹¹ sp. nov.

190 *Bazzania adnexa* (Lehm & Lindenb) Trevis

191 *Bazzania adnexa* (Lehm. & Lindenb.) Trevis.

Plant procumbent, creeping, 1–1½ inches long, spreading, simple and forked, light-green; branches few, capillary, $\frac{1}{20}$ inch wide, including leaves. Leaves fugacious, minute, opposite, oblong, close-set, sub-imbricate, the largest sub-quadrangular, broadest at base; margins entire, sinuate, the dorsal margin [292] arched; truncate, trifid, and bifid on branchlets intermixed; teeth long, acute; sinuses broad and somewhat irregular; cells oval-orbicular, distinct, guttulate, uniform. Stipules free, quadrangular, rather large, wider than stems, 4–6-toothed; teeth reddish, very cellular, reticulate; cellules minute, clear and adjoining above, oblong-orbicular, distinct, and crowded at base. Flagellæ few, stoutish, very scaly.

Hab. On trunks of fern-trees, forming large thick patches; dense forests near Norsewood, County of Waipawa; 1886: W.C.

12. *M. macrodontum*,¹⁹² sp. nov.

Plant procumbent, small, sub 1-inch long; stems stoutish, forked; branches short, $\frac{1}{10}$ th inch wide with leaves, dusky dark-green. Leaves opposite, close-set and imbricate, oblong, almost sub-quadrilateral, very broad at ventral base to meet stipule; the dorsal bases completely covering the stem and overlapping each other, slightly arched and falcate; margins entire and slightly uneven near apex, trifid; teeth irregular, large, broad, each containing several lateral cells, with usually 2 smaller teeth in each sinus; cells minute, broadly oval, distinct (guttulate), uniform, regularly disposed in lines. Stipules free, rather large, sub-quadrangular, broadest at base,

192 *Bazzania adnexa* (Lehm. & Lindenb.) Trevis.

irregularly toothed on three sides, highly cellular; apical and marginal cells large, clear, rhomboidal and oblong (parallelogrammic); those at base and one-third through towards centre orbicular, minute, and regular. Flagellæ short, stout.

Hab. On bark of trees in woods, hill country between Mohaka and Lake Waikare, County of Wairoa; 1886: *Mr. A. Hamilton.*

Obs. A species pretty near *M. olivaceum*.

13. *M. obscurum*,¹⁹³ sp. nov.

Plant gregarious, procumbent, creeping, pale green. Stems slender, weak, 1–1½ inches long, scarcely 1 line wide with leaves, flexuous, branched; branches rather long for plant. Leaves fugacious, alternate, thickish, opaque, close but scarcely imbricate above on stems, distant below, oblong-quadratae, truncate, trifid; teeth irregular and coarse; margins entire, the dorsal slightly arched; cells not discernible. Stipules free, small, adpressed, transparent and highly cellular, sub-quadratae, 4-fid; lobes very obtuse and rounded; cells large, sub-orbicular-quadratae, conjoined, uniform, each lobe containing 4 cells in a line laterally. Flagellæ 0 (sought, but not seen).

Hab. In woods, forming small compact patches; hill country between Mohaka and Lake Waikare, County of Wairoa; 1886: *Mr. A. Hamilton.* [293]

193 *Bazzania tayloriana* (Mitt) Kuntze.

14. *M. nitens*,¹⁹⁴ sp. nov.

Plant procumbent, creeping, pale yellowish-green, glossy. Stems 2 inches long, flexuous, wiry and bare below, stout above and very leafy, 1½ lines wide (including leaves), dichotomous, tips recurved. Leaves opposite, close, slightly imbricated, very regular, falcate, sub-oblong-quadrata, dimidiate, the basal portion more than twice as broad as the apical but not overlapping stem, truncate, trifid; teeth long, acute; sinus broad with sometimes a minute toothlet; narrowly margined, margins uneven, minutely and sparsely toothed on both sides near apex, dorsal margin much arched, ventral, excised. Cells minute, oblong-orbicular, distinct, nearly alike throughout, but large at basal centre. Stipules free, but as close as possible to bases of leaves as if connate, rather large, wider than stem, quadrate, patent, recurved, the margin coloured dark purple, laciniate-serrate above with 4–6 acute irregular teeth, those at the two angles largest; sides sinuous with generally 1 large tooth above the middle. Cells: central and basal very minute, oblong, distinct, ranged regularly in longitudinal rows; the marginal larger, clearer and united. Flagellæ very numerous; upper short, stout and scaly; lower, very long and filiform with hairy ends.

Hab. Woods near Norsewood, County of Waipawa; forming large thick patches on bark, and on dry vegetable débris; 1886: W.C.

Obs. A. species near *M. olivaceum*, also *M. compactum* (supra).

194 *Bazzania adnexa* (Lehm & Lindenb) Trevis.

15. *M. parasiticum*,¹⁹⁵ sp. nov.

Plant stoutish, creeping, dull pale-green; stems 1–1½ inches long, 1 line wide, dichotomous, much decurved at tips. Leaves opposite, close, imbricate, very regular, sub-convex, oblong, falcate, dimidiate; base twice the width of apex, sub-amplexicaul, truncate, trifid; teeth long, spreading, acute; the lower sinus larger, with occasionally a minute toothlet in it; margins slightly sub-sinuous, the dorsal much arched and overlapping stem, the ventral somewhat excised with the lowest portion adjoining stem wholly truncate. Cells: at lateral margins very minute oblong, closely compacted in longitudinal lines; larger sub-orbicular and distinct at apex; the central still larger, sub-quadrangular, and increasing in size to the base. Stipules free, rather large, very cellular, patent, recurved subreniform-quadrata, mostly 4-toothed at apex, and 1 tooth (sometimes 2) at sides; cells large, of various sizes and shapes, quadrangular, rhomboidal, and oblong. Flagellæ numerous, short, stout, and scaly.

Hab. In forests with the preceding species, *M. nitens*; growing luxuriantly on clumps of *Leucobryum candidum*; 1886: W.C. [294]

16. *M. obtusistipulum*,¹⁹⁶ sp. nov.

Plant prostrate, small, slender, repeatedly overlapping itself in growth; stems brown, stoutish, wiry, 1–1¼ inches long, ⅔ line wide (including leaves), simple, loosely and sparingly forked at top. Leaves small, pale

195 *Bazzania adnexa* (Lehm & Lindenb) Trevis.

196 *Bazzania tayloriana* (Mitt) Kuntze.

brownish-green, alternate, distant, tender, fugacious, opaque, very slightly adhering to stem, narrow oblong, broadest at base, truncate, trifid; teeth rather coarse, large and blunt; margins slightly uneven; dorsal margin much arched, the basal portion falcate; ventral margin nearly straight. Cells sub-orbicular, very obscure, but regularly disposed in rows between dark longitudinal lines, appearing as if each cell was composed of 5 cellules, separated by a star-like division, and as if there were two layers of superimposed cells. Stipules free, rather large (for plant), as broad as the leaves at their bases, distant, appressed, highly cellular, cuneate-quadrata, 4-lobed; lobes short, broad, and very obtuse. Flagellæ 0.

Hab. On the ground, thickly overrunning loose dry vegetable débris; low damp spots, forests near Norsewood, County of Waipawa; 1886: W.C.

Genus 19. *Polyotus*, Gottsche.

1. *P. smaragdinus*,¹⁹⁷ sp. nov.

Plant prostrate; stems creeping, 3–4 inches long, 2-pinnately branched; branches spreading, upper ones very long; branchlets numerous, alternate, diverging, irregular in length, 3–15 lines long. Leaves, a pleasing emerald-green, distichous, regular; stem leaves close, patent, not imbricate, broadly cordate-ovate, dimidiate, apiculate, margins entire but slightly uneven, with usually 4 large lacinia-like ciliæ at the base on each side; cells sub-orbicular, distinct; leaves on branches imbricate, orbicular-elliptic, largely apiculate, margins entire, auricles clavate, dark red when mature, with a minute

197 *Lepidolaena taylori* (Gottsche) Trevisan.

subulate fimbria at the base; cells large, hexagonal, with minute interstitial cellules. Stipules on main stems 4-partite, segments ciliato-laciniate all round, ciliæ jointed; sinuses long, clear; cells oblong; stipules on the branchlets similar but very minute, bearing 2 very small claviform appendages, similar to those on leaves but much smaller.

Hab. On bark of trees, and among mosses on the ground; dark woods near Norsewood, County of Waipawa; 1886: W.C.

Obs. This truly elegant species has affinity with both *P. claviger* and *P. palpebrifolius*, Gottsche, but differs from them and from all other known species in several particulars, especially in colour and in form of leaves and stipules.

2. *P. fimbriatus*,¹⁹⁸ sp. nov.

Plant prostrate, creeping; stems stout, flexuous. pendulous, 4–6 inches long, 3-pinnately branched; branches straggling, [295] very irregular in length, overlapping each other; branchlets numerous, close-set, alternate. Leaves mostly pale yellowish-brown, the upper layer and more exposed dark-orange and rich bright red-brown; main-stem leaves sub-imbricate above on stem with crisp sub-vertical margins, having a fissured scaly appearance, orbicular-cordate, very apiculate, margins entire but slightly uneven, largely amplexicaul, the sinus broad and circular, with several long irregular-curved fimbriæ and ciliæ at base; branch leaves imbricate, distichous, sub-orbicular, apiculate (sometimes sub-acute

198 *Lepidolaena taylori* (Gottsche) Trevisan.

and obtuse), margins entire with long irregular laciniate fimbriæ at base; auricle clavate, dark-purple in age with several long flexuous fimbriæ at base; cells clear, orbicular, with minute interstitial cellules. Stipules on main stem large, sub-quadrata, 4-partite; segments largely ciliate on all sides; ciliæ long, recurved, flexuous, jointed; stipules on branchlets similar but smaller, with a dark boss or blotch at central base, and bearing two small dark claviform appendages similar to those on leaves, and ranging with them: cells oblong-orbicular, very clear, each of the segments having a narrow marginal line of compacted minute cells.

Hab. On trees, often overrunning mosses, etc., Seventy-mile Bush, between Norsewood and Woodville, County of Waipawa; 1885–86: W.C.

Obs. A species allied to the preceding, *P. smaragdinus*; but more nearly to *P. claviger*, and *P. taylori*, Gottsche. It is, however, a much larger, robust, and coarser plant; differing from them, and from all known species, in its large clasping and fimbriate stem-leaves, its largely fimbriate and ciliate stipules, and in its rich striking colours.

Genus 21. *Madotheca*, Dumort.

1. *M. latifolia*,¹⁹⁹ sp. nov.

Plant prostrate, creeping, diffuse. Stems stout, brown, 3–4 inches long, 2½ lines wide, bipinnate; spreading irregularly over each other in loose horizontal layers, and so forming small cushioned tufts; branches alternate,

199 *Porella elegantula* (Mont.) E.A.Hodgs.

short, flat, patent. Leaves darkish-green when fresh, (young leaves and branchlets light-green), closely and uniformly set, much imbricated, convex, reniform-orbicular, decurved, dorsal margin entire, the apex or outer angle much incurved, base waved; the ventral lateral margin on stem very uneven; lobule sub-orbicular-elliptic, larger than stipule, crisp; cells orbicular, with thick walls and minute interstitial cellules; involucral 4, oblong-ovate, (2 of them being smaller and narrower), largely ciliate; ciliæ jointed; cells as in leaves, only larger and clearer at centre and base; a dark-green outer leaf largely produced and sub-vertical, much incurved and enwrapping the apical margin, finely ciliate; capsule (immature) [296] enclosed, globular, dark-green. Stipule oblong, recurved, apex retuse, margin entire, much waved, especially at the base.

Hab. On branches of trees, slightly adhering to their bark, and to foliaceous lichens, and to its own under-branches; Seventy-mile Bush, County of Waipawa; 1882–86: W.C. Forest near Palmerston, County of Manawatu; 1886: *Mr. A. Hamilton.*

Obs. This species much resembles *M. stangeri*, Gottsche, (and its vars.), but it differs from them in the shape of its leaves, which are much more reniform or transversely elliptic, in its largely ciliated involucral leaves, in its oblong and retuse stipules that are not gibbous, and in its orbicular cells, as well as in its size and colour. It is a fine and pretty plant, and though its stems and branches are not so large and long as those of *M. stangeri*, they are quite as wide as the widest of them.

2. *M. amœna*,²⁰⁰ sp. nov.

Plant pendulous; stems 5–6 inches long, 2 $\frac{3}{4}$ lines wide, pinnate, mostly simple, few-branched and forked at tips; bases bare, black, wiry, sub-rigid; colour a lively light-green. Leaves closely regularly and largely imbricated, but not overlapping their opposite bases on stem, broadly elliptic, margins entire, the lateral sparingly and finely toothed towards stem, apex decurved; lobule very slightly affixed to leaf, oblong, broader at apex, ciliate; ciliæ irregular, jointed; cells small, orbicular, with minute interstitial cellules (much as in the preceding species *M. latifolia*, but smaller). Stipules small, rather distant, sub-deltoid-cordate, with rounded tip, and basal angles produced and clasping, tip recurved; narrowly margined, marginal cells minute, uniform; margins entire, but irregular at base; cells remarkably minute, and of various sizes and shapes, mostly oblong.

Hab. On trunks of trees, hilly forests, Glenross, County of Hawke's Bay; 1886: *Mr. D. P. Balfour.*

Obs. A species near to the preceding; and also to *M. stangeri*, and its vars.; but differing in its usual long simple form, in appearance and in colour, in the size of its cells, and particularly in the shape and structure of its small margined stipules, and in its different lobule.

Genus 23. *Frullania*, Raddi.

1. *F. novæ-zealandiæ*,²⁰¹ sp. nov.

200 Possibly *Porella elegantula* (Mont.) E.A.Hodgs.

201 *Frullania hampeana* Nees.

Stems slender, 1 inch long, wiry, flexuous, dark-coloured, pinnate, rarely bipinnate; branchlets few, alternate, irregular in length. Leaves pale-green, very slightly imbricate, broadly ovate, sub-acute and obtuse, margins irregular, ventral base patent not inflexed, those on [297] the main stem larger than on branches; lobule brown-purple, rather large and prominent, galeate with a long acuminate depending tip that is often recurved. Stipules: on main stems, sub-rhomboïd-quadrata, deeply bibbed; lobes divergent, tips acuminate, with 2 teeth on each lobe outside; on small branches, ovate, deeply bilobed; lobes lanceolate, entire. Cells minute, orbicular, regularly disposed in longitudinal lines.

Hab. On bark of trees, intermixed with other *Hepaticæ* and mosses; forests, Glenross, County of Hawke's Bay; 1886: *Mr. D. P. Balfour.*

Obs. A species belonging to Section 1, Division ***, p. 536 of "Handbook N.Z. Flora;" and having affinity with *F. hampeana*, Noes, and with *F. spinifera*, Hook. fil. et Tayl., but differing from them both in several particulars.

2. *F. delicatula*,²⁰² sp. nov.

Plant very minute, delicate pale-green. Stems slender, 1–1½ inches long, 1/30 inch wide (including leaves), bipinnate, irregularly and sparingly branched; branches rather long for the plant. Leaves round (longer than broad), close but not imbricate, margins entire and slightly recurved, basal portion not inflexed; lobule small, arched, slightly deflexed, tip obtuse, not produced beyond margin of leaf, pale purple. Cells minute, sub-

202 *Frullania falciloba* Tayl. ex Lehm.

orbicular, crowded, indistinct. Stipules reniform-orbicular, entire, adpressed.

Hab. Hilly woods at Pohue, north-west from Napier, County of Hawke's Bay; 1885. (A few fragments, found mixed among larger *Hepaticæ* collected there by Mr. A. Hamilton.)

Obs. A very filiform, delicate, tender plant, remarkable for its whole entire stipules.

3. *F. rotundifolia*,²⁰³ sp. nov.

Plant small, erect, not $\frac{1}{2}$ inch high, but growing thickly together in densely-compacted patches; dark green, but appearing blackish together in the mass.

Stems creeping, 2 inches long, bipinnate, wiry black and bare below, but stout, and of same colour as leaves, and very much branched at top; branchlets alternate, very short. Leaves very close-set, imbricate, patent, sub-vertical, wavy, recurved, rather opaque, orbicular; margins entire, but slightly irregular (*sub lente*); basal portion not inflexed, sub-amplexicaul; lobule small, sub-galeate, same colour as leaf, tip obtuse, not produced; involucral lanceolate, acuminate, very acute, margins entire. Stipules orbicular, with a small broad sinus at apex, which is broadest and rounded at base, and margined; tips somewhat conniving. Cells very small, sub-orbicular, with numerous exceedingly minute interstitial cellules. Perianth sub-terminal, [298] sub-cylindrical, slightly clavate, apiculate, smooth. Capsule oval, whitish; seta produced, nodding; valves oval,

203 *Frullania squarrosula* (Tayl.) E.A.Hodgs.

membranaceous, spreading, not cut to base; elaters as in *gen. descr.*

Hab. On upper branches of tall trees, adhering to bark and overrunning lichens (*Stictæ*); forests, Norsewood, County of Waipawa; 1886: W.C.

Obs. This species is rather peculiar; small though it is, it makes a show from its densely clustered habit of growth and patent sub-transverse leaves; it has also a pretty appearance when in fruit, with its spreading white 4-valved capsules peering above the tips of its dark leaves, resembling minute starry flowers. It is also singular from the curious sinus of its stipules, which, as far as I know, is quite a unique character.

4. *F. minutissima*,²⁰⁴ sp. nov.

Plant very small, about 2–3 lines high, erect, thickly gregarious, appearing black in the mass. Stems procumbent, sub $\frac{1}{2}$ inch long, much implexed, bipinnate; branchlets alternate, very short. Leaves on main stem distant, on branches close and touching but scarcely imbricate, sub-orbicular and broadly elliptic, margins entire, tips rounded and recurved, basal portion inflexed in a minute triangular interlobule or lobelet between lobule and stem, brownish, the young leaves and branchlets light-green; lobule large (for plant), nearly $\frac{2}{5}$ ths of leaf in size, distant from stem, elliptic-clavate, broadest at apex, erect a little inclined, produced at base slightly beyond margin of leaf, dark purple; involucral leaves oblong-ovate, apiculate, entire. Stipules orbicular,

204 *Frullania rostrata* (Hook. & Tayl.) Hook. f. & Tayl.

sinus large, angle acute at base and very broad at margin. Perianth obovoid, triangular, sides slightly concave, apex truncate, mucronate, mucro obtuse, dark brown, shining. Cells excessively minute, orbicular-oblong with microscopical interstitial cellules.

Hab. On branches of trees, forming thickly compact and spreading patches; banks of River Mangatawhainui, near Norsewood, County of Waipawa; 1886: W.C.

Obs. This very minute species is readily distinguished from all other known New Zealand species by its large erect lobule.

5. *F. scabriseta*,²⁰⁵ sp. nov.

Plant procumbent, creeping, spreading. Stems stout, 1–1½ inches long, brown, 3-pinnate, much branched; branches long, leafy throughout. Leaves alternate, close-set on main stem, slightly imbricate on branches, broadly oval, light-green, margins entire but slightly uneven, recurved; lobule same colour as leaves, small, arched, tip short, obtuse, scarcely produced beyond leaf; involucral leaves sub-obovate, entire; cells small, sub-oblong-angular, with thick walls composed of a chain of very minute [299] cellules. Perianth sub-inflated, narrow-oblong, triangular angles sharpish, apex rounded, mucronate, mucro obtuse, lips entire. Calyptra broadly clavate, green; seta white, nodding, sub-rugulose; valves broadly oval, obtuse, spreading, recurved, brown with a rather large white circular base; elaters numerous, reddish, stout, truncate, the tip of the hollow tube

205 *Frullania deplanata* Mitt.

containing the elater closed and capitate by the elater, and broader than the tube.

Hab. On trees, in low wet woods near Norsewood, County of Waipawa; 1886: W.C.

Obs. A species having some slight affinity with *F. spinifera*, Hook. fil. et Tayl., in its general appearance; but differing in leaves and lobules, in its more sharply-angled perianth with entire involucral leaves, in its scabrid seta, and in its peculiar capitate elaters.

6. *F. implexicaulis*,²⁰⁶ sp. nov.

Plant minute, much implexed and compact in small dark-coloured masses. Stems $\frac{3}{4}$ –1 inch long, 2-pinnate, flexuous, black, wiry. Leaves alternate, oblong-orbicircular, (sometimes broadly ovate and sub-acute on the branches), dimidiate, margins entire, sub-vertical and recurved on the main stem, convex and very close-set yet scarcely imbricate on the branches, brownish-green, the young leaves and branchlets bright-green; lobule large, set close to stem, prominent, hooded, the arch high, tip acute but not acuminate nor decurved, and scarcely produced beyond margin of leaf, brown-green; involucral leaves sub-obovate-oblong, entire; cells small, sub-orbicircular with minute interstitial cellules. Stipule small, convex, sub-orbicircular, broader than long with apex produced, narrowly margined, bifid; sinus large and deep, and wide at tips. Perianth oblong-obovate, sub-inflated, rugulose, plaited above, tip produced and obtuse

206 *Frullania implexicaulis* Colenso ex Hodgson.

with a mucro, mouth shortly fimbriate; calyptora turbinate; spores large, sub-angular, light-brown.

Hab. On pendent branches of living trees, forming small scattered much implexed dark clusters; edges of forests near Norsewood, County of Waipawa; 1886: W.C.

Obs. This species in its general appearance resembles *F. minutissima* (*supra*), although it differs widely in the habit of growth, as well as in several important characters (*vide descript.*).

Genus 25. Noteroclada, Taylor.

1. *N. longiuscula*,²⁰⁷ sp. nov.

Plant pale yellowish-brown, prostrate, creeping, adhering on ventral surface by numerous fine pale rootlets. Stems 3–4 inches long, $\frac{1}{10}$ inch wide (including leaves), simple below, [300] few-branched above, leafy throughout; branches alternate, long, irregular, tips involute. Leaves regular, very close, largely imbricate, sub-vertical, broadly oval, wavy, decurrent, margined; margins entire, but slightly irregular with a very narrow marginal line; leaves when dry secund, vertical above stem and closely appressed to each other. Cells minute orbicular, guttulate, smaller at margin, larger and clearer at base, with minute interstitial cellules. Involucræ (or perianth) terminal from a short stout branch near base, sessile, erect, sub-oblong-ovate 2 lines long, plaited at top, mouth large, tips finely lacerate. Two short scaly flagellæ depending from branch a little below the involucræ.

207 *Stet.*

Hab. Hilly woods at Pohue, north-west from Napier,
County of Hawke's Bay; 1885: *Mr. A. Hamilton.*

Obs. A species widely differing from the few other known ones. I have received several leafing specimens of this plant, but only one of them bore an involucre (old) and flagellæ more and perfect ones are wanted.

Genus 30. **Symphyogyna**, Mont. and Nees.

1. *S. platycalyptra*,²⁰⁸ sp. nov.

Plant diœcious, terrestrial, highly gregarious; stipitate, erect, rising from a short stout simple or few-branched succulent subterraneous rhizome, that is slightly hairy with fine weak hairs; generally 3 stipes, each about 1 inch apart, spring from one rhizome, the rhizomes being thickly matted. Frond circular, 1 inch diameter, of a pleasing green, divided into two main branches, that are again equally divided and largely overlapping, each flabellate division containing 3 branchlets, which are again dichotomous, and broadly margined to their bases; the main branches, however, are not margined; margins entire, slightly sinuous; main sinuses broad, open; ultimate sinuses narrow; lobes short, overlapping, broad in middle, not linear, much waved, apices retuse; cells small, orbicular; the nerve broad and strong, but not extending to apical margin. Stem stout, succulent, 1–2½ inches high, cylindrical below, compressed above.

Female plant: fructification regular, generally 2–4, solitary at upper forks beneath, sometimes, but rarely, 1 at the main forking; involucral scale large, 2 lines wide, sub-reniform, slightly bilobed, undulate, somewhat

208 *Hymenophyton flabellatum* (Labill.) Trevis.

plaited, recurved, with a glossy knobbed protuberance at the base; margin sub-sinuous, entire; cellules large, orbicular; 1–2 minute scales behind, and so enclosing calyptra. Calyptra very broad, $\frac{1}{10}$ th inch wide, 1½–2 lines long, flat, membranous, smooth, shining, slightly lacinate at apex, very light-green; cellules quadrangular-oblong. Capsule (immature within) globular, large, smooth, green, surrounded by 8–10 large cellular pistillidia that spring [301] from beneath. *Male* plant: fructification irregularly scattered beneath in sub-globular tubercular lumps on upper portion of stem and on the branches.

Hab. Plentiful in a muddy swamp, in a deep low dark shaded forest near Norsewood, County of Waipawa; 1886: W.C.

Obs. I. This species is peculiar from its wide, flat, strapshaped calyptra and its globular capsule, also from its strictly dioecious manner of growth. It forms dense compact patches or small beds, something like thick beds of young cress (*Lepidium sativum*) or parsley: and these are generally of two kinds or sizes: the larger (taller and bigger fronds and finer patches) contain only male plants, and the smaller and shorter the female ones, and these never appear to intermix. Indeed, I was a very long time (parts of two days), before I found a single female plant bearing fructification, and was about giving it up in despair, as I had confined my search to the finer masses; and it was only by chance that I happened to look among the smaller-sized plants.

II. This species has pretty close affinity with *S. longistipa*, *S. fetida*, and *S. megalolepis*, Col.,²⁰⁹ and with *S. flabellata*, Mont., ("N.Z. Flora,") but is distinct from them all.

1886 An Enumeration of Fungi recently discovered in New Zealand, with brief Notes on the Species Novæ.

Transactions of the New Zealand Institute 19: 301-313.

[Read before the Hawke's Bay Philosophical Institute, 13th September, 1886.]

LAST year (1885), I again sent a lot of Fungi to Kew,²¹⁰ London, which I had for the greater part discovered during the preceding twelve months, in my several visits to the dense forests and deep glens of the Seventy-mile Bush, County of Waipawa; a few of them also being from Napier. Most of them were forms that were new to me, although I knew some of their genera and allied species. Altogether they comprised about 400 separate packets, containing, however, a much larger number of specimens. I sent them to Kew, to the kind care of the late Director of the Royal Botanic Gardens, Sir J.D. Hooker, K.C.S.I., etc., in order to get them determined (if

209 WC: "Trans. N.Z. Inst," vol. xvi., pp. 353-365.

210 14 October 1855. See *Colenso's collections* p.350.

possible) by the eminent fungologist, Dr. Cooke, who had so very kindly done as much for a smaller lot, collected in the same localities, and sent thither by me in 1883. I have very recently received from the [302] present Director at Kew (J. T. Thiselton-Dyer, C.M.G., etc.), a long, complete, and valuable list of the same, as again kindly determined by Dr. Cooke; and this (under separate heads) I purpose now laying before you, omitting only those species which were already known and described in the "Handbook Flora of New Zealand," and also in my supplementary paper of newly-discovered Fungi, read before the Wellington Philosophical Society in 1884.²¹¹ I shall classify them thus:—

1. Foreign Fungi already described, but not before found in New Zealand;
2. Indigenous species wholly new to science, true *species novæ*.

The remainder will consist of species already described as inhabiting New Zealand—incomplete and imperfect specimens of *Mycelium*, etc., that cannot at present be determined; (on some of these, however, Dr. Cooke has observed, "it is possibly new;") specimens of minute Lichens²¹² having a semi-fungoid appearance; and a few species of small and allied terrestrial Algæ.

211 WC: Art xxviii., "Trans. N.Z. Inst.," vol. xvii., p. 265.

212 WC: These, however, were not sent as Lichens; of which order there are also a large number of specimens collected, to be hereafter examined. The same may also be said of the few packets of minute terrestrial Algæ contained in that parcel.

From these classified lists you will learn that out of the large number of species sent to Kew, (several of them being in duplicate and some in triplicate, arising from some species of Fungi being perennial, and to their varying states and ages, and to the different seasons in which they were collected), a total of 179 species are new to the New Zealand flora; and of these only 18 species have been determined as new to science.

FUNGI.

SECTION I.—Foreign Fungi already described, but not before found in New Zealand.

*Of genera known to inhabit New Zealand.

Genus 1.²¹³ *Agaricus*, Linn.

1. A. (*Amanita*) *vaginatus*, Fr.
2. A. (*Pleurotus*) *serotinus*, Fr.
3. A. (*Pleurotus*) *atrocæruleus*, Batsch.
4. A. (*Pleurotus*) *chioneus*, P.
5. A. (*Pleurotus*) *affixus*, B.
6. A. (*Collybia*) *radicatus*, Fr.
7. A. (*Collybia*) *xanthopus*, Fr., vel. prox.
8. A. (*Collybia*) *raphanipes* v. *glaucophyllus*. [303]
9. A. (*Collybia*), sp. uncertain.
10. A. (*Mycena*) *lacteus*, Fr.
11. A. (*Mycena*) *galericulatus*, Fr.
12. A. (*Mycena*), perhaps *polygrammus*, Fr.
13. A. (*Mycena*) *corticola*, Fr.
14. A. (*Mycena*) *capillaris*, Fr.
15. A. (perhaps *Mycena*), uncertain.

213 WC: The numbers in this paper attached to genera are those of
“The Handbook New Zealand Flora.”

16. A. (*Omphalia*) *epichysium*, P.
17. A. (*Leucospori*), insufficient.
18. A. (*Pluteus*) *umbrosus*, P. (?)
19. A. (*Claudopus*) *variabilis*, Fr.
20. A. (*Pholiota*) *proæcox*, Fr.
21. A. (perhaps *Pholiota heteroclitus*, Fr.)
22. A. (*Pholiota*), sp., destroyed by insects.
23. A. (*Flammula*) *penetrans*, Fr.
24. A. (*Flammula*) *fusus*, Batsch.
25. A. (*Crepidotus*) *alveolus*, Fr., vel prox.
26. A. (*Crepidotus*) *pezizoides*, Fr.
27. A. (*Naucoria*) *vervacti*, Fr.
28. A. (*Naucoria*) *pediades*, Fr.
29. A. (*Naucoria*) *erinaceus*, Fr.
30. A. (*Naucoria*) *cerodes*, Fr.
31. A. (*Tubaria*) *inquilinus*, Fr.

Genus 2. Coprinus, Persoon.

1. *C. ephemerus*, Fr.
2. *C. plicatilis*, Fr.

Genus 4. Marasmius, Fries.

1. *M. fœtidus*, Fr.
2. *M. ramealis*, Fr.
3. *M. androsaceus*, Fr.

Genus 5. Lentinus, Fries.

1. *L. pygmæus*, Fr.

Genus 7. Panus, Fries.

1. *P. viscidulus*, B. & Br. (?)

Genus 9. Lenzites, Fries.

1. *L. betulina*, Fr.

Genus 10. Polyporus, Fries.

1. *P. lentinus*, B.
2. *P. (Mel.) picipes*, Fr.
3. *P. (Pet.) petalooides*, Fr.

Genus 12. Favolus, Fries.

1. *F. hispidulus*, B. & C., var. [304]

Genus 13. Hydnum, Linn.

1. *H. farinaceum*, Fr.
2. *H. mucidum*, Fr.
3. *H. (Res) membranaceum*, Bull.
4. *H. (Res) tabacinum*, Cooke.

Genus 16. Stereum, Fries.

1. *S. sanguinolentum*, Fr.
2. *S. acerinum*, Fr.
3. *S. ferrugineum*, Fr.
4. *S. frustulosum*, Fr.
5. *S. illudens*, B.

Genus 17. Corticeum, Fries.

1. *C. calceum*, Fr.
2. *C. cretaceum*, Fr.
3. *C. viscosum*, Fr.
4. *C. ochroleucum*, Fr., var. *spumeum*, B. & C.

Genus 20. Clavaria, Linn.

1. *C. mucida*, Fr.
2. *C. flava*, Fr. (distorted.)
3. *C. muscigena*, Karst.

Genus 30. Lycoperdon, Tournefort.

1. *L. echinatum*, P.
2. *L. echinellum*, B. & Br.
3. *L. tephrum*, B. & Br.

Genus 35. Stemonitis, Gleditsch.

1. *L. fusca*, Roth.

Genus 39. Phoma, Fries.

1. *P. malorum*, Berk.

Genus 48. Uromyces, Léveillé.

1. *U. amygdale*, Pers.

Genus 49. Ustilago, Link.

1. *U. olivacea*, Tul.

2. *U. urceolorum*, Tul.

Genus 50. Æcidium, Persoon.

1. *Æ. clematidis*, D.C.

Genus 59. Geoglossum, Persoon.

1. *G. berteroii*, Mont. [305]

Genus 60. Peziza, Dillenius.

1. *P. (Moll.) cinerea*, Batsch.

2. *P. (Scutellinia) badioberbis*, B.

3. *P.* sp. (imperfect).

Genus 65. Asterina, Léveillé.

1. *A. bullata*, Berk.

2. *A. reptans*, B. & C.

3. *A. (pelliculosa?)*

4. *A.*, sp.

Genus 68. Hypoorea, Fries.

1. *H. saccharina*, B. & C.

Genus 70. Hypoxylon, Bulliard.

1. *H. multiforme*, Fr.

2. *H. serpens*, Fr.

Genus 73. Nectria, Fries.

1. *N. episphaeria*, Tode.

Genus 74. Sphæria, Haller.

1. *S. acanthostroma*, Mont. ?

Genus 77. Erysiphe, Hedwig.

1. *E. (Martii ?) conidia*.

**** Of genera new to New Zealand.****Phlebia, Fries.**

1. *P. reflexa*, B.
2. *P. merismoides*, Fr.

Grandinia, Fr.

1. *G. granulosa*, Fr.
2. *G. granulosa*, v. *candida*.
3. *G.*, sp. (perhaps new, but insufficient for description.)

Odontia, Fries.

1. *O. scopinella*, B.

Kneiffia, Fries.

1. *K. setigera*, Fr., var.
2. *K. subtilis*, B. & C.

Hymenochæte, Fries.

1. *H. rubiginosa*, Lév.
2. *H. rhabarbarina*, B. & Br. [306]

Solenia, Pers.

1. *S. anomala*, P.

Calocera, Fries.

1. *C. viscosa*, Fr.

2. *C. cornea*, Fr.

3. *C. furcata*, Fr.

Tremella, Fries.

1. *T. lutescens*, Fr., v. *alba*, B.

Exidia, Fries.

1. *E. glandulosa*, Fr.

Næmatelia, Fries.

1. *N. nucleata*, Fr.

Dacrymyces, Nees.

1. *D. chrysocomus*, Tul.

2. *D. deliquescens*, Fr.

Lycogala, Mich.

1. *L. epidendrum*, Fr.

Ptychogaster, Corda.

1. *P.* (sp. n., incomplete.)

Fuligo, Persoon.

1. *F. varians*, Somm.

Craterium, Trent.

1. *C. minutum*, Fr.

2. *C. vulgare*, —

Arcyria, Hill.

1. *A. punicea*, P.

Trichia, Hall.

1. *T. varia*, P.

Sphærobolus, Tode.

1. *S. stellatus*, Tode.

Phyllosticta, Pers.

1. *P.* sp. (young.)

Bactridium, Kze.

1. *B. magnum*, Cooke. [307]

Cystopus, D'By.

1. *C. candidus*, Str.

Trichobasis, Lev.

1. *T. oblongata*, B.

Microcera, Desm.

1. *M. coccophila*, Desm.

Botrytis, Mich.

1. *B. terrestris*, P.

Verticillium, Link.

1. *V. rexianum*, Sacc. ?

Polyactis, Link.

1. *P. vulgaris*, C.

Penicillium, Link.

1. *P. glaucum*, Link.

Monilia.

1. *M. carbonacea*, Cooke.

2. *S. geochroum*, Desm.

Mucor, Mich.

1. *M. stercoreus*, Grev.

Morchella, Dill.

1. *M. conica*.

Calloria.

1. *C. vinosa*, Fckl.

Helotium, Fries.

1. *H. lutescens*, Fr.
2. *H. citrinum*, B.
3. *H. pallescens*, Fr.
4. *H. phyllophillum*, Desm.
5. *H. aureum*, Fr., var.

Hypomyces, Tul.

1. *H. aurantius*, P.?

Nummularia, Tul.

1. *N. exutans*, Cooke. [308]

Phyllachora.

1. *P. sp.* (sterile).

Lasiosphaeria.

1. *L. ovina*, P.

Sphaerostilbe.

1. *S. gracilipes*, Tul. (?)

Rosselinia.

1. *R. mastoidea*, Sacc.

Rhizomorpha.

1. *R. subeorticalis*, Fr.

(As the proper serial classification of these *gen. nov.* to New Zealand is unknown to me (not being mentioned in any of my works on Fungi), they are placed here somewhat irregularly at the end of this section.)

Polystictus.

1. *P. pergamenus*, Fr. (junior.)
2. *P. versicolor*, Fr.
3. *P. tabacinus*, Mont.

Fomes.

1. *F. (Fom.) fomentarius*, Fr.
2. *F. (Lævi) hemitrephus*, B.
3. *F. australis*, Fr.
4. *F. (Res.) obliquus*, Fr.
5. *F.* sp. (young specimens only.)
6. *F.* sp. (resupinate state.)

Poria.

1. *P. vaporaria*, Fr.
2. *P. mollusca*, Fr.
3. *P. fusco-purpurea*, Fr.
4. *P. mucida*, P.
5. *P. ferruginea*, Fr.
6. *P. vincta*, B. et K.

Chrysosplenium.

1. *C. omnivirens*, B.

Lamproderma.

1. *L.* sp. (old.)

Daldinia.

1. *D. concentrica*, De Not.

Xylostroma.

1. *X.* sp. (incomplete.) [309]

Hamaspora.

1. *H. longissima*.

Dimerosporium.

1. *D. excelsum*, Cke.

Comatricha.

1. *C. typhoides*.

Hypoderma.

1. *H. ilicinum*, De Not.

2. *H. commune*, Fr.

SECTION II.—Species wholly new to science (sps. nov.) with a few remarks on each.

(Those genera that are also new to New Zealand and not found in the foregoing list (**) are marked with a star.)

1 *Agaricus (Naucoria) acutus*, Cooke.

A small species growing closely together within a rotten log.

2 *Cyphella filicola*, Cooke.

A highly curious little parasitical fungus, forming small whitish cups, growing thickly on *Hymenophyllum demissum*, on the marginal tips of its frond, somewhat resembling large valves or indusiums of *Lindsæa*; it is apparently scarce, only a very few fronds having been noticed. It has also been subsequently detected by Mr. H. Hill (1 spn.), thickets, east base of Ruahine Range; and by Mr. Hamilton.

3 **Leptothyrium panacis*, Cooke.

A small species, parasitical on leaves of *Panax arboreum*.

4 *Sphaerонema solanderi*, Cooke.

A small species, sparingly found on rotten branches.

5 **Septoria colensoi*, Cooke.

Parasitical on lining leaves of *Myoporum lœtum*; Napier.

6 *S. coprosmæ*, Cooke.

On dead leaves of *Coprosma lucida*.

7 **Coleosporium compositarum*, Lev.; var. *oleariæ*.

On heads of flowers and peduncles of *Olearia colorata*, growing profusely; but not commonly observed.

8 *Æcidium hypericorum*.

On leaves of *Hypericum japonicum*, forming small bright-yellow spots. [310]

9. *Uromyces microtidis*, Cooke.

On leaves of *Microtis porrifolia*.

10. *Helotium sordidum*, Phil.

Small stipitate fungus, heads circular, 2 lines diameter, of a light-drab colour; on the underside of rotten logs.

11. *H. pseudociliatum*, Phil.

A small species, with a white centre above, red below and at margin; margins ciliate; on rotten wood.

12. *Patellaria torulispera*, Cooke.

On bark of a dead tree: small species.

13. *Rosellinia (Comochæta) colensoi*, Cooke.

A curious small hairy fungus, with a black tip; found very sparingly nestling on dead wood.

14. *Xylaria pallida*, Cooke.

A curious elongated species, resembling others of this genus; only once met with on a dead log, but in profusion there.

15. **Sphœrella weinmannia*, Cooke.

Parasitical on leaves of *Weinmannia, racemosa*.

16. *S. aristoteliæ*, Cooke.

On living leaves of *Aristotelia racemosa*.

17. *S. (Sphaerulina) assurgens*, Cooke.

A curious little species, forming minute black spots on fronds of living *Trichomanes venosum*.

18. **Berggrenia aurantiaca*, Cooke; var. *cyclospora*.

A small bright-red sessile fungus, found sparingly, and always singly, on the ground in forests; and almost invariably gnawed by insects.

Here I would place two other new, but little known, indigenous species—*Polyporus nivicolor*, Col., and *Nectria otagensis*, Curr., from the same parcel with the foregoing; although both have been already described: the first one in “Trans. N.Z. Inst.,” vol. xvi., p. 361; and the second in a paper by Dr. Lindsay, published at Home. I now insert these two Fungi here—the *Polyporus*, because of it being now confirmed by Dr. Cooke, and the *Nectria*, because of it being also found here in the North Island; of this fungus there were three packets sent, in various stages. (Its *specific* name is another witness to the impropriety of giving such local habitats as a name for a species.) [311]

ALGÆ.

Of the small terrestrial Algæ sent in that parcel only two species were determined, and both of genera hitherto unknown in New Zealand, viz.:—

1. *Phormidium*, or *Chthonoblastes*, sp.

A peculiar-looking plant, found overrunning gregarious and short mosses growing in patches, in rather long lines which are nearly straight, both brown and black, having a ribbon-like appearance; scarcely visible to the naked eye when dry, but very plain when wet, especially after much rain.

2. *Dritosiphon muscicola*, Kutz.

A pretty little blue hairy erect moss-like plant, found in retired holes and clefts in the cliffy banks, among grass and herbage; Scinde Island, Napier.

Total number of additional species of genera known to inhabit New Zealand	82	Two striking facts will here
Total number of species of genera hitherto unknown in New Zealand	77	
Total number of indigenous <i>species novæ</i> , some also belonging to genera not before known to exist in New Zealand	18	
Also two additional species novæ of terrestrial Algae	2	
Total number of species new to our N.Z. Flora	179	

immediately arrest our attention, (the same, too, as were quite as noticeable on the former occasion above mentioned), viz.:—

1. The large number of Fungi here in New Zealand that are identical as to both genera and species with those of

England and other western countries, a few of them being almost cosmopolite.

2. The small number of truly indigenous species novæ.

And that those Fungi that are at present undiscovered will still continue to be found bearing pretty nearly the same ratio I have little doubt.

Another fact worthy of notice is the large number of genera not hitherto known to inhabit New Zealand. From the preceding list it appears there are no less than 58 genera new to this country, many of them at present possessing but a single species; yet, as several of those genera contain a large number of species in other lands, it is but reasonable to suppose that the number of each will be largely augmented here. [312]

If time permitted I should like to make some distinct observations, illustrating several of those new genera, for they are very heterogenous, and widely differing in appearance and in substance in all manner of ways; such, however, are the usual and common features of this vast order.

Those new species vary in shape, in size, in colour, and in substance, in hardness and in softness, in durability and in fugacity, in toughness and in brittleness. Some possess striking, brilliant, and beautifully varied colours, of which a bright-red not unfrequently predominates: others are elegantly zoned, and plaited, and frilled with varying neutral colours regularly disposed; of such are *Polyporus versicolor*, and *Stereum lobatum*; some have a rich lustrous satiny appearance, others are velvety, while others are opalescent, as *Poria vincta*; some are black, as

Daldinia concentrica and *Antennaria* sps.; while others, as *Polyporus nivicolor*, *Fomes hemitrophus*, and *Calicium ochrolaceum* var. *spumeum*, are of the purest white, which delicate virgin unsullied appearance, unfortunately, they often lose in the most careful drying; some are of enormous size and aberrant forms (as *Fomes* sps.), 2–3 feet long and proportionately thick, and no two specimens of the same species alike in shape; while others are very regular, like little round black shining beads, as *Comatricha typhoides*; or minute cup-shaped flowers clustered together, as *Æcidium clematidis*; or miniature birds' nests with eggs, as *Cyathus*, and *Crucibulum* sps.; some are very hard, and also perennial, so that an axe makes but small impression on them; while others are very soft and, indeed, ephemeral, dissolving of their own accord in a few hours from their first sprouting into a watery mass! One or two species (notably *Fuligo varians*) resemble, when fresh, a light custard pudding, which, with careful drying, turns to dust! while others, as *Tremella lutescens* var. *alba*, assume the appearance of a delicate branching *blomange*, which, curiously enough, when carefully dried, leaves no visible residuum, save a dull shining mark on white paper as if a slug or a snail had sojourned there. Some are cancellated, hollow and light, like fine net or lattice-work; others are solid and heavy; some take the appearance of old worn chamois-leather (as *Xylostroma* sp.; some are very tough, so that they are gathered from their matrix, or substance to which they adhere, with extreme difficulty; others are so fragile, and withal permanent, as only to be found in perfection where neither winds nor rains can reach them, and though sometimes resupinate and several inches

long, can scarcely be laid hold of, or removed, with the most cautious and tender handling. For such fairy- or gossamer-like productions I usually carry a little tin box lined with silver- or blotting-paper, and so manage to cut them down and drop them into it without touching them; but even this delicate treatment is too coarse for some (*Stemonitis* sps.), which, [313] pretty though they are in their recluse place of growth, the very slight movement of the air in putting forth one's hand towards them is often sufficient to break them up into a cloud of spores!

Three, however, of the newly detected indigenous species I should not fail to bring to your notice, if only for the peculiar matrices on which they respectively grow, two of them being only found on our delicate and elegant living ferns, *Trichomanes venosum*, and *Hymenophyllum demissum*. On the former of those two ferns, *Sphaerella (Sphaerulina) assurgens* is sparingly found; to the naked eye it is a minute round and slightly elevated black spot with a very small outside. The larger and far more curious species, *Cyphella filicina*, inhabits the latter fern, covering the tips of its fronds with its whitish cup-like receptacles, presenting a neat appearance somewhat resembling the indusiae of a *Lindsæa*. This pretty and scarce fungus has also been found by Mr. Hill, and by Mr. Hamilton, in different localities, and only one specimen by each. Both of those fungi are scarce and rarely met with. The third, a very minute and almost microscopic species, *Monilia carbonacea*, is only found on the surface of burnt black and dry logs, giving them a very peculiar appearance. In form it resembles a minute and regular necklace of beads (whence, also, its name). It is far from being easily gathered.

In conclusion, I would briefly refer to another small and delicate species among those in the first list, *Mucor stercoreus*, a very common fungus at Home; but this is the first time of its being found here, or any of its sub-order. Of the non-detection of this genus (which is a large one) in these parts, Berkely wrote, saying: "No species of *Mucor* appears in the floras of the Antarctic regions and New Zealand, but I do not doubt their existence there, though none appears to have been collected by Bertero, who was a very close observer, in Juan Fernandez."²¹⁴ And Sir J.D. Hooker, writing in the "Handbook Flora of New Zealand" on the sub-order *Physomycetes*, to which this genus belongs, makes a similar observation: "To this tribe belong the true moulds (*Mucor*, etc.), of which species must occur abundantly in New Zealand, though they have never been collected." (p. 600.)

214 WC: "Cryptogamic Botany," p. 294.

**1887 A description of a new species of
Coccinella found in New Zealand. *Transactions
of the New Zealand Institute* 20: 40-42.**

[*Read before the Hawke's Bay Philosophical Institute,
11th July, 1887.*]

CLASS INSECTA.

ORDER IV. COLEOPTERA.

Tribe CLAVIPALPI.

Section TRIMERA.

Group Coccinellidæ, Latreille.

Genus Coccinella, Linn.

C. novæ-zealandiæ, sp. nov.

Sub-hemispherical, moderately gibbous, 2½ lines long. *Body, head, and legs black; elytra light vermillion, spotted with black. Head (and prothorax) intensely black, glossy, sub-iridescent, with two deltoid-shaped white spots between the eyes, and two minute ones below eyes at their inner angles; maxillary palpi terminal joint very large, broad, and flat; labrum with a few fine short ciliæ-like hairs; antennæ; tips broadly cuneate, flattish.*

Prothorax with a large pentangular (escutcheon-shape) white spot on each anterior angle of pronotum. Elytra, margins considerably dilated and of a brighter red, with 11 sub-orbicular spots, disposed regularly in two rows longitudinally and three rows laterally, the upper spot on sutures near base over scutellum being the largest, with a white patch at base above; the four central large and the six outer small; their edges very irregular and ragged; a

circular light-red spot in the middle of each elytron, margin entire; and two obscure longitudinal veins; the whole finely powdered with excessively minute black specks, which are more thick near the sutures. *Hind-wings* rather large, dusky, mostly so about costal and sub-costal veins, with an opaque dull-reddish line on costal edge from base to near second costal cell, where it forms a squarish-oblong blotch, or kind of ptero-stigma; the sub-median vein strong and clearly marked. *Metasternum* white. *Abdomen* very finely and minutely hairy, with a white spot beneath at each anterior angle; tip of anal portion hairy; hairs patent. *Legs*, tarsi finely and closely hairy.

Hab. Napier; forests interior of Forty-mile Bush, Waipawa County, 1870–85; (also earlier at the north, Bay of Islands, etc.); but always singly and very rarely met with. Mr. Hamilton has lately (1886) captured a single specimen. [41]

Obs. Although I have long known this pretty little insect, I have never before thought of describing it: partly from the great number of species of this genus already known, which (without their equally numerous varieties), it is said, amount to upwards of a thousand,²¹⁵ partly from it so closely resembling (in its general appearance) some of our British species; and partly from its extreme rarity. I

215 WC: "The species are difficult to discriminate, and number upwards of a thousand." ("Guide to the Study of Insects," Packard, p. 511.) "These insects are among the most variable and difficult, as to their specific discrimination, of all the Coleoptera." ("Introduction to the Classification of Insects," Westwood, vol. i., p. 396.)

do not think I have seen, altogether, a dozen specimens in 50 years!—in this respect so widely different to what obtains of some of their commoner (yet similar) species in England. Indeed, I may truly say that the capture or sight of one of these interesting little and rare creatures—so very like the tiny “Ladybirds” of England in size, shape, colour, and spots—always served to conjure up pleasant old reminiscences of childhood, and of the old childish couplet, potently repeated in days of infancy over the pretty “Ladybirds” when caught, and watching them taking flight from one’s hand:—

“Ladybird, Ladybird, fly away home;
Your house is on fire, your children are gone!”

The under-wings of this species seem to me to be much larger than those of the British species of a similar size of body; and I think this species is therefore a better flyer, more active and vigilant, and consequently more rarely at rest and difficult of capture: if, as I have supposed, its wings be larger, it may keep at a higher range on trees and shrubs in search for its natural food.

I have kept one a fortnight under glass, during which time it was in ceaseless activity, and as I did not procure for it its natural or suitable food, it fasted the whole of that period, and was as lively at the close (when I put it into spirits) as at the beginning. While in captivity, I noticed a peculiarity it had: on being irritated, or alarmed, it would exude many minute drops or specks of a yellowish, sticky, semi-fluid substance on to the sides of the glass in which I kept it. I now find that this peculiarity had also been long ago observed in the Northern Hemisphere species. Westwood says: “When

alarmed, they fold up their legs and emit a mucilaginous yellow fluid from the joints of the limbs, having a very powerful and disagreeable scent, and which, according to some writers, is an admirable specific against tooth-ache" (*loc. cit.*). I did not, however, notice the powerful odour mentioned by Westwood.

Although this genus is an old established and very large one, many of its species being almost cosmopolite, and the [42] numbers of some of them innumerable, the genus is but poorly represented in New Zealand. Down to the present time only one species, *C. tasmani*, White, has been published as belonging to this Colony, and that species was detected at least forty-five years ago;²¹⁶ and, judging from its specific name, I should infer that it is not endemic but is also Tasmanian, where (at Hobart Town) those ships also stayed a long time during the preceding winter. I have also detected *C. tasmani* here in Napier, upon the leaves of the "Ngaio" tree (*Myoporum laetum*); but, like the others, only very rarely; it is a smaller insect, a little more gibbous, and black with yellow spots. In so saying I should also observe that this species, which I believe to be *C. tasmani* from its pretty closely agreeing with the description of it given by White (and recently copied by Captain Broun in his "Manual of N.Z. Coleoptera"), differs in at least one character, *i.e.*, the two spots between its eyes are *white* and not "yellow."

216 WC: "Zoology: *Voyage 'Erebus' and 'Terror,' Antarctic Expedition.*" As those ships only wintered here in our waters in 1841, and as this genus is mainly to be met with in the summer; and as I had given to the Expedition a large collection of insects (in spirits), it is not unlikely that that species was among them.

Moreover, I am aware of another species (*C. concinna*) said to have been found in New Zealand, the name only being given by Captain Broun ("Manual of Coleoptera," p. 645,) on the authority of Mr. Pascoe ("Ann. Mag. Nat. Hist.," Sept., 1875); of which species Captain Broun also says: "I know nothing of the insect by literature or otherwise." This may, however, prove to be identical with this newly described one of mine.

In conclusion, Captain Broun having mentioned Mr. Pascoe's name, I may also add a few words respecting him—one of our early scientific naturalist visitors. I knew Mr. Pascoe well, both as schoolboys together and denizens of the same native town, and, also, in later years, when he was here in New Zealand as surgeon of one of H.M. ships, before the formation of the colony. At that early time Mr. Pascoe made valuable collections in New Zealand natural history, especially of birds and insects. From him I received my first complete (MSS.) list of the avifauna of New Zealand, kindly compiled by himself for me. He particularly excelled in the skinning and preparing the smaller birds, an art he had early acquired at Home. The bare mention of this—our indigenous birds—leads me on further to observe, How very different our native woods and forests are now with respect to their former inhabitants, once so very numerous! now so very scarce, and of some kinds all but extinct!

**1887 On new phænogamic plants of
New Zealand.²¹⁷**

Transactions of the New Zealand Institute 20: 188-
211.

[Read before the Hawke's Bay Philosophical Institute,
12th September, 1887.]

Class I.—DICOTYLEDONS.

ORDER I.²¹⁸—RANUNCULACEÆ.

Genus 3. Ranunculus, Linn.

1. *R. reticulatus*,²¹⁹ sp. nov.

Plant a dwarf tufted perennial, 2–3 inches high. Root-stock thick, 1 inch long, $\frac{1}{2}$ inch diameter, composed of many old and loose coalescent petioles; roots several, long, stout, spreading. Leaves few, all radical, erect, spreading, thickish, light-yellowish-brown or tawny-yellow and glabrous on the upper surface, yellow beneath with long silky scattered white hairs, orbicular-reniform, $1\frac{1}{4}$ – $1\frac{1}{2}$ inches broad, 8–9 lines long, petiolate, basal sinus very large, 3-parted; segments flabelliform, spreading, cut to base, $\frac{3}{4}$ –1 inch wide at top, very narrow (sub 1 line) at base; sinuses very large and open; each segment sub 3–4-lobed; lobes deeply cut ($\frac{1}{3}$), outer

217 WC: Mounted specimens of the plants herein described were exhibited at the meeting.

218 WC: The numbers attached to the orders and genera in this paper are those of them in the "Handbook, Flora of New Zealand."

219 *Ranunculus nivicola* Hook.f.

margins coarsely crenate-serrate; teeth very obtuse; veins yellowish-brown, sunk, obscure, rather distant, anastomosing; veinlets dark-brown, numerous, largely reticulate, compoundly anastomosing throughout the whole leaf, extending into the smallest teeth. Petioles 1– $1\frac{1}{4}$ inches long, stoutish, channelled above, coarsely striate, very hairy; hairs long, white, patent; largely dilated at base into a kind of loosely sheathing glabrous stipule, auricled upwards, margins very membranous.

Hab. Sides of Mount Ngaruahoe, “altitude 3,000 feet,” County of East Taupo; 1887: *Mr. H. Hill* (“apparently scarce”).

Obs. I. A peculiar (and, as far as I know, a unique) species, differing widely from all its congeners; perhaps its nearest ally is *R. pinguis*, Hook, f., which is said in “Handbook Flora N.Z.” to have “veins reticulated;” (though such is not stated in the very long and minute description of that species given in “Flora Antarctica,” vol. 1., p. 3; neither is any such character shown in the large plate containing several specimens of that plant with dissections in the accompanying drawing in that work;) but this plant is also widely different from *R. pinguis* in several other characters. Its main veins are irregular with copious areolæ between them with free clavate veinlets, somewhat like what obtains in the venation of *Polypodium billardieri*. [189]

II. Of this plant I have received three entire specimens, in leaf only, but evidently mature and old from their thick root-stocks; one (the largest) has 3, one 4, and one (the smallest plant) 6 leaves; the plants are pretty nearly alike. Unfortunately I have not seen any flowers or fruit, nor

any old vestiges of the same; but the peculiar shaped and striking reticulated leaves have induced me to describe it and make it known.

ORDER IV.—VIOLARIEÆ.

Genus 2. *Melicytus*, Forst.

1. *M. microphyllus*,²²⁰ sp. nov.

Female.—Free, small, and slender, much like the male plant described,²²¹ trunk bare, erect, once forked at 6 feet from the ground; young branchlets very long and slender, almost filiform, dark purple, finely puberulous. Leaves few and scattered, as in male plant, but smaller, usually 2–3 (rarely 4) lines long, base sub-truncate; petioles 1–1½ lines long. Flowers rather numerous, scattered, small, scarcely 1 line diameter, axillary and lateral, solitary, sometimes 2 (very rarely 3) together; peduncles short, about 1 line long, puberulous and bibracteate; bracts deltoid, brown, scarious, laciniate, with several similar stipellæ at base. Calyx persistent, dark purple, thickish; lobes 5, broadly oblong, with produced membranous brown laciniate-fringed tips; petals 5, sub-orbicular-oblong, white, with a delicate greenish tinge, sometimes purple-streaked, margins thickened and incurved, tips finely laciniate-ciliate, recurved; anthers 5, sessile, small, alternate with petals, sub-orbicular, with 2 minute erect horns at tip of connective, and a fleshy scale at back;

220 Possibly *Melicytus micranthus* Hook.f. var. *microphyllus*
(Colenso) Cheeseman.

221 WC: "Trans. N.Z. Inst.," vol. xix., p. 260.

style short, thick; stigma large, depressed, spreading, somewhat irregular, papillose or sub-rugulose, usually with 3 acute angles, their tips brown and incurved; ovary large, oblong, sub-cylindrical. Berry 2½ lines long, 1½ lines broad, oblong-ovoid, obtuse, dark-purple, smooth, a little fleshy; stigma and calyx persistent. Seeds 2, ovoid, 1½ lines long, largely gibbous on one side, the other flat, glossy, purple-spotted, one edge raised and thickened, tip a little incurved, sub-acute.

Hab. On the banks of a small stream in a forest south of Danneverke, County of Waipawa; February, 1887: W.C. (But only one tree seen; bearing ripe fruit, in May.)

Obs. The discovery of this plant pleased me much, as it served to confirm the validity of the species. In my description of the male plant (in vol. xix.), I had mentioned it being very near to *M. micranthus*, Hook, f., though with larger flowers and smaller leaves, etc.; the female plant, however, differs more largely and materially, particularly in the peculiar shape of its [190] stigma, and in its much larger and differently shaped berry. I was too early for mature fruit in February, for while there were plenty of flowers, only a very few young berries were detected. Ripe fruit, however, were obtained early in May from the same tree; which, though adhering firmly, and not beginning to shrivel, were but few in number, and much scattered; only in one instance did I detect two growing together.

ORDER XXVII.—HALORAGEÆ.

Genus 4. Callitrichæ, Linn.

1. *C. microphylla*,²² sp. nov.

Plant prostrate, tender, delicate, light-green. Stems very slender, 6–12 inches long, branched, rooting at nodes. Leaves opposite rhomboidal, $\frac{1}{2}$ – $1\frac{1}{2}$ lines long, usually broader than long, obtuse with a slight point, the larger and upper leaves with a single tooth at lateral angle (sub-ivy-leaf-shaped); veins 3–5 (tri-sub-quintupli-nerved), but returning circularly to midrib and not running to tip; petioles length of leaves. Flowers: Male and female together in axil, solitary; peduncle very short, bracts 0.

Male: stamen short, much shorter than fruit; anther minute, sub-trilobed, brown, *Female*: style short; stigmas 2, short, obtuse. Fruit rather large, light-brown, obcordate, emarginate, sinus deep, base truncate, double-winged all round margins; wings crisped, shining, very membranous, whitish; style persistent; seeds narrow, oblong, turgid.

Hab. On the ground in forests, forming thickish beds; and also in watercourses, in open lands near Danneverke, County of Waipawa; 1887: W.C.

Obs. I. This plant appears to be very distinct from the known published New Zealand species of this very small genus, (*C. verna*, Linn., and *C. verna*, β , Linn., or *C. stagnalis*, Scopoli,) also from those other British and European species, *C. pedunculata*, and *C. autumnalis*, which, with one other North American species, *C. terrestris*, compose the genus. From Sir J.D. Hooker's remarks on *C. verna* and its varieties, as severally and exhaustively given by him in his "Botany, Antarctic

Voyage,"²²³ this plant, as a species, seems to be wholly separate. I know it is from *C. verna* and its var. β , as found here in New Zealand, as I myself had early collected and sent specimens of those plants to Kew.

II. All the described species and varieties of *Callitrichæ* have their two stigmas very long acuminate and acute,²²⁴ without a [191] style, and the stamen much longer;²²⁵ but in this plant the opposite is the case, besides its minute, very peculiar, and angled upper leaves, with their different venation.

III. I may further observe that the finer specimens of this plant I found growing on the land in the woods, and not in watery places or in water; and when found in water the tips of the upper branches did not possess that crowded sub-rosulate appearance which is so common with *C. verna*.

ORDER. XXXIII.—UMBELLIFERÆ.

Genus 1. *Hydrocotyle*, Linn.

1. *H. echinella*,²²⁶ sp. nov.

Plant rather small, 5–6 inches long, procumbent, straggling, weak, branched; stems (and peduncles)

223 WC: Vol. i., p. 11; vol. ii., p. 272; vol. iii., p. 64; and vol. v., p. 124.

224 WC: "Half-inch long and upwards;" *teste* Hooker, *I.c.*, vol. i., p. 12.

225 WC: "Stigmas 2, long, filiform;" *I.c.*, vol. iii., p. 64.

226 Possibly a var. of *H. elongata* A. Cunn.

compressed flat; the whole plant hairy; hairs on stems curved, hyaline, sub-jointed: on leaves, strigose, thick, white. Leaves few, distant, scattered, orbicular, $\frac{1}{2}$ inch diameter, with a large spreading basal sinus, sub-membranaceous, dark-green, 4–6-parted; nerves 6, segments broadly obovate-cuneate, cut half-way to base, their sinuses open, rounded, margined; each segment sub-3-lobed; lobes 3–4-toothed; teeth acute, mucronulate. Petioles 1– $1\frac{1}{4}$ inches, slender, filiform, flexuous. Stipules small, sub-orbicular, membranous, nerved, laciniate-toothed; teeth erect, acute, and mucronate. Peduncles very much longer than leaves, very slender, flexuous, weak, 3 inches long; pedicels sub-20, $1\frac{1}{2}$ lines long, slender, patent. Involucral leaves many, small, narrow lanceolate, mucronate. Fruit small, orbicular, sub $\frac{1}{2}$ line diameter, turgid, slightly cordate at base, brownish, densely echinate; carpels with one prominent rib on each face, their back-edge obtuse and partly concealed with the echinate hairs; styles long, divergent.

Hab. Among herbage, woody glen, base of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. I. This little species differs considerably from all its known New Zealand congeners (and from all others known to me); the great length of its filiform peduncles and their being (together with the stems) compressed flat, and its densely echinated fruit, are peculiar and conspicuous characters, as also its leaves and stipules, in their many sharply acute mucronate teeth, and the margined sinuses of the leaves.

II. Unfortunately I have had but *one* imperfect specimen without flowers, and that not in very good condition, to

examine; and I should not care to describe the plant were it not for its striking characters. [192]

ORDER XXXIV.—ARALIACEÆ.

Genus 2. *Panax*, Linn.

1. *P. integrifolia*,²²⁷ sp. nov.

A small glabrous straggling shrub. 5–6 feet high, with a close rounded top. Branches (specimens) straight, stoutish, 4–5 inches long, scarred below, much branched and bushy at top; branchlets small and slender, close, bark black. Leaves very numerous, crowded, oblong-lanceolate and narrow obovate-lanceolate, tapering, $\frac{3}{4}$ –1½ inches long, but usually about 1 inch or less, jointed, petiolate, tips sub-acute, recurved, mucronulate, thickened; sub-membranaceous inclining to coriaceous, green, paler and longitudinally wrinkled on lower surface, glabrous but not glossy, midrib and veins obscure, margins entire, sometimes (but rarely) a leaf is slightly serrulate with 1–2 very small teeth near apex, a few leaves bifoliolate and also trifoliolate, and when so the leaflets are sessile, divergent, and entire; petioles slender, mostly $\frac{1}{2}$ – $\frac{3}{4}$ inch, longer when the leaf is compound. Stipules 0, but small subulate acute stipellæ at bases. Umbels simple, terminal and axillary, on erect peduncles 1 inch long, about 14-flowered; rays $\frac{1}{4}$ inch, patent, bibracteolate about middle; bracteoles deltoid, scarious, very small; 2 bracts at base thick, obtuse; involucral leaves very small sub-linear. Fruit sub-

227 Not found.

orbicular, broader than long, 2 lines diameter, compressed, dark olive, glossy, coriaceous, sunk and corrugated transversely between carpels; calycine teeth stoutish, acute, recurved; styles 2, recurved, divergent.

Hab. Base of Mount Ruapehu, County of East Taupo; “altitude 5,400 feet;” 1887: *Mr. H. Hill.*

Obs. I have received several specimens of this plant, but all past flowering. It does not appear to be closely allied to any of our New Zealand (and South Pacific) species; perhaps it approaches more nearly in a general way to *P. simplex*, Forst., and to *P. sinclairii*, Hook.f.

ORDER XXXVIII.—RUBIACEÆ.

Genus 3. *Galium*, Linn.

1. *G. triloba*,²²⁸ sp. nov.

Plant prostrate, light green. Stems many, 2–3 feet (or more) long, slender, weak, scaberulous, channelled, tetragonal, angles sharp or slightly sub-winged. Leaves few and scattered, distant in whorls of 4 on the main stem (sometimes 3, and on ultimate branches only 2, and very small), linear-lanceolate, $\frac{1}{2}$ inch long, 3-nerved, scaberulous on margins and midrib, tips acute and obtuse. Flowers very minute, in long open lax axillary panicles, 3–6 inches long, bearing filiform sub-panicles [193] (or peduncles) 1–2 inches long, of 3 (rarely 4) fasciculated pedicels, each sub $\frac{1}{2}$ inch long, with two small opposite bract-like leaves at their base; corolla

228 *Galium tenuicaule* A.Cunn.

cream-coloured, trilobed; lobes broadly-ovate or deltoid-rotund; tips sub-acute, their upper margins slightly fringed tubercular, with a strong central nerve, and a coloured intra-marginal nerve-like line. Fruit sub-globose, minutely papillose (*sub lente*), dark-coloured, nearly black.

Hab. Edges of streamlets in dense shaded woods near Danneverke, County of Waipawa; 1887: W.C.

Obs. This species is rather peculiar from its very small trilobed corolla with tuberculate margins, and its thickly entangled habit of growth, forming thick beds. It may, however, prove to be a southern variety of A. Cunningham's northern New Zealand species, *G. tenuicaule*; of which only an imperfect description (omitting its flowers) is given by him in his "Prodromus;" while Hooker f., in his "Handbook," merely says in addition, of the corolla of that species: "Flowers white, $\frac{1}{12}$ th inch diameter."

ORDER XXXIX.—COMPOSITÆ.

Genus 1. Olearia, Mœuch.

1. *O. xanthophylla*,²²⁹ sp. nov.

A small, low, diffuse, much-branched shrub, "1 foot 6 inches high," branchlets erect, 2–4 inches long, simple, rather slender, glabrous, yellow (as are the leaves beneath) with dry gummy exudation. Leaves numerous, small, closely imbricated and adpressed, somewhat sub-decussately arranged, obovate-spathulate, 3 lines long, 1½ lines broad at widest, obtuse, coriaceous, entire,

229 *Ozothamnus leptophyllum* (G. Forst.) Breitw. & J.M. Ward.

glabrous with a few weak woolly hairs at tips; brownish on the upper surface, bright yellow (almost orange) on the lower and covered with a thick yellow scurf or gum very closely adhering, corrugated, the midrib stout; margined, the margin thick, dark-brown with a shining gummy appearance; petioles thick, dilated and rugulose at base. Flowers terminal at tips of branches, in thick globular compact corymbs, $\frac{1}{2}$ – $\frac{3}{4}$ inch diameter; heads small, obconical, 2 lines diameter, containing about 9 florets; peduncles 2 lines long, grooved, bi-bracteolate; bracteoles opposite, small, ovate, acute, spreading, woolly (as also pedicels); pedicels $\frac{1}{2}$ line long with 1 small bracteole at base of head; the outer involucral scales imbricate in 2 rows (inner row longest), pale yellowish-brown, sub-scarious, loosely silky, edges very membranous, tips obtuse and irregularly cut; the inner scales, tips pure white, much laciniate, recurved, their lateral margins serrulate, slightly and loosely woolly, base bifid. Pappus few, white, short, equal, a very little longer than florets, thickened and dilated at tips. Achene small, sub-cylindrical, slightly grooved, dilated at base, glabrous. [194]

Hab. High plains, Waimarino, west side of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

2. *O. hillii*,²³⁰ sp. nov.

A small stout erect glabrous bushy shrub, “12–18 inches high”; branches thick, many, the upper portions very leafy, the lower scarred; branchlets dark-coloured, grooved, shining, gummy. Leaves small, numerous,

230 *Olearia nummularifolia* (Hook.f.) Hook.f.

close, sub-adpressed and sub-imbricate, elliptic, elliptic-orbicular and obovate, 1½–3 lines long, entire, petiolate; tips rounded with a few loose scattered woolly, hairs, also about margins; the upper surface brown, reticulated and glossy; the lower pale primrose-colour, with dry gummy scurf, mid-rib very dark-coloured; margins thickened and recurved; petioles dark-coloured, channelled, shining, sub-½ line long, those of obovate leaves tapering, those of elliptic, etc., suddenly formed. Flowers sub-terminal in single axillary heads; peduncle slender, ½ line long; heads campanulate, sub-½ inch long, 3–4 lines broad, each containing about 7 florets; involucral scales in 4 rows, glabrous, shining, tipped and margined with dry gummy exudation; the inner longest, narrow, linear-lanceolate, 1-nerved, sub-acute; the outer broader and sub-ovate; margins and tips slightly hairy and ciliate. Pappus reddish-brown, long, spreading, equal, very slender below; tips thickened and much serrulate, somewhat bushy. Achene long, slender, sub-cylindrical, irregularly uneven, dark-brown with black nerves, glabrous, with a very few scattered white hairs near base, and sometimes forming a single broken longitudinal line.

Hab. High plains, Waimarino, west side of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

3. *O. rigida*,²³¹ sp. nov.

Shrub, “2 feet high,” diffuse with a rounded dome-like top; branches (specimens) 3–5 inches long, very stout (as thick as a common-size lead pencil), rigid, densely

231 *Senecio bidwillii* Hook.f..

clothed with closely-adpressed greyish wool. Leaves numerous, opposite, very thick and rigid, almost sub-woody, regularly elliptic, usually about 1 inch long, sometimes on same branchlet only $\frac{1}{2}$ or $\frac{1}{4}$ inch, often concave, abruptly joined to petiole, not narrowed or tapering, tips recurved; glabrous, glossy, reticulated and rugulose, dark-olive and greenish-brown on the upper surface; densely pilose on the lower with short closely-adpressed light-reddish-grey hairs; margins entire and much thickened, narrowly and regularly woolly on the upper rim; petioles long, 3–7 lines, varying, with the sizes of leaves, stout, channelled, and densely pilose, their bases very thick, dilated, clasping. Flowers terminal, corymbose at tips of branches; corymb subrotund, 1– $1\frac{1}{2}$ inches diameter, rather loosely branched in sub-panicles of 3 heads, the base closely surrounded with [195] leaves; heads small, turbinate, spreading, 3 lines diameter, containing sub 20 florets; pedicels 2 lines long, very, stout, woolly with a small bracteole; wool faint dingy yellowish-white with a tinge of red. Involucral scales in sub 2 series of 8 spreading scales, alike, very thick, rigid, oblong, very obtuse, concave deeply grooved, densely woolly without, glabrous within, tips and margins incurved. Pappus white, very short (length of achene), unequal, wavy, irregular, scabrous throughout and not thickened at tips. Achene rather long, $1\frac{1}{2}$ lines, slender, linear, curved, grooved, glabrous, striate, brown.

Hab. High plains, Waimarino, west side of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

Genus 13. **Raoulia**, Hook. fil.

1. *R. albo-sericea*,²³² sp. nov.

Plant perennial, small, prostrate, 8–10 inches long, spreading stems slender, leafy, woody, reddish-brown, rooting; roots very long and fibrous; much and irregularly branched; branchlets sub-ascending, 1–3 inches high, glabrous. Leaves numerous, close, not imbricate save at tips, opposite, sub-decussately arranged, close and ascending above on branchlets, distant and patent below, linear-spathulate or rotund, 1½–2 lines long including petiole, lamina spreading and folded (conduplicate), tips largely rounded, 1 line broad, pure white, silky, the glossy hairs closely adpressed, more so on the outside than on the inside (upper surface), where they only form a small semicircular spot at tip; petioles as long as lamina, adpressed, linear, very broad, glabrous, brown, 3-nerved, nerves dark. amplexicaul, their bases overlapping. Heads (few seen) single, terminal on lateral branchlets, small, half-concealed among the leaves. Involucral scales in 2 (sub 3) rows, glabrous, glossy, brownish, 1-nerved, lateral margins hyaline, largely dilated; the outer linear, tips much and deeply laciniate; the inner linear-spathulate, tips retuse and emarginate, slightly crenulately notched, recurved, florets few, sub 6–8. Pappus very few (sub 8 to achene), white, slender, upper part scaberulous, the lower slightly and distantly so, tips acute. Achene glabrous, minutely striate, olive-coloured, slightly tapering and angular, base a little produced and pointed.

Hab. On the dry lower slopes of Mount Ngaruahoe (Tongariro Range), "altitude 5,300 feet," County of East Taupo; 1887: *Messrs. Hill and Owen.*

Obs. I. This interesting little species belongs to Hooker's 1st subsection,²³³ and is pretty closely allied to two of his species there described—*R. australis* and *R. munroi* (but with more of the habit of a third species, *R. tenuicaulis*); it differs, however, [196] from them in habit and in dimensions, in the shape, size, colour, and silkiness of its leaves and involucral scales, and especially in the fewness of its pappus hairs.

II. Only three heads of florets were found on several specimens that were collected, and these were much advanced, with the florets of the one dissected gnawed by insects; the other parts of the head, however, were perfect.

ORDER XL.—STYLEDIEÆ.

Genus 1. *Forstera*, Linn.

1. *F. truncatella*,²³⁴ sp. nov.

Plant small, herbaceous; stem stout, erect, simple, 2½–4 inches long, red, succulent, ½–1½ inches of the basal portion bare of leaves and scarred, with many simple fibrous rootlets, the upper portion leafy. Leaves light-green, close-set, imbricating, sessile, 3 semi-amplexicaul, 3 lines long, obovate-oblong, thickish, obsoletely veined (seen when held up between eye and light), margins narrowly cartilaginous, a circular green pore at tip within

233 WC: "Handbook New Zealand Flora," p. 148.

234 Possibly *Forstera bidwillii* Hook.f. var. *densifolia* Mildbr.

margin upper surface, which becomes dark-brown in age. Scape 2 inches long, filiform, red, erect, 1–2-flowered; bracts, on 2-flowered specimens, 6–7, on 1-flowered specimens, 4–5, linear, truncate, 1-nerved, nerve strong, simple; tips ciliate. Calyx large, 4–5 lines long, 6-lobed; lobes oblong, suddenly acuminate, tips truncate, strongly nerved, nerve branched, branches diagonal, short, straight; margins glandular-ciliate. Corolla $\frac{1}{2}$ inch diameter, membranaceous, slightly waved, much veined; veins flexuous and branched; tube short; lamina 6-lobed, cut nearly to base; lobes oblong somewhat broader near apex, spreading, the upper half white, the lower reddish; tips rounded, sub-retuse; margins uneven, tubercular-ciliate. Style erect, divided at base; anthers and stigma exserted.

Hab. Banks of a small mountain stream on the west side of Mount Ngaruahoe; "altitude 5,200 feet;" County of East Taupo; 1887: *Mr. H. Hill.*

Obs. I. A species allied to those three New Zealand species already described, ("Flora New Zealand,") but differing from them all in several particulars; especially in its larger membranaceous flowers with glandular and tuberculate-ciliate margins to both corolla and calyx, which are also much veined, and in the tips of the calycine lobes, and of the bracts, being much truncate.

II. I have received but a few perfect specimens in flower of this interesting little plant, and as I have only dissected one flower (taken from a 2-flowered scape), my description is not so complete as I could wish it to be; it is, however, quite correct as far as it goes: there were just as many 2-flowered as 1-flowered scapes in the lot. [197]

Genus 4. *Oreostylidium*, Berggren.²³⁵

1. *O. affine*,²³⁶ sp. nov.

Plant very small, short, cæspitose, densely tufted, 1–1½ inches high, erect; stem 0; roots long, fibrous, from bases of leaves. Leaves radical ¾-inch long, ½ line wide, rather thickish, linear-subulate with a slender mucro, concave on one side, dilated at base, glabrous, margins entire, green, yellowish and sub-rigid in age. Scape slender, erect, ½ inch high, with a broad foliaceous bract about the middle, glandular-hairy (as also the calyx and ovary), hairs tipped with globular black heads. Flower single, at top of scape; calyx erect, stout, very broad (nearly as broad as ovary), margin irregularly lobed; lobes? 6. Corolla, etc., not seen. Ovary large (for plant), 1½ lines long, oblong, sub-cylindrical, tapering and jointed on to scape.

Hab. In swampy ground at west base of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. I. This plant resembles *Oreostylidium subulatum*, Berggren, as carefully drawn by him;²³⁷ (which is also

235 WC: *Oreostylidium*, gen. nov., Berggren. Of this he says: "A stylidio differt hoc genus corollæ laciniis conformibus, columna brevi erecta, stigmate latiore, capsula indehiscente." *Stylium*, proper, is a very large Australian genus, containing nearly 100 species.

236 *Oreostylidium subulatum* (Hook.f.) Berggr.

237 WC: In his carefully-executed work on some of our New Zealand plants, and mostly *species novæ* discovered by himself—which, unfortunately for me (for us?) is written mainly in the Swedish language—entitled, "Nagra nya," etc. And in mentioning this work here, I must not omit to thank Dr. Berggren for it, and

the “*Stylium? subulatum*, n. sp.,” of Hook.f., as given by him with doubt, from his imperfect specimens, in the “Handbook N.Z. Flora,” p. 168;) and it would be by me referred to that species were it not for its differential characters—viz., its long and bracteated scape, its broader calyx, with, probably, the larger number of its lobes, its differently-shaped ovary, and its mucronate leaves; none of which characters are given or mentioned by either Hooker or Berggren—in fact, they both give the opposite; and this plant has, also, no long proliferous runners as is shown in Berggren’s figure. Unfortunately, the few fruiting specimens I have (three together) were all defective in the margins of their calyces, as if gnawed by some insect, and there was a similar large hole in one of their ovaries, and no corollas; the other parts of the plants were perfect.

II. Curiously enough, Berggren gives “locis uliginosis ad montem Ruapehu,” as one of the places in New Zealand (and the only one in the North Island), where he had detected his little plant; and this place is very near the locality where Mr. Hill found his specimens. [198]

ORDER XLII.—ERICEÆ.

Genus 1. *Gaultheria*, Linn.

1. *G. divergens*,²³⁸ sp. nov.

particularly for its most elaborately and exhaustively prepared and beautifully executed plates of plants with their dissections.

238 *Gaultheria paniculata* B.L.Burtt and A.W.Hill.

Shrub "2 feet 6 inches high," erect, much branched; branches 6–8 inches long, slender; branchlets finely and sparsely pubescent, with scattered long rigid stout adpressed sub-spinous hairs, glabrous and shining; extending, also, on midrib of leaves below; the young branchlets with scattered long simple linear adpressed leaf-like bracteoles, which are fugacious. Leaves alternate, numerous, sub-erect, flat, oblong and broadly lanceolate, usually 8–9 lines long, sometimes (but rarely) only 3–4 lines, coriaceous, largely reticulated on both sides, the upper surface sub-rugulose, varnished, glossy, reddish-brown; margins thickened, finely serrate-mucronate; petioles short, stout, pilose, 1 line long. Flowers in simple terminal and sub-terminal loose axillary racemes, 2 inches long, distant, spreading; peduncles and pedicels pilose; pedicels slender, curved, 3 lines long, bibracteate as well as having bracts at their bases. Calyx much corrugated at base; lobes large spreading, cut nearly to base, narrow ovate-acuminate very acute, sub-membranaceous, 3-nerved, margins entire. Corolla not seen, past flowering. Capsule small, dry, erect (not depressed), sub-poculiform, 5-angled; style dark-red, long, stout, erect, 1 line long, persistent, minutely puberulent near tip; stigma depressed, slightly capitate.

Hab. On the slopes of Mount Tongariro, west side, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. A species allied to *G. rupestris*, Br., (of which I have two large drawings with dissections,²³⁹) but

239 WC: Viz., A. Richard, "Flora N.Z.," tab. 27; Hook, fil., "Flora N.Z.," tab. 42.

differing widely in its margined leaves, in its long and pilose bibracteate pedicels, in its long narrow free-spreading and entire calycine lobes, and in its fruit not being depressed but erect like a small gun-cap.

Genus 4. Leucopogon, Br.

1. *L. heterophyllus*,²⁴⁰ sp. nov.

Plant low, shrubby, diffuse, spreading, much branched; branches slender, erect, 4–8 inches high, leafy; young ones pubescent. Leaves imbricate, small, 1–1½ lines long, of various shapes and sizes—oblong, narrow-oblong, ovate, and elliptic; tips thickened and very obtuse, concave, glabrous, shining, coriaceous, 3–5-nerved, striate below, pale green, narrowly margined; margins finely ciliate; petioles red, glossy, those of the narrow leaves slender, ½ line long, not dilated at base, [199] increasing in length at tips of branches around flower, those of the wider and smaller leaves very short, broad, dilated and sub-amplexicaul. Flowers few (seen), small, terminal, solitary, sessile; bracts very small; calycine lobes ovate, nerved, striate; margins membranaceous, ciliate. Corolla tubular, 2 lines long, red, glabrous on the outside; lobes 5, narrow, sub-linear-ovate, one-third length of tube, slightly spreading, densely bearded within with white wool. Anthers oblong, wholly enclosed in top of tube; style capitate, stout, nearly half the length of tube. Drupe globular, rather large, 2 lines diameter, dark-pink-red; style persistent.

Hab. "On the arid lava-flow, among scoria, etc., altitude, 3,000 to 4,000 feet," western slopes of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. Of this plant I have only seen three flowering specimens, each specimen though much branched bearing only a single flower. I suspect the true flowering season was long past, and though I had several leafing specimens, two only bore fruit,—a single drupe on each! It is, however, very distinct from the other known New Zealand species, and may possibly prove to be identical with one of the many described Australian ones; to some of them it evidently approaches very closely.

Genus 6. *Epacris*, Smith.

1. *E. affinis*,²⁴¹ sp. nov.

Plant shrubby; branches slender, close, ascending, 9–10 inches high, leafy from near base; branchlets pilose. Leaves dusky-olive-green, numerous, imbricate, sub-adpressed, $\frac{1}{2}$ –2 lines long, mostly broadly ovate, sometimes sub-rhomboidal and orbicular-oblong, obtuse, coriaceous, smooth, shining, keeled; tip thickened; margin slightly incurved; petioles very short. Flowers numerous in corymbs at tips of branches; pedicels short, 1 line long; bracts broadly ovate and (with calyx lobes) 1-nerved, striate; calyx lobes ovate, margins finely ciliate, incurved. Corolla lobes wavy, rather long, rounded, obtuse, much recurved, red-brown; anthers large, oblong, exserted, dark-red; filaments curved. Seeds very small, triangular, smooth, edges thickish, obtuse,

241 *Stet.*

yellow-brown, flattish on one side and gibbous on the other.

Hab. "On the arid lava-flow, altitude, 3,000 to 4,000 feet," western slopes of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. This species is nearly allied to *E. alpina*, Hook.f., (discovered by me in the same mountainous region,) but differs in its more close habit, its smaller adpressed and variable leaves, its narrower and ciliated bracts, and its corymbose flowers. In this last character (rather unusual in the genus) it approaches [200] *E. corymbiflora*, Hook. f., a Tasmanian species. It flowers plentifully; but my specimens had long passed flowering, and I have (after a careful search) only seen two flowers, which appeared remarkable for their large exserted anthers. Better specimens, however, are much wanted.

Genus 8. *Dracophyllum*, Lab.

1. *D. rubrum*,²⁴² sp. nov.

A small shrub of (apparently) erect growth. Branches, 3–4 inches long, slender, erect, greyish, scarred; branchlets $\frac{1}{2}$ –1 inch long, very slender, distant and 1–2 together, erect, red-brown, glabrous, ringed, 10–14 leaves at tips. Leaves rigid, erect and sub-recurved, imbricate and sheathing at bases, 1 inch long, subulate, $\frac{1}{2}$ line wide at widest part near dilated base, which is 2 lines wide, subquadrate, and many-nerved, very narrow and half-terete at top (not keeled), tip obtuse, margins finely and closely serrulate; the lower $\frac{2}{3}$ of leaf canaliculate above and

242 *Dracophyllum recurvum* Hook.f.

suddenly stopped, the leaves deeply marked (bass-relief) with 2–3 impressions of the leaves in their growth; margins of dilated sheathing portion finely ciliate.

Flowers terminal in close sub-corymbose heads or broad short spikes of 9 flowers, shortly pedicelled; floral bracts shorter than flowers, deltoid, 2½ lines long, 2½ lines wide at base, amplexicaul, many-nerved; margins ciliate; tips thickened, obtuse. Calycine leaves much shorter than corolla-tube, ovate, acute, glabrous, veined, margins ciliate. Corolla orange-red, 3 lines long, 2½ lines diameter; lobes deltoid, tips thickened, incurved. Anthers broadly-oblong-ovate, tip truncate. Hypogynous scales obovate-oblong, truncate. Style short, stout; stigma capitate. Capsules (immature) very small at bottom of tube.

Hab. High lands, base of Mount Ruapehu (Tongariro Range), County of East Taupo; whence specimens were brought by a visitor and given to me (with some others) in 1879.

Obs. A species having affinity with *D. recurvum*, Hook, f., and also *rosmarinifolium*, Forst., but differing from them in its broader heads of larger and richly coloured flowers, shorter sepals and bracts, and leaves not keeled and very peculiarly marked.

ORDER L.—BORAGINEÆ.

Genus 1. *Myosotis*, Linn.

1. *M. hamiltonii*,²⁴³ sp. nov.

A prostrate, perennial, spreading herb; the whole plant strigosely hairy. Stems sub-erect, 7–12 inches high, usually simple (one specimen seen forked). Leaves few, small; radical sub-orbicular, 4–6 lines diameter, slightly apiculate, tapering; petioles 6–8 lines long, much dilated at base, margins ciliate; [201] caudine similar, but smaller, alternate, distant, those below the middle of stems very distant; hairs on upper surface coarse, from raised black points (and so on calyx). Racemes slender, 4 inches long, 16–20-flowered. Flowers pure white, distant, alternate, very distant below; pedicels 2 lines long, curved, hairy. Calyx dark-green, shining, 5-cleft, cut one-third down, segments ovate, 3-veined, sub-acute, coarsely hairy, largely ciliate; hairs stout, red, rather distant. Corolla infundibuliform; tube cylindric, 2 lines long, veined (as also limb); scales of throat small, roundish, entire, dark-coloured; limb 4 lines diameter, lobes rounded, deeply cut, much spreading, smooth, margins slightly irregular; stamens included; anthers ovate-lanceolate, hastate; style exserted, curved, tip papillose. Nuts broadly ovoid or oval, dark-brown, shining, margined, sides nearly equal.

Hab. Stony edges of a watercourse on the Huiarau Mountain Range, running into Lake Waikare, County of Whakatane; 1887: *Mr. A. Hamilton.*

Obs. I. This slightly rambling plant covers mossy, boulders in its native habitat, somewhat after the fashion of our creeping *Epilobiums*, presenting an elegant

243 *Myosotis forsteri* Lehm.

appearance from its profusion of virgin white flowers. As a species, it will rank under section 3, "Handbook N.Z. Flora," being allied to *M. australis* and to *M. forsteri*, but widely differing in several characters.

II. I have much pleasure in naming it after its kind and zealous discoverer, Mr. A. Hamilton, of Napier.

ORDER LIII.—SCROPHULARINEÆ.

Genus 7. *Veronica*, Linn.

§ I. Capsule dorsally compressed.

1. *V. cookiana*,²⁴⁴ sp. nov.

Plant a low glabrous shrub, 1½ feet high; branches stout, short, diffuse. Leaves broadly oblong 1½–2 inches long, ¾–1¼ inches wide, suddenly sub-acute; sub-coriaceous, sub-sessile; midrib lower half pubescent beneath; margins thickened, much and closely pubescent; petioles short, very broad, largely dilated, somewhat winged, pubescent, margins hairy. Flowers closely sub-terminal at tips of branches, presenting a thyrsse-like appearance in 5 stout erect axillary racemes of many (000) flowers, very closely compacted, spreading in flower, but imbricated downwards (sub-pendulous) in fruit; peduncles 1–2 inches long, the lower one-third bare, densely pubescent; bracts long, narrow, subulate, pubescent. Calyx small, 1 line long, adpressed, 5-lobed (3 large and 2 narrow lobes), cut half-way to base, acute, strongly nerved, roughly pilose; margins membranous, ciliate. Corolla light-coloured with a pinkish-violet hue, [202] small, 2

244 *Hebe stricta* var. *macroura* (Benth.) L.B.Moore.

lines diameter, 4-fid, lobes spreading, nerved, the upper 3 narrow obtuse, the lower lobe narrower and acute; tube short, of equal length with calyx, much veined. Anthers 2, exserted, large, cordate-reniform, bases divergent and much produced; filaments curved, stout, spreading; style 3 lines long, flexuous. Capsule broadly ovate or sub-rhomboïd, 2 lines long, sub-compressed.

Hab. Cliffs, sea-side, near Table Cape; 1887: *Mr. H. Hill.*

Obs. I. The affinities of this plant are with *V. macroura*, Hook, f., and with some states of *V. salicifolia*, Forst.; but I think it to be abundantly distinct from both. I regret my specimens having been damaged in their long transit.

II. I have with much pleasure named this sea-side species after our illustrious countryman and navigator, Cook; and that for two reasons: (1.) No plant of our New Zealand flora at present bears his honoured name, though a genus was early dedicated to him by the botanist Gmelin (since merged in *Pimelea*); and, nearly forty years ago, our second species of *Phormium* was named after him, which has also been altered: while several New Zealand plants bear the names of subsequent navigators in these our southern seas. (2.) In my selecting this seaside shrub for this purpose, I have pleasingly fancied that it was seen in its originally cliffy abode by Cook and his party, while slowly and closely coasting along the bold shores of Table Cape, on their leaving Poverty Bay for Hawke's Bay.

2. *V. compacta*,²⁴⁵ sp. nov.

245 *Parahebe hookeriana* (Walp.) W.R.B.Oliv.

Plant small, shrubby, sub-prostrate and ascending, 4–6 inches high, much and closely branched; branches short, slender, rooting, very leafy, pubescent, with a line of large white hairs decurrent on each side from petiole (resembling *Stellaria media*). Leaves small, numerous and close, elliptic and obovate, 1–2–3 lines long, obtuse, deeply cut-crenulate, 1–2 (or, rarely, 3) incisions on each side, thick, green, glandular-hairy and ciliate; margins thickened; midrib sunk and coloured on upper surface; petioles short, stout, dilated at base, semi-amplexicaul. Flowers sub-terminal, on rather long slender axillary sub-corymbose panicles, erect, 2–2½ inches long, 6–8-flowered; flowers distant, free; pedicels long, spreading, slender, ½ inch long; bracts ovate; peduncles, pedicels, bracts, and calyces glandular-hairy. Calycine lobes 4, cut to base, sub-ovate, obtuse, 3–4-nerved, half the length of capsule. Capsule large (for plant), sub-orbicular, 2 lines diameter, turgid, glabrous, not compressed. Seeds small, numerous, broadly-elliptic or sub-orbicular, smooth, flattish and sub-concave on one side, and slightly gibbous on the other. [203]

Hab. On the lava slopes of Mount Ngaruahoe, Tongariro Range, “altitude 5,000 feet,” County of East Taupo; 1887: *Mr. H. Hill.*

Obs. A species near to *V. nivalis*, Hook, f., but a smaller and slenderer and more branched plant, differing in its smaller and glandular-hairy leaves of another form, which also dry green; in its longer and more lax peduncles and pedicels, and in its capsules not being compressed and much larger than their calyces.

Unfortunately, I have not seen any flowers. The plant, in

its upright and close dwarf growth and habit, strongly reminds one of the dwarf box edging used for garden borders.

§ II. Capsule laterally compressed, didymous.

3. *V. vulcanica*,²⁴⁶ sp. nov.

Plant herbaceous, perennial; roots long, fibrous; stem prostrate, sub-ascending, 8–9 inches long; the whole plant (except corolla) densely hairy; hairs white, curly, sub-strigose; stems woody at bases, slender, flexuous, rooting from nodes, much branched; branchlets short. Leaves numerous, opposite, round and rotund-obovate, thick, 2 lines diameter, coarsely crenate-lobed (4–5 divisions); petioles length of leaves, broad, channelled, tripli-nerved. Flowers in small corymbs at tips of branchlets; pedicels 1 line long with a foliaceous bract at base. Calyx 4-lobed, cut to base; lobes obovate, adpressed, 2 lines long, longer than capsule. Corolla large, 3 lines diameter, 4-lobed, cut half-way down, the three upper lobes broadly rounded, the lower narrower and much smaller, veined; veins branching at tips; tube 0. Anthers 2, included, cordate; filaments short; style long, exserted; stigma capitate, rugulose. Capsule broadly obcordate, emarginate, didymous, 1½ lines diameter, a little turgid, shorter than calyx. Seeds (immature) small, broadly oval, pale; apparently few.

Hab. On the lower slopes of Mount Ngaruahoe, Tongariro Range, "altitude 4,700 feet," County of E. Taupo; 1887: *Mr. H. Hill.*

246 *Parahebe spathulata* (Benth.) W.R.B.Oliv.

Obs. A very peculiar and distinct species.

4. *V. longiracemosa*,²⁴⁷ sp. nov.

Plant herbaceous, annual; roots short, fibrous; stem decumbent and sub-erect, 14–20 inches long, simple, rather weak; whole plant roughish sub-strigosely hairy. Leaves reddish-brown (? in age), few and distant on stem at base, broadly cordate, 8 lines long, the same breadth at base, 5-nerved, veinlets reticulate; margins irregularly incised, coarsely crenulate; tips broadly rounded, obtuse; petiole very short; the lower stem leaves smaller and narrower, sub $\frac{1}{2}$ inch, soon decreasing in size upwards. Main stem yellowish, racemed, 16 [204] inches long, simple, with 2 pairs of floral branches below, opposite and axillary (from a leaf), 8–9 inches long, flowers numerous, regular, free, sub $\frac{1}{4}$ inch apart; pedicel 1 line long, stout; bract at base lanceolate, obtuse, much ciliate, rather longer than calyx; petiole short. Calycine segments 4, split to base, linear-lanceolate, 3-nerved, ciliate, longer than capsule; tips obtuse. Corolla (?) very small, lobes rounded, pale, mem-branaceous, much veined, minutely punctulate with dark coloured dots; anthers rather large, reniform-cordate, blue; filaments yellow-brown; style erect, stoutish, $\frac{1}{2}$ line long; stigma capitate, penicillate. Capsule yellowish, broadly obcordate-reniform, sub-didymous, deeply emarginate, 2 lines broad, slightly compressed, glabrous, veined, finely reticulated with numerous minute longitudinal cells; opening loculicidally along the margin; valves gaping; margins ciliate; style persistent. Seeds, 7–8 in each cell, oval, slightly narrower

247 *Stet.*

at base, $\frac{1}{2}$ line long, smooth, pale-brown, a little convex on one side and flat on the other; semi-transparent, the nucleus being clearly seen *in situ*.

Hab. Among herbage, grassy spots, margins of forests south of Danneverke, County of Waipawa; February, 1887: W.C.

Obs. This appears to me to be an interesting species, from its simplicity and great length of floral racemes. Unfortunately I could not obtain a single good flowering specimen, the plants having long been past flowering (indeed, were withering), but after long search I found a single minute unopened flower at tip of a raceme, whence my description of the corolla, which is necessarily imperfect. As a species it is naturally allied to our New Zealand species, *V. elongata*, Benth.; also, to some similar herbaceous Australian ones, as *V. calycina* and *V. plebeia*, of Brown; but is widely distinct from them all.

ORDER LXIII.—POLYGONEÆ.

Genus 2. Muhlenbeckia, Meisn.

1. *M. microphylla*,²⁴⁸ sp. nov.

Plant shrubby, depressed, 3–4 feet high, forming dense, thickly branched, matted, round-topped, impenetrable elastic bushes; main stems, $\frac{1}{4}$ – $\frac{3}{4}$ inch diameter, much intermixed and crooked, 2–4 feet or more long, very tough and hard, sub-rigid, black; branchlets numerous,

long, slender, flexuous, implexed and twining; bark light-red, glossy. Leaves very few, scattered, of various shapes and sizes, mostly sub-orbicular, oblate, and broadly elliptic, $\frac{1}{2}$ –1 line (rarely 2 lines) long, usually about 1 line, thickish, dull green with purple margins; tips emarginate, obtuse; petioles slender, of various lengths, generally the length of the leaf, sometimes longer, channelled, slightly puberulous; stipules minute, very membranous, sub-quadrata, wavy, brown; [205] ochrea rather large, bladdery, red-brown, margins irregular, denticulate. Flowers axillary, 3–5–7 together in short sub-corymbose racemes; pedicels very short, about $\frac{1}{16}$ th inch long, subsessile. Perianth membranous; segments cut nearly to base, large, very obtuse, crumpled, wavy, spreading, finely and closely reticulated; margins sub-crenulately erose, white with a tinge of pink, sometimes green with white margins; adhering closely to ovary when in fruit and not succulent. Stigma large, spreading, red, sub-turbinate, very roughly papillose or irregularly and largely sub-muricate. Nuts small, $\frac{1}{10}$ th inch long, blackish-brown, sub-rhomboidal or broadly lanceolate, sub-acute, triquetrous, one-third exserted, finely tuberculate or rugulose, not glossy.

Hab. Dry stony places; on ridges and mounds on hills, various places in Hawke's Bay; 1850–1886: W.C.

Obs. This plant I have long known, but had always until lately considered it to be identical with *M. axillaris*, Hook. fil., without, however, having closely examined it. I now find it to differ largely from that species in several important characters; also from the *M. axillaris* of Australia and Tasmania, which is said to be the same as

the New Zealand species. This plant is a considerably larger and stouter one, of a different habit, with much smaller leaves and more numerous flowers, that differ in many respects as to inflorescence, texture, form and colour of perianth, size and shape of stigma, form and appearance of nut, etc. Notwithstanding, it is closely allied to *M. axillaris* in natural sequence.

ORDER LXVII.—THYMELEÆ.

Genus 1. *Pimelea*, Banks and Solander.

1. *P. stylosa*,²⁴⁹ sp. nov.

A (?) small shrub of compact erect growth; branchlets rather stout, erect, sub-fastigiate; bark reddish-grey, rough with numerous minute black muricated specks, and densely clothed with coarse short greyish hairs. Leaves yellowish-green, glabrous, close, erect, sub-imbricate, broadly lanceolate-ovate, obtuse, 4 lines long, coriaceous, much wrinkled below, very broadly keeled, petiolate; petiole thick, 1 line long. Floral leaves oblong, about same length as caudine but a little broader and more obtuse, sessile, margined, dark-green, veins closely and largely anastomosing, visible when held between eye and light. Flowers pinkish, terminal at tips of branches, 10–12 together, forming corymbose-like heads; perianth 7 lines long, thickly and coarsely hairy on the outside; limb 4 lines diameter, lobes oval, obtuse, strongly 1-nerved with veins much branched and anastomosing; tube red, rather slender, veined. Filaments exserted, long, stout, spreading; style very long. [206]

249 Possibly *Pimelea buxifolia* Hook.f.

Hab. High lands near Mount Ruapehu (Tongariro Mountain Range), County of East Taupo; where specimens were gathered and brought away by a visitor, and given to me in 1879.

Obs. A species near *P. buxifolia*, Hook.f., but the leaves are without lateral nerves, ("so conspicuous and evident in that species and forming a good character," Hook., "Handbook N.Z. Flora;") the floral leaves are smaller, the flowers very much larger, coloured, with coarser hairs, the filaments very stout and long, and the bark not "black."

Class II.—MONOCOTYLEDONS.

ORDER I.—ORCHIDEÆ.

Genus 15. *Thelymitra*, Forst.

1. *T. cornuta*,²⁵⁰ sp. nov.

Tuber 3 inches long, sub $\frac{1}{2}$ inch thick, cylindrical. Stem erect, 17 inches high, rather slender, with 3 membranaceous acuminate acute adpressed bracts. Leaf single near base, lanceolate, 3 inches long, $\frac{1}{2}$ inch wide, stout, thickish, semigrooved, tip sub-acute. Flowers 6, small, rather distant on a 3-inch raceme; pedicels slender, 4–5 lines long; floral bracts shorter than ovary, 6–7 lines long, ovate-acuminate, acute, much veined. Perianth, petals clear pink, sub-rhomboidal, 4 lines long, obtuse with a slight mucro, obsoletely 5-nerved; sepals a little larger than petals, oblong-ovate, concave, dull pink with

250 *Thelymitra longifolia* J.R.Forster & Forst.f.

a green centre; column 2–2½ lines long, rather slender, pink, hooded; the hood smooth on the back, the base dark-red; tip bright yellow, emarginate, margins entire or very slightly erose, involute; the lower lateral margins between apex and staminodia produced into 2 little curved pointed horns, one on each side; the two lateral lobes (staminodia) sub-linear-spathulate, erect, bearing a globose bushy tuft of pinkish-white hairs, which rise above the column; hairs wavy, rugulose, obtuse, slightly knobbed at tips, hyaline with minute circular dots scattered within (not transversely barred, or septate, as in *T. nuda*); anther wholly concealed, erect, orbicular, very apiculate, tip obtuse; rostellum bifid, lobes rounded, margins thickened laciniate and jagged. Ovary long, ¾–1 inch, narrow ovoid, striate, tapering, trilateral; angles obtuse, thickish, and largely rounded.

Hab. Country near Pouto Point, North Kaipara, West Coast, north of Auckland; 1885: *Mr. C. P. Winkelmann.*

Obs. I. This species differs in several respects, particularly in its column and appendages, from all our known indigenous species; and also from the Australian and Tasmanian ones. It will naturally range under Bentham's section *Cucullaria*, [207] its affinities being with *T. nuda* and its allies. Its flowers are very small for the size of the plant, and its ovary long.

II. In the summer of 1885 I received several specimens of *Thelymitra* from Mr. Winkelmann, but from their being long in transit, partly smashed up in passing through several of our post-offices, and from their succulent nature and close-packing half-rotten, I could make nothing of their flowers; the tubers, however, of some of

them were uninjured, and I planted them; one, in particular, being long and slender, I potted. This summer (December, 1886) it produced the specimen here described. I have closely examined three of its flowers in a living state for their internal parts, and find them to correspond closely.

2. *T. concinna*,²⁵¹ sp. nov.

Plant small, stem 4½ inches high, slender. Leaf single, narrow, 3 inches long, thin, rather membranaceous. Flowers 2, small, sub ½ inch diameter; sepals ovate, acuminate, nerved, brown; petals blue with a tinge of purple, broadly ovate, apiculate, broader than lip; column slightly hooded; margins plain, largely winged below; staminodia arising from a strong nerve, long, curved, erect, finely filiform, with only a few long and free hairs at tip, springing from 2–3 branches; hairs reddish, clavate.

Hab. Open country near the east bank of the River Mohaka, north of Napier; 1884: *Mr. A. Hamilton.*

Obs. I regret that I have only had a single specimen of this interesting little plant, which I believe to be a very distinct species. Mr. Hamilton was also struck with its peculiar and neat appearance when he gathered it, and though he sought other specimens he was unsuccessful; sheep being pastured there in that locality, soon destroy all small tender indigenous vegetation. Hitherto I have deferred publishing it, although I had examined and noted its characters (as above) while fresh, wishing first to obtain more specimens. Its small and graceful

251 Probably *T. hatchii*.

appearance, thin leaf, blue petals, narrow lip, and few reddish hairs springing in distinct bundles or branches from its staminodia, are peculiar characters. It is to be hoped that its discoverer may meet with more of the same plant when again in those parts.

3. *T. nervosa*,²⁵² sp. nov.

Rather slender, straight, erect, 9–10 inches high; a white glossy sheath at base, 1 inch long, transparent, veined, truncate, margin entire with a long narrow linear mucro; 2 distant sheathing caudine bracts each $1\frac{1}{2}$ inches long, acute, adpressed. Leaf single, 6 inches long, 3 lines wide, linear-acuminate, sub-membranaceous. Scape very slender almost wiry at top, bearing 3 distant flowers; floral bracts coloured, very broad, $\frac{1}{2}$ inch [208] long, acuminate with a long mucro, veined, minutely papillose on tips at outside, the upper flower having 2 bracts opposite, the inner one much smaller; pedicels slender, $\frac{1}{4}$ inch long. Perianth purple, 1 inch diameter, spreading, all segments much veined, veins branching; dorsal sepal oblong apiculate; lateral sepals ovate-acuminate apiculate; lateral petals sub-obovate apiculate; labellum broadly oblong-lanceolate, obtuse; column black-purple above, largely bifid, each lobe 1-notched, incurved; the two appendages each on a long slender arm arising from below as high as the column; largely plumose at top in a globular ball; hairs very flexuous, sub-moniliform, twisted, their tips obtuse and rounded; anther broadly ovate, obtuse, apex below top of column. Ovary lanceolate, $\frac{1}{2}$ inch long, coarsely ribbed.

252 *Stet.*

Hab. High lands base of Mount Ruapehu (Tongariro Range), County of East Taupo; whence specimens were brought by a visitor in 1879,²⁵³ and given to me with some other plants (*sps. nov. supra*).

Obs. This is another small neat-looking species, with large dark-coloured flowers, their segments much veined (as also are their coloured bracts), the lower lobe or labellum being larger than the others. The number of the flowers on a plant vary, usually 3, but in one of my specimens 2, and in another only 1; each of these two plants being also smaller. A striking character is the low branching of its slender staminodiæ or lateral lobes of its column which are also elongated, and their peculiar wavy moniliform hairs. There may be more basal sheaths belonging to the plant, as my specimens do not include their roots or tubers.

A Note on Thelymitra.

I would here mention two deformed or abnormal specimens of this genus which have come under my notice; both of them obtained in 1884, in the hilly forests near Norsewood, and apparently varieties of *T. purpureo-fusca*, Col.²⁵⁴

1. A small 1-flowered specimen; the perianth consisting of only four equal segments.
2. Another small specimen; the column of its perianth containing 3 staminodiæ, one of them being in front,

253 The visitor was the photographer William Collie, as Colenso later explained (*Trans. xxvi: 484*).

254 WC: "Trans. N.Z. Inst., vol. xvii., p. 349.

arising from the junction of the two wings at the lower front base, and with the other two lateral ones curiously enclosing the top of the column.

Genus 17. *Prasophyllum*, Brown.

1. *P. variegatum*,²⁵⁵ sp. nov.

Stem slender, erect, 5 inches high, green above, red below, minutely speckled with white papillose spots, sulcated on one [209] side, with a loose sheath below near base. Leaf, $\frac{1}{4}$ inch under spike, very short, about $\frac{1}{2}$ inch long, striate, adpressed, subacute, tip thickened. Spike short, $\frac{1}{2}$ – $\frac{3}{4}$ inch long, few (3, 5, 8,) flowered; flowers rather distant, drooping; bracts very small, adpressed, broad, truncate and retuse. Perianth greenish tinged with red, small, 1– $1\frac{1}{2}$ lines long; dorsal sepal broadly ovate, 3-veined, tip acute; lateral sepals ovate-acuminate, 3-nerved, tips sub-mucronate, dilated; lateral petals very small, narrow, lanceolate-acuminate, 1-nerved, tips acute, labellum short, sub-cordate-ovate, sub-acute, reticulately veined, 1-nerved, the nerve central and very narrow, margins red, sub-tuberculate-fimbriate; anther large; column very short. Ovary sub-erect, 3 lines long.

Hab. Glenross, County of Hawke's Bay; 1887: *Mr. D. P. Balfour.*

Obs. I have received several specimens of this plant, but all, save one, had just passed flowering; they were very much alike, merely differing (as above noted) in the number of their flowers.

255 *Corunastylis nuda* (Hook.f.) D.L. Jones & M.A. Clem.

ORDER VII.—LILIACEÆ.

Genus 5. *Astelia*, Banks and Solander.

1. *A. planifolia*,²⁵⁶ sp. nov.

Leaves sub-coriaceous, linear, very acuminate, 24–26 inches long, $\frac{1}{2}$ inch wide at middle and 1 inch at dilated base, flat, upper surface glabrous, dull light-green; lower surface hairy; hairs short, closely adpressed in uniform dot-like patches; margins flat, entire, and slightly and sparsely sub-ciliate; 8-nerved, the two central nerves narrow, very prominent on upper surface; the base dilated with a few short hairs, margins very thin. Scape (*fem.*) 3–4 inches long (including short raceme), stout, erect, cylindrical below but obtusely sub-triquetrous above, clothed with short adpressed white hairs, (as also pedicels, and outsides of floral bracteoles,) with 4 cauline foliaceous bracts, the lowermost 8 inches long, very acuminate and nearly as wide as the leaves, sub-amplexicaul, slightly silky and shining; raceme sub-corymbose, short, about $\frac{1}{2}$ inch long, composed of 10–20 flowers; pedicels very stout, 3 lines long, close together and subverticillate, each with a long subulate bracteole at base. Flowers: perianth whitish, glabrous, very membranous, spreading, sub-rotate, adhering to ovary below middle; segments 6 (sometimes 4, 8,) linear-ovate, split nearly to base, tips incurved; the three outer broader than the three inner ones, reddish, scarious, obsoletely 1-nerved, reflexed in age; style 0; stigma, short, sessile, obtuse, obscurely 3-lobed, papillose; anthers (abortive) long, narrow, opposite segments. Ovary sub-rhomoidal

256 *Colospermum microspermum* (Colenso) Skottsb.

or broadly ovoid, green, glabrous; beak short, slightly grooved; seeds immature. [210]

Hab. Forests, Pohue, hilly country west of Napier, Hawke's Bay, growing in rather small tufts on rotten logs; 1884: *Mr. A. Hamilton.*

Obs. I have received only one flowering specimen of this plant; and this I have had some time by me. At first sight I saw it was widely different from all the other (now) many species of this peculiar and interesting genus known to me, and I delayed making it known, hoping to obtain further specimens of it bearing ripe fruit (as Mr. Hamilton had planted it in his garden); also a specimen of the male flower from its native woods. A species having affinity with *A. graminifolia*, mihi.²⁵⁷

ORDER XI.—CYPERACEÆ.

Genus 13. *Uncinia*, Persoon.

1. *U. capillaris*,²⁵⁸ sp. nov.

Plant small, densely cæspitose in large patches. Culms few, 8–10 (rarely 12) inches long, exceedingly slender, almost capillary, sub-cylindrical, channelled smooth, erect, tips drooping; leafy, 4–5 sheathing leaves on stem. Leaves numerous, a little shorter than culms (sometimes, though rarely, longer), $\frac{1}{50}$ th-inch wide, green, striate, channelled, keeled, sub-erect, drooping at tips, margins slightly scaberulous; tips truncate and thickly scaberulous; below 2–3 sheathing basal bracts with long awn-like tips; young leaves capillary. Spikelets

257 WC: "Trans. N.Z. Inst.", vol. xix., p. 267.

258 *Uncinia banksii* Boott.

distichous, lax, $1\frac{1}{2}$ – $2\frac{1}{4}$ inches long, with 4–7 distant spreading *fem.* flowers; the upper portion, $\frac{1}{2}$ inch, *male* flowers which are closer. Bract 0. Glumes fugacious, ovate, sub-acute, $\frac{2}{3}$ rds length of utricle, smooth, nerve stout and more so at tip, margins around apex produced, hyaline. Utricle 3 lines long, narrow-lanceolate, triangular, smooth, striate, greenish (light-brown in age); bristle 2 lines long, slender, flexuous, spreading, white; hook large. Style long and very rough; stigmas 2, long, curled.

Hab. In thick dry woods, south of Danneverke, County of Waipawa; 1887: W.C.

Obs. A species peculiar for its mode of growth, forming large and thick spreading patches; also for its excessively narrow leaves and culms, lax, distant and few-flowered spikelet, and bifid stigma.

2. *U. disticha*,²⁵⁹ sp. nov.²⁶⁰

Plant forming straggling tufts, much drooping. Culms 22 inches high, slender, sub-angular, channelled on upper surface, scabrid, leafy with 4–6 sheathing leaves on culm. Leaves (and culms) green, about same length as culms, linear, $\frac{1}{20}$ th inch wide, flat, striate, veins red, keeled, scaberulous, very acuminate, tips sub-acute, much drooping. Spikelet small, weak, distichous, $1\frac{1}{2}$ –2 inches long; *fem.* flowers 6–7, lax; the upper $\frac{1}{2}$ inch [211] *male*, and more compact. Glume persistent, ovate, sub-acute, nearly as long as utricle, whitish, smooth, 1-nerved;

259 *Uncinia scabra* Boott.

260 WC: I note that Müller has a species "debilio,"—W.C.

nerve stout, greenish. Utricle lanceolate, stoutish, $2\frac{1}{2}$ lines long, sub-half-terete, scabrid towards top, whitish; bristle erect, 2 lines long, white; hook 1 line long, brownish, thick and dark at bend, tip excurved, subacute. Style long, stigmas 3, very long, flexuous, and (with style) roughish.

Hab. In dry woods with preceding species, *U. capillaris*, Col.; 1887: W.C.

3. *U. variegata*,²⁶¹ sp. nov.

Plant forming fine medium tufts. Culms 18 inches long, erect, rather stout, sub-rigid, smooth, pale green, finely striate with white lines, triquetrous, angles very obtuse, with one side broader and flat and two sides deeply channelled. Leaves longer than culms, 2 feet long, 2 lines broad, green, many-nerved, striate, sub-flaccid, keeled, keel white, minutely scaberulous on keel and margins. Spikelet cylindrical, stout, thickly set with flowers, sub-sexfariously disposed and closely imbricated by its long glumes concealing the utricles, 4 inches long, 4–5 lines broad, brownish variegated with green lines from glumes and bristles; the upper portion *male*, $\frac{1}{2}$ – $\frac{3}{4}$ inch long, narrow, cylindrical, very compact. Bracts at base, 2, nearly close together and opposite, scabrid; one very long, foliaceous, flaccid and spreading, 9 inches long; and one much smaller, the length of spikelet, setaceous, erect, adpressed to spikelet; tips obtuse, sub-clavate. Glumes of female large, $4\frac{1}{2}$ lines long, $\frac{1}{20}$ th inch wide, lanceolate, sub-acute, nearly covering both utricle and bristle, pale light-brown; 3-nerved (obsoletely 5-nerved

261 *Uncinia ferruginea* Boott.

at base), central nerve wide but not prominent, green, reticulated; cells long, narrow. Glumes of male very similar, but a little shorter. Utricle broadly ovate-acuminate (or sub-rhomboidal) tapering a little at base, 2 lines long, dark-reddish-brown, smooth, glossy, turgid; bristle slender, 2–2¼ lines long, erect, green; hook brown. Seed broadly-oblong, smooth, shining, sub-triangular, flattish and slightly concave on one side, edges obtuse, even, not raised or margined. Style very short, sub $\frac{1}{50}$ th inch, rough; stigmas 3, very long (2 lines), spreading, flexuous, rough and shaggy with broad flat patent hairs. Anthers linear, sub-acute, scarcely appearing from within glumes; filaments short.

Hab. Sides of streams in forests near Danneverke, County of Waipawa; 1887: W.C.

Obs. A species having pretty close affinity with *U. australis*, Persoon, and *U. ferruginea*, Boott; and also with *U. alope-curooides*,²⁶² Col.; differing, however, from them all in several important characters (*vide descript.*).

262 WC: "Trans. N.Z. Inst.", vol. xv., p. 335.

1887 On newly discovered and imperfectly known Ferns of New Zealand, with Critical Observations. *Transactions of the New Zealand Institute* 20: 212-234.

[*Read before the Hawke's Bay, Philosophical Institute, 11th July, 1887.*]

Class III.—CRYPTOGAMIA.

ORDER I.—FILICES.

Genus 1.²⁶³ Gleichenia, Smith.

§ EUGLEICHENIA.

1. *G. patens*,²⁶⁴ sp. nov.

Plant erect, about 3–4 feet high (from specimens received). Rhizome creeping (apparently epigaeous), very long (in specimens 2 feet or more), rather slender, 1½ lines diameter and of uniform thickness, pretty straight, rarely branched, light reddish-brown (as also stipe), roughish (sub-muricate); scales few, scattered, broadly ovate-cordate, reticulate, coarsely fimbriate; rootlets numerous, wiry, branched, 1–3 inches long, descending from under-surface only at irregular distances, ½–1 inch apart, single and in bunches of 2–3, resembling nodal rootlets. Stipes about 2 feet apart on rhizome, 2–3 feet long, dry, slender, uniform, cylindrical, about 1 line diameter, hollow with a central pith, straight and sub-

263 WC: The numbers attached to the orders and genera in this paper are those of them in the "Handbook, Flora of New Zealand."

264 *Gleichenia microphylla* R.Br.

flexuous, smooth, shining, 2-branched at top, these two main branches opposite, squarrose, spreading, with a large bud in their axil (also in the axils of the secondary branches), and 4 pinnæ at their bases, 2 up and 2 down. Frond large, spreading, dichotomous, distantly branched at almost right angles; branches and branchlets very slender, sub-bipinnate, light-red-brown; rhachis and sub-rhachises thickly covered with dark-brown adpressed scales (similar to those on rhizome), their fimbriæ or stout hairs patent, rigid, dark, wavy, acute; branchlets sub-linear-ovate or linear-oblong, 5–6 (sometimes 8–9) inches long, 2–3 inches wide, ultimate branchlets forked, imparipinnate. Pinnæ petiolulate, free, linear not acuminate, 1–½ inches long, 1–2 lines wide, bright green above, a little paler below, glabrous, patent and sub-falcate, symmetrical, very distant, 2–3 lines apart and alternate on rhachis, 3–5 lines apart opposite and sub-opposite on secondary branches, sometimes, though rarely, 2 together, and sometimes forked; midrib truncate, or with a smaller oblique lobe at apex; lobes distinct, cut to rhachis, alternate, close at bases but [213] divergent at tips, presenting a zig-zag appearance, the lowest pair opposite larger and more distant, semi-elliptic or sub-quadrilateral, with top rounded, apiculate, flat margins not recurved when fresh, membranaceous, full of minute pellucid dots when held up between the eye and light; veins pinnate, sub-flexuous. Sori few, scattered, a single sorus on a lobe on the middle of anterior veinlet nearer margin than midrib, mostly containing 2 capsules, often only 1, more rarely 3. Capsules sessile, globular, pale, shining, superficial.

Hab. Near to hot springs at Wairakei, Taupo; 1887: *Mr. C. J. Norton.*

Obs. I. This species is closely allied to another of our New Zealand species, *G. punctulata*, Col.,²⁶⁵ which, however, is a much smaller plant; also, but much less so, to two Australian species, *G. microphylla*, Br., and *G. circinata*, Sw.; (this latter species, however, is said by several botanists—Sir J.D. Hooker, Baker, and Bentham—to be one with Brown's plant). The species here described differs from them all in several particulars, some of which are grave characters; especially in its plane soft membranaceous and truncate pinnæ, which are also almost unicoloured, with apiculate lobules, in the paucity of capsules in a sorus, and in its highly peculiar fimbriate scales.

II. Swartz has given a very clear and full description of his typical *G. circinata* in his "Synopsis Filicum," from which work (as I think it is very rare here among us) I extract a brief portion, viz.:—"G. CIRCINATA: pinnæ sessiles lineares sub-filiformes rigidulæ: pinnulæ" (lobes), "sub-coadunatæ semi-rotundæ, minutæ, convexæ, subtus concavæ, costaque pubescentes: sori ex capsulis sæpissime quatuor in foveola margini sub-immersis;" and, again:—"Obs. Distinguitur a *G. polypodioides* pennis longioribus pubescentia notabili et soris plerumque ex quatuor capsulis compositis." (*loc. cit.* p. 394.)

265 WC: "Trans. N.Z. Institute," vol. xvii., p. 345. See also my general observations there.

III. To any observant person, whether botanist or not, acquainted with the more common forms of our New Zealand *Gleicheniae* of this section—as *G. hecistophylla*, *G. dicarpa*, *G. alpina*, etc.—the striking difference between them and this species is apparent at first sight on seeing this fern, indeed there is but little ground of close comparison between it and them. I have received many specimens of this fern from its discoverer, in different stages of growth, to examine, and find them uniform in their characters; and having given it a long, repeated, and exhaustive examination, (aided largely by correct drawings with dissections of the allied species, *supra*,) I feel convinced that it is a truly distinct species. [214]

IV. Mr. Norton informs me, by letter, that he has seen specimens of this fern in its native habitat “8–10 feet long,” and I also find from him that it is impatient of cold, “dying down in the winter;” owing, no doubt, to its more delicate membranaceous fronds, a character which is also rare in this genus.

Genus 4. Dicksonia, L'Héretier.
§ EUDICKSONIA.

1. *D. microcarpa*,²⁶⁶ sp. nov.

Plant arborescent, caudex erect, 6–7 feet high, stout, 1 foot diameter, pretty nearly equal throughout, the outside composed of a closely compacted mass of fine brown rootlets, their surface even not shaggy nor ragged; at the upper portion under the crown of living fronds are the remains of a few old broken stipites. Fronds 30 or more, patent, a little drooping with their tips generally

266 *Dicksonia fibrosa* Colenso.

upcurved, sub-tripinnate, narrow lanceolate, 4½ feet long including short stipes, 1 foot broad at the widest part, sub-membranaceous-coriaceous, glabrous and somewhat glossy on upper surface, grass-green above, paler below; rhachis and sub-rhachises very hairy on both surfaces; hairs short, weak, flexuous, jointed, sub-glandular, brownish-grey. Stipes short, 2–3 inches long, succulent, very hairy; hairs dense, 1½ inches long, patent, fine, jointed, glossy, red. Pinnæ 45–48-jugate, alternate, sub-ovate-lanceolate, 5–6 inches long, 1¼–1½ inches wide, very acuminate, tips exceedingly long and slender, recurved, falcate, the middle ones close about 1 inch apart on rhachis, overlapping, the apical free, narrow, and simple, the ultimate pinna very long, narrow, and serrate, the basal pinnæ distant, small, decreasing gradually in size to base. Pinnules close, not crowded, symmetrical, attenuate, the lower pair overlapping rhachis above, sub-linear-lanceolate, acuminate, acute, ¾ inch long, broadest at base, and there ¼ inch wide; the midrib hairy half-way from base. Segments 8-jugate, small, subovate-deltoid, serrate, acute, 1–2 lower pairs pinnate, petiolulate, midrib flexuous, margins recurved when dry. Veins few, prominent below, pinnate, generally 3 pairs (sometimes 4 on one side), simple, rarely forked, red, translucent. Sori small, globose, biserrate, usually 4 on the larger segments at tips of veins, sometimes 3, 2, or only 1, extending to the utmost tips of pinnules and pinnæ; capsules shortly pedicelled, the joints of the ring very prominent, close, and dark-coloured; sporules bright-yellow, sub-orbicular-deltoid, obtuse. Involucre globular, 2-valved; the outer valve formed from apex of serrature of segment, the

margin scarious, thin; the inner valve scarious; margins entire.

Hab. Forests south of Danneverke, County of Waipawa
1887: W.C. [215]

Obs. This species has a pleasing appearance living, from the graceful airiness and softness and light-green colour of its rather small fronds, reminding the beholder, at first sight, of another arborescent fern of those forests, *Hemitelia smithii*, Hook. fil. (Like some other of our ferns it, unfortunately, loses its pleasing green colour in drying.) It approaches *D. fibrosa*, Col., more nearly than it does *D. squarrosa*, Swartz; but it is still more nearly allied to *D. sparmanniana*, Col.,²⁶⁷ and to *D. gracilis*, Col.,²⁶⁸ differing however from both in its smaller and much narrower fronds and segments, and also from *D. sparmanniana* in being arborescent, and in its very small sori and involucres; and from *D. gracilis* in the great difference in its caudex, and in its veins, sori, and involucres being scarcely half the number of those of that species on a segment, as well as in several other particulars. Hitherto I have not met with many plants of this species in the forests.

Genus 11. *Adiantum*, Linn.

1. *A. polymorphum*,²⁶⁹ sp. nov.

Plant small, gregarious, cæspitose in small tufts, each one usually consisting of 3 living fronds that are sub-erect but

267 WC: "Trans. N.Z. Inst.", vol. xii., p. 363.

268 WC: "Trans. N.Z. Inst.", vol. xv. p. 306.

269 *Adiantum diaphanum* Blume.

often deflexed from base of frond. Root-stock small, about $\frac{1}{2}$ inch, composed of several broken purple-brown stipites; roots fibrous, hairy. Fronds very membranaceous almost translucent, glabrous, grass-green, sub-linear-ovate, attenuate, simple pinnate (in their normal state), 2–3 inches long, broadest at base and there $\frac{3}{4}$ –1 inch wide; pinnæ 8–12-jugate, alternate, free, close and distant, somewhat semi-orbicular, the anterior margin much arcuate, the lower margin arched nearly to correspond, apex rounded, base sub-truncate or excised in a curve and so imbricating rhachis at the upper angle; the superior and apical margins of pinnæ largely crenate-lobed; lobes rounded, every alternate sinus deeper and bearing a sorus distant from outer margin of pinna, every pinna usually soriferous, and decreasing gradually in size to apex, all petiolate, the dark petiole extending a short distance into the pinna at lower basal margin, the upper pinnæ are sometimes quadrilateral; the lowest pair of pinnæ much the largest, each pinna $\frac{1}{2}$ inch long by $\frac{1}{4}$ inch broad; the terminal lobe small, rhomboid, obtuse, sometimes bearing an involucre at the extreme tip. Veins branched, dichotomous, free, rather distant, flabellate in smaller pinnæ and at base of larger pinna, the principal vein parallel with and close to the lower margin, branches unilateral; apices of barren veins curving over involucres on both sides between it and the margin of pinna. Involucres large, distant, orbicular or sub-reniform-cordate, flat, closely appressed, white with broad wrinkled [216] margins, 5–6 on a large pinna (sometimes, but rarely, 8–9 on the lowest), extending quite round the apex to its lowest corner 2–3 on the smaller pinnæ; the sinus at first narrow-linear, then

circular, in the centre of involucre. Stipes generally longer than frond, 3–5 inches, very slender, almost capillary, wiry, sub-angular, dry, brittle, glossy, dark-purple (as also rhachis and petioles), with a few short linear obtuse brown scales near base.

Sometimes a frond is met with bearing a small pinnate branchlet at its base, having 2–5 pairs of pinnæ, same as those on main rhachis but much smaller; and occasionally a frond is found with two such divergent branchlets, but smaller still at its base. I have also a specimen with two long forked branchlets forming a fork at tip of rhachis, as well as two others at base of the frond, and thus having four branchlets besides its ordinary main rhachis. Sometimes the lowest pair of pinnæ are large and irregular in shape, sub 3-lobed, and sometimes largely reniform.

Hab. On the ground at a steep declivity, forming a small bed or patch, and very closely growing together, in a thick wood south of Danneverke, County of Waipawa; May, 1887: W.C. (Not noticed anywhere else.)

Obs. I. It is difficult to fix the near affinities of this interesting little species among our known New Zealand *Adiantæ*; it has certainly a family resemblance, but that is common to the whole of them. Its nearest ally is *A. diaphanum*, Bl., a Java and Manilla fern (judging from description and drawing of that fern as given by Sir W.J. Hooker, "Sp. Filicum," vol. ii., p. 10, tab. 80), but that species differs from this one in several particulars; that one being of larger size, with differently shaped, hairy, darker colour, and obscure pinnæ, small crowded involucres, etc. Sir W.J. Hooker, has also stated (*l.c.*) that

the specimen he had there figured is an authentic type specimen of that species given to him by Dr. Blume, its discoverer.

That fern (*A. diaphanum*) is also said by Bentham²⁷⁰ to be found in Queensland, New South Wales, and New Zealand; but I have never met with it growing, though lately I received some specimens of the plant from the interior, which agree well with Sir W.J. Hooker's description and figure. Bentham's description of it, however, differs widely from Hooker's description and figures. And I also notice, that Bentham there includes one of our well-known and common New Zealand *Adiantæ*—*A. affine*, Hook., not Willd.²⁷¹—with Blume's *A. diaphanum*, as being identical with it! Baker, also,²⁷² says the same—viz., that the [217] New Zealand fern, *A. affine* of Hook. = *A. setulosum*, J. Sm., is identical with *A. diaphanum* of Blume.

Be that as it may, those two ferns (*A. diaphanum* and *A. setulosum*) are very distinct from this little *Adiantum* here described.

2. *A. tuberosum*,²⁷³ sp. nov.

Plant very small, weak, sub-erect, gregarious, cæspitose in small tufts, 1½–2 (rarely 3) inches high; rhizome creeping, pubescent, tuberous (also the numerous long and slender branched rootlets) with many little brown

270 WC: "Flora. Austral.", vol. vii., p. 725.

271 WC: "Sp. Fil.", vol. ii., p. 32.

272 WC: "Syn. Fil., p. 117.

273 *Adiantum diaphanum* Blume.

oblong and ovoid tubers singly scattered, each producing a single frond. Stipe 1–2 inches, capillary, somewhat flexuous, sub-angular, smooth, glossy, red-brown (as also rhachis and petioles), with a few small narrow acute scales at base. Frond simple, narrow oblongovate, 1–1½ (rarely 2) inches long, 5–8 lines broad at base, pinnate, mostly 5- (sometimes 7-) jugate; pinnæ alternate, distant, sub-reniform-quadrilateral, petiolate, spreading, dull green, glabrous, superior margin slightly arched, the inferior less so, nearly straight; apex broadly rounded; base slightly excised; sometimes the bases of a pair of pinnæ are imbricate; the lowest pair generally larger and sub-deflexed; the upper pinnæ subcuneate; the terminal one large 4-sided, obtuse; minutely and closely dotted (*sub lente*) with very short reddish-brown pubescence (or sub-papillose scurf) on the middle and basal portions of pinnæ under surface; margins toothed-serrate, irregularly sub-lobed. Veins distant, dichotomous, dark, coarse, rather prominent, reaching to margins and forming acute teeth. Sori few, small, distant, irregular, mostly 2–4, sometimes 5, on a pinna, very rarely 6–7 on the lowest and largest one, extending round apex, distant from margin and the margin deeply crenate; the terminal pinna bearing 4–6 sori. Involucre reniform and sub-reniform-orbicular, at first white and closely appressed, brown contracted and sub-revolute in age; sinus very large and broad.

Hab. Woods near Ormondville, County of Waipawa: *Mr. A. Hamilton.*

Obs. This species is pretty closely allied to the preceding one, but differs in several important characters. At first

sight I supposed it might be a still smaller state of that plant, but a close examination with plenty of good living specimens in all stages has convinced me of it being distinct. It is a much smaller plant, of a simple unvarying form, with a different habit of growth; the several distinct tufts of fronds closely arising from the hypogæous rhizome resemble a broad fringe; its tuberous rhizome and rootlets is a peculiar and rather strange character; the pinnae are thicker, duller and of a different shape with sharply toothed margins; veins coarse, dark, and prominent; the ultimate pinna large and bearing sori all round on its four sides; sori few and distant; involucre smaller and brown. [218]

3. A. *affine*, Willd., var. *heterophyllum*,²⁷⁴ Col.

Plant pale green, sub-erect, 10–14 inches high, forming large tufts. Stipes 6–8 inches long, slender, dry, smooth, glossy, and dark-red-brown (as also are the rhachis and stipes of pinnæ), flexuous, sub-angular above semi-terete below, with a few short hairs at base. Frond bipinnate, sub-ovate-acuminate, 5–7 inches long, few branched below; branches simply pinnate, their tips crested, spreading in 2–3 short and close branchlets, each with a large and broad 2–3-lobed laciniate and toothed ultimate pinna. Pinnæ very irregular, large and small mixed, of various sizes and shapes, narrow cultriform with obtuse tips, and sub-cuneate, 2–9 lines long, 1–2½ lines broad, the lower margin entire and curved upwards at tip, the upper laciniate and toothed, teeth white; stipitate, stipes capillary, rather long. Sori small, few (1–2–5) and rather

274 Possibly *Adiantum cunninghamii* Hook.

distant on a pinna, on the upper margin only. Involucre orbicular-cordate, pale flecked with brown dashes, dark brown in age, shining, turgid; sinus narrow.

Hab. On limestone crags at Moteo, Puketapu District, near Napier; 1885: *Mr. A. Hamilton.*

Obs. This is a curious and rather neat-shaped little fern, apparently a variety only of our more common *Adiantum*; though some of its characters (apart from the crested tips of its rhachis and branches) may prove to be distinct and grave enough to make it a good species. I have seen and examined several specimens, and find them pretty uniform in character, while varying a little in size.

Genus 15. *Pteris*, Linn.

§ 2. *LITOBRACHIA*.

1. *P. (L.) pendula*,²⁷⁵ sp. nov.

Plant cæspitose, of 4–6 fronds; caudex very short, scarcely any, composed of old stipites; roots numerous, fibrous, long, slender, spreading. Frond pendulous, broadly deltoid, 10–12 (rarely 14) inches long, membranaceous, glabrous, shining, but filled with minute sub-rugulose dots, flaccid, flat, green; rhachis straight, pale stramineous, bipinnate (the larger specimens tripinnate below); ultimate pinna of frond very long (3–5 inches), narrow-ovate- or lanceolate-acuminate, segments opposite 7–10-jugate, very distant and decurrent (which decurrence is sometimes continued down to below the third pair of pinnæ from base), the tip very narrow acuminate-caudate; pinnæ opposite, few, 4–6 pairs,

275 *Pteris macilenta* A.Rich.

distant, spreading, ovate-acuminate, their rhachises straight; petioles slender, the three lower pairs about $\frac{1}{2}$ inch long; pinnules alternate, distant, ovate-acuminate; 2– $2\frac{1}{2}$ inch long, 3–4 pairs on each secondary rhachis, the lowest (or lowest 2) on rather long and slender petioles, the upper [219] pairs sessile, decurrent, the terminal one very acuminate, often caudate; segments large, open, not crowded, spreading, mostly 5 (sometimes 6–7) pairs, opposite and regular, their margins and apices coarsely and deeply incised; the lowest pair free, narrow, oblong, largely pinnatifid, base cuneate; the upper ones deltoid, broad, (their tips sometimes largely and irregularly bilobed,) their anterior margins almost straight, sometimes subfalcate, their bases largely decurrent; apices obtuse, sometimes bifid; sinuses narrow; veins few, distant, clear, the basal veins free, with 6–7 long narrow areoles on each side of midrib of pinnule (generally from costule to costule), and 4–5 areoles on each side of costule of segment, and both extending nearly to tips; the outer veins free, forked, and branched to margins; sometimes a single second-series areole is formed between the costule areoles and outer free veins in the broader segments. Stipes 7–9 inches long, rather slender, glabrous, shining, channelled above, straw-coloured and dark-brown towards base, with a few scattered scales below. Scales dark-brown, subulate, $3\frac{1}{2}$ lines long, $\frac{1}{2}$ line broad at base, very acuminate, tip produced and truncate, margin flexuous, netted, cells large longitudinal sub-parallelogramic, walls dark and double, with oval and round dark (stomata-like) bodies scattered in them. Sori in short narrow lines (and dots) on central margins of segments both sides, not at sinus nor

near tips, the upper half of segment generally barren; sometimes the sori are more continuous on the upper decurrent wings on the main rhachis. Involucre whitish, exceedingly narrow, $\frac{1}{50}$ th inch wide (soon becoming reverted and hidden by the sori), delicate, pellucid, very curiously reticulated, the cells large with exceedingly fine and tortuous margins; margins of involucre entire, very slightly sinuous. Sporangia broadly obovate, subsessile, dark-brown, bursting in the middle, and so separating into two cups, their membrane pellucid, reticulated. Sporules triquetrous, angles obtuse, dark-brown, roughish; margins entire with a double line and transverse bands.

Hab. Ever shaded wet-dripping gravelly cliffs (among other ferns and shrubs), banks of a stream south of Danneverke Township, County of Waipawa; 1887: W.C.

Obs. I. This species of fern is nearest to our endemic New Zealand fern *Pteris (Litobrochia) macilenta*, A. Richard, but differs from it in several particulars—as habit, size, and outline of frond, and shape of pinnæ, pinnules, and segments; in its lobes being wholly and largely incised, the terminal ones being excessively narrow and caudate; its veins much more anastomosing and also branched; its lines of sori smaller and more scattered, and their involucres being very much narrower and of a different substance. [220]

II. It is not, however, without some hesitation that I bring forward this handsome fern as a new species; and I only do so after long and close examination of several specimens, including whole tufts of living plants. Of all our known New Zealand ferns (as I have already said)

this one is more nearly allied to *Pteris (Litobrochia) macilenta*. Fortunately I possess the full history of that fern, including the fine folio engraving of the type specimen, together with the ample original description of it given by its describer, A. Richard;²⁷⁶ and of that engraving Sir W.J. Hooker remarks (in his more fully describing *Pteris (Litobrochia) macilenta*): “Richard’s figure faithfully represents the frond.”²⁷⁷ Indeed, had I not Richard’s figure and description, supported as they are by Sir W.J. Hooker, I do not think I should care to describe this fern as a new species, through my not having at hand a genuine specimen of *Pteris macilenta*. There is, however, a very great amount of difference between Richard’s figure and this new plant; as is also further shown in his specific description of *Pteris macilenta*, some of which I shall quote to demonstrate how much it disagrees with that of this fern, for I suppose his botanical work containing it is but little known here among us:—“Frondibus bipinnatis … pinnulis paucioribus distantibus oblongis pinnatifidis; laciinis integris aut apice inciso-dentatis glabris, membranaceis; indusiis membranaceis margine *continuis*” (*l.c.*). And, in his further “observations” upon the newly-discovered plant, he goes on to say: “Cette espèce est bien remarquable par son port, qui la distingue au premier coup-d’œil de toutes les autres espèces du genre, et qui la rapprocherait plutôt de certaines espèces de *Lindsæa*. Ses frondes sont longues d’environ un pied et demi, et même deux pieds, et composées *d’un très-petit nombre*

276 WC: “Voyage de L’Astrolabe: Botanique,” p. 82.

277 WC: “Species Filicum,” vol. ii., p. 220.

de folioles écartées les unes des autres, et plus ou moins profondément pinnatifides. Les divisions de ces pinnules sont ou entières ou irrégulièrement dentées *a leur sommet*, constamment très glabres.” (l.c.)

III. A. Cunningham, in his “Precursor of New Zealand Botany,”²⁷⁸ quotes entire, with apparent approval, Richard’s specific description, and that without any addition of his own, A. Cunningham having also detected this fern at the north, “in dry woods at Whangaroa,” in 1827; and, subsequently, his brother, R. Cunningham, “in similar situations in that locality, in 1834.”

IV. Sir W.J. Hooker also, in his more fully and specifically describing *Pteris (Litob.) macilenta*, says: “... pinnæ and pinnules *remote alternate*, ultimate pinnules *small* (1–3 inches) *ovate* [221] or *deltoid*, cuneate at the base petiolate, pinnatifid, terminal ones elongate acuminate, *lobes oblong* or *ovate* acute, coarsely inciso-serrate *at the apex*, basal veins forming a single arc and 2 or 3 large areoles on each side of the costule of the segments, the *rest of the veins free*;” and again, he says, “the pinnules are *small*, and there are but *few* areoles, and those confined to the costa and costule (*not extending to the apex of the latter*), *the rest of the veins are free*.” (l.c.)

V. Sir J.D. Hooker also, says, in his greatly enlarged specific description of *Pt. (Litob.) macilenta*,²⁷⁹ “*Venis rarius furcatis nunc basi anastomosantibus. Soris sinubis latis continuis*;” and, further on, “pinnules ... the *lobes oblong*, sharp, sharply coarsely toothed *towards the tip*.

278 WC: “Companion, Botanical Magazine,” vol. ii., p. 365.

279 WC: “Flora N.Z.,” vol. ii., p. 26.

Sori *continuous in the hollows.*" And in his still later work ("Handbook N.Z. Flora," p. 364), he says, "Costa *flexuous*, pinnules scattered . . *ovate-oblong*, veins *forked, netted towards their base only*. Sori *in the notches broad.*" And this statement of his, twice repeated, viz., "soris *sinubis latis continuis*;" and, "sori *in the notches broad*," agrees not only with Richard's figure, but most particularly so with his magnified dissections of the sori and their *broad involucre covering them*. And to this may also be added Baker's remark on this fern, "Rhachis *flexuose*, veins fine, not anastomosing much except the costal arches." ("Synops. Fil.," p. 171.)

I have observed (*supra*) that this fern, *Pteris* (*Lit.*) *pendula*, is more nearly allied to *Pt. (Lit.) macilenta*, of all our New Zealand ferns. It is, however, also pretty closely allied to *Pt. (Lit.) endlicheriana*; and so serving, as it were, as an intermediary to unite in a still more natural sequence the New Zealand and South Pacific ferns of the *Litobrochia* section of the *Pteris* genus. I may further notice that this fern is also very near to the *Campteria* section of that large genus, from which it only differs in its outer veins being branched as well as forked; while its excessively narrow involucre allies it equally with the *Platyloma* section of the closely allied and scarcely distinct genus *Pellaea*: indeed, it seems in all its characters to unite all four sections, *Eupteris*, *Campteria*, and *Litobrochia*, of the genus *Pteris*, together with *Platyloma* of *Pellaea*.

Having stated this, I may also quote here a similar observation made by Sir "W.J. Hooker on another of our New Zealand ferns and its compound venation, *Pt.*

incisa, viz.: “We shall find that one well-known species (*Pt. incisa*) unites in itself three kinds of venation, that of true *Pteris*, of *Campteris*, and *Litobrochia*; and other species present quite intermediate characters.” (“Sp. Fil.,” vol. ii., p. 207.)

My mentioning *Pt. incisa* reminds me of what A. Richard had also said of that fern, in his original description of [222] *Pt. macilenta* (already in part quoted, *supra*), viz.: “Cette espèce s’approche un peu du *Pteris vespertilionis* de M. Labillardière,²⁸⁰ mais néanmoins elle en est fort distincte.” (*l.c.*) This observation of his is the more valuable here, inasmuch as he had just before said of *Pt. macilenta* that at first sight it more resembled a species of *Lindsæa* than one of the genus *Pteris* (*supra*). And why so? What was it in particular that called forth that double remark, as it were, at that one time respecting this fern, *Pt. macilenta*? I only know of one striking character (or, at most, two) that could have led to it—viz., the lobes being large with their margins entire, and the involucrum broad and continuous. The figure of *Pt. vespertilionis*, as given in Labillardière’s large work,²⁸¹ now before me, (which very likely Richard had also before him at the time of his writing,) bears out this supposition, as the lobes of the pinnules are all remarkably entire and free from the least amount of incision or denticulation, not having any even at their tips.

280 WC: This fern is, more recently, said to be identical with *Pt. incisa* of Thunberg, an earlier discovered African and Indian fern; hence the priority of that name.

281 WC: “Novæ-Hollandiæ Plant. Spec.,” vol. ii., tab. 245.

In conclusion, I may further mention that I have noted the very much larger size of *Pt. macilenta* ("5 feet high") as given by Hook.f. and Baker, when compared with that given by Richard; but I may say that I have also seen such large specimens of *Pt. macilenta* in the dry woods at the north; yet, while possessing such very much larger fronds, it still preserved its peculiarly distinctive and striking characters of small ovate and distant pinnules: which unique specific appearance had caused Sir W.J. Hooker to say respecting it: "It were a great blessing if all *Pterises* were as distinct as this. It is difficult to say which are its near affinities." (*l.c.*, p. 220.)

Genus 16. Lomaria, Willdenow.

1. *L. paucijuga*,²⁸² sp. nov.

Plant small; caudex (specimen, a top broken off) ascending, 1 inch long, hard and woody, as thick as a common lead pencil, with several old stipites and scales on it below the living fronds. Fronds (4, all sterile,) sub-opposite, or tufted, erect, equal, uniform; lamina herbaceous, olive-green, ovate, sub-acuminate, 3 inches long, 1½ inches broad, pinnatifid; lobes, 4–5 pairs, short, opposite, oblong, 9 lines long, 5 lines broad, very obtuse, spreading, rugulose, close and slightly overlapping, glabrous (not glossy) on upper surface, largely and finely pilose on under-surface and on rhachis; hairs hyaline, jointed; margined, puckered, much veined; veins conspicuous, branched, extending [223] to margin, clavate, red; margins white, cartilaginous and recurved, undulate and slightly crenulate-denticulate, closely

282 *Blechnum vulcanicum* (Blume) Kuhn.

ciliate; the lowest pair of lobes cut nearly to rhachis and shorter than the pair above them, and much broader in the lower basal portion, which is cordate sub-auricled and divergent; the upper lobes cut about half-way to rhachis; the terminal lobe large, broad, sub-ovate-acuminate, the base once crenately lobed, tip truncate. Stipes 3 inches long, channelled (also rhachis), flexuous; the upper part very slender, almost filiform, straw-coloured, finely hairy, hairs patent; the lower portion much compressed, flat, dark-brown, sub-scaberulous. Scales subulate-lanceolate, much acuminate, $\frac{3}{4}$ inch long, red-brown, glossy, finely striate; margins slightly and distantly denticulate; cells numerous, linear-oblong.

Hab. Sides of Mount Tongariro, County of East Taupo; 1887: *Messrs. Owen and Hill.*

Obs. This species is peculiar, inasmuch as it is scarcely allied (or, if so, not closely) to any one of our known New Zealand species of this genus, including also the Australian ones with those of the neighbouring islands. In its soft herbaceous texture it approaches *L. nigra*; in its pilose character (slightly) *L. vulcanica*; in the position and shape of its lobes (but again only very lightly) *L. discolor*; perhaps its nearest ally is *L. vulcanica*, but from that species it differs considerably in several characters—as in size, colour, texture, cutting and shape of frond and lobes (particularly the lower pair of lobes and the terminal ones), in venation which is much branched throughout, especially in the terminal lobe, (and this character alone is a rather unusual one in this genus, although it obtains in a lesser degree in *L. nigra*,) and in its slender compressed stipe, and red-brown (not “black”)

scales. Unfortunately a fruitful frond has not been seen, and my only specimen appears to have been broken off at some distance above ground, being quite clean and free from earthy particles.

2. *L. aggregata*,²⁸³ sp. nov.

Rhizome (underground) long, 2–3 inches or more, narrow, woody. Root-stock (above ground) 1–2 inches, with many stipites and numerous blackish subulate scales; rootlets brown, long, fibrous, hairy, much branched; several perfect plants growing in separate tufts or heads from one root-stock. Plant small, tufted; fronds erect, spreading, 4–6 inches high, linear-lanceolate, pinnate, membranaceous, glabrous, green inclining to pale; stipes various lengths, $\frac{1}{2}$ –1 inch (sometimes, but rarely, 3 inches), very slender, channelled, minutely and thickly papillose, reddish-brown, scaly below at bases: sterile frond 3–5 inches long, 6–9 lines wide, pinnato-pinnatifid, the green lamina completely severed to rhachis (merely the extremely narrow [224] white subcartilaginous translucent margin remaining, and so throughout); segments alternate sometimes opposite, free but close, sinuses broad, broadly oblong, (sometimes broadly deltoid, the upper margin horizontal, and apex very obtuse,) 2–4 lines long, sessile with a broad base extended upwards and decurrent, tips rounded; the lower segments small and semi-orbicular, sometimes narrow lunate; the terminal lobe ovate, obtuse; margins entire, slightly sinuate, narrowly cartilaginous, minutely and sharply serrulate (*sub lente*) at tips of veins with 2–3–4

283 *Stet?*

microscopical teeth close together; midrib not extending to tips; veins few, pinnate, 4–5-jugate, simple and forked, extending to margins, slightly clavate: fertile frond, 2 inches shorter and narrower, the stipe usually longer, pinnæ few, alternate and opposite, 2–3 lines long, narrow-linear, much falcate or curved upwards, distant, sessile, and largely decurrent on rhachis; tips obtuse and mucronate; the ultimate lobe long and very narrow. Involucre narrow, not extending to tips, at first incurved, afterwards recurved and everted, margin entire. Sori brown, profuse, covering midrib and rhachis also when lobes opposite.

Hab. Sides of streams, and watercourses in low gullies, forests about Danneverke, County of Waipawa; 1887: W.C.

Obs. I. This little fern is closely and naturally allied to some other of our small *Lomariæ*: as *L. lanceolata*, Spr., *L. membranacea*, Col., *L. pumila*, Raoul, *L. oligoneuron*, Col., and *L. intermedia*, Col.²⁸⁴ but, as I take it, (after long and close comparison and study of the plants in their living state,) is very distinct from them all in several characters, yet forming with them a pleasing kind of natural sequence. At the same time, with Sir W.J. Hooker, I feel obliged to remark on the great and increasing difficulty or impossibility of making real distinctions and differences in allied ferns clearly known without accurate drawings.

II. I have described it as “pinnate,” (and have given my reason for doing so,) other botanists may deem it to be

284 WC: “Trans. N.Z. Inst.” vol. xix., p. 274.

pinnatifid; it is just one of those ferns that (to use Sir W.J. Hooker's words) "might with equal propriety be called pinnatifid or pinnate." ("Ic. Fil.," on tab. cxl.)

III. It grows plentifully in those habitats mentioned above; and with it, just as plentiful, its congener *L. lanceolata*, of various sizes. And while, at first sight, the skilled observer is liable to confound the two plants, (as I myself did,) yet he soon learns to distinguish them, even at a short distance.

3. *L. parvifolia*,²⁸⁵ sp. nov.

Fronds (sterile) including stipes, 7–9 inches high, 4–5 lines [225] broad, linear-lanceolate, slender, weak, drooping, pinnatifid cut nearly to rhachis but the green lamina entire, membranaceous, glabrous, shining, pale-green with a reddish tinge; segments sub 30-jugate, symmetrical, alternate, distant, sinuses large, oblong, 1½ lines long, 1 line broad, obtuse (sometimes sub-acute from the tip of a vein); the ultimate lobe rather large, confluent, obtuse, margins entire and sub-sinuate from tips of veins, segments very distant below and sub-pinnate, bases extending upwards and decurrent; midrib flexuous, evanescent; veins very few, pinnate, 2–3-jugate, simple, prominent, extending to margin, their tips thickened, brown. Stipes very long, about half the length of the whole frond, very slender almost capillary, flexuous, finely channelled above, dark-red-brown, glossy, with a few short, sub-orbicular thin reddish scales at base.

285 *Blechnum penna-marina* subsp. *alpina* (R.Br.) T.C.Chambers & P.A.Farrant.

Hab. High slopes of Tongariro Mountain Range, County of East Taupo; 1887: per *Mr. H. Hill*.

Obs. This is a most peculiar species; its long, narrow, slender, small-leaved fronds differ widely from all its congeners known to me. Unfortunately I have not seen a fertile frond, but have received several barren ones entire, and they are nearly alike. Apparently the plant is of cæspitose growth. Perfect specimens of this little species are much desired.

4. *L. fluviatilis*, Sprengel; var. *ramosa*,²⁸⁶ Col.

Plant similar to *L. fluviatilis* (as found here and in the hilly interior of the North Island), large, gregarious, forming thick beds or patches; caudex stout, 4–6 inches high, coalescent of many stipites. Stipes 4–7 inches long, rather slender, very scaly throughout (as also rhachis) with long red glossy scales. Fronds linear-lanceolate, 2 feet 3 inches to 2 feet 6 inches long, 1–1¼ inches broad, pinnate, membranaceous, light-green. Sterile fronds: spreading, somewhat decumbent, pinnæ 50-jugate, distant, orbicular, and oval with broadly rounded tips, ½ inch long, slightly narrowed at base, sessile, patent; midrib not extending to apex; veins pinnate, prominent, forked; margins cartilaginous, white, denticulate, recurved; the uppermost lobes very small and pinnatifid, confluent at tip; forked and branched near the top; branches 4–6 inches long, dichotomous at tips, branchlets 1–2½ inches long, very narrow; pinnæ as on rhachis but much smaller and gradually reduced in size, minute at apices; sometimes the extreme tips of the branchlets bear

286 *Blechnum fluviatile* (R.Br.) Salomon.

long narrow fruiting lobes or pinnæ; and sometimes their tips are corymbose-crested and much dilated,²⁸⁷ with their lobes close and imbricated; more rarely a single narrow linear obtuse leaflet, or lobe, 2 inches long, is produced from the main rhachis at the [226] base of a branch. Fertile fronds: the pinnæ are shorter, narrower, and more distant on rhachis than in *L. fluviatilis*; they are also forked and dichotomously branched near their tops; branches 6–7 inches long, very narrow, flexuous, and curved; the pinnæ small, 2–4 lines long, very numerous. Sori copious; involucre large, laciniate at margins; brown, very cellular.

Hab. Dry forests near Norsewood, County of Waipawa; 1882–86: W.C.

Obs. I. I have long known this pretty variety of *Lomaria* (for such I deem it,) and have, also, shown specimens of it at the meetings of our Society; and for some time have been undecided whether to describe it as a *sp. nov.*, or only as a variety of *L. fluviatilis*. I was the more inclined to make it a *sp. nov.* from the manner in which Raoul and other botanists have described *L. fluviatilis*, (*L. rotundifolia* of Raoul,) including also their drawings of that plant, evidently showing it to be a much smaller and shorter yet wider-fronded fern; but, on the other hand, there was also my own still earlier description²⁸⁸ of it

287 WC: As shown in *L. spicant*, var. *ramosum*, Moore: Lowe, "New and Rare Ferns," plate xxi.

288 WC: I first met with this fern in "December, 1841, in humid woods near Waikare Lake, North Island;" and an early description of it (with others) was published in 1842, in "The Tasmanian Journal of Natural Science," vol. i., p. 377, under the name of *L.*

than Raoul's; which, in the main, agrees with this, the large *L. fluviatilis* of our Hawke's Bay and interior forests.

II. M. Raoul discovered his fern at Akaroa (South Island), and describes it fully as a *sp. nov.* In his description he says:— “Frondes confertissimæ, breviter stipitatæ, oblongolanceolatae; 2–2½ decimetr. longa. Pinnæ (v. lobi) 14–20.” (*loc. cit.*, p. 9.) And his drawing of a small fern, in his folio work, agrees with his description.

III. Sir J.D. Hooker also, in his “*Flora Tasmaniæ*,” gives a similar drawing, though a little larger, of the Tasmanian plant, with very short and almost glabrous stipes, and glabrous rhachises. In his description he says: “Fronds 8–18 inches high, with very short stipes,” etc. In my description, I had said, “This fern in its native forests presents a very graceful appearance. It there attains a large size, some fronds having been observed between 2 and 3 feet in length. The fertile fronds, generally 3 in number in each plant, are invariably very erect, ascending directly from the centre; while the numerous barren fronds, spread out horizontally in a half-

rotundifolia, Col. M. Raoul was also in the spring and summer of that same year (1841), at Akaroa, South Island, where he detected his fern; and again there in 1842–43, returning to France in August, 1843; and soon after he published his “*Choix de Plantes de la Nouvelle-Zélande*,” in which he, too, knowing nothing of mine, named his fern *L. rotundifolia*, Raoul. Sir W.J. Hooker, however, in his “*Species Filicum*,” subsequently published it as being the *L. fluviatilis* of Sprengel, who I fancy had never seen a New Zealand specimen of it, but only a Tasmanian one—viz., the *Stegania fluviatilis* of R. Brown.

procumbent [227] manner, enchant the eye of the observer with a most elegant circle of delicate and ever-living green" (*loc. cit.*).

IV. Those two ferns (the New Zealand South Island and Tasmanian ones) are very dissimilar at first sight from our Hawke's Bay, North Island, one; but on close investigation they are not, I think, specifically distinct. It is, however, a pity that we have only drawings of such small dwarfish specimens to represent our tall, fine, and graceful fern—certainly the most handsome of the genus inhabiting New Zealand.

Genus 18. *Asplenium*, Linn.

§ A. EUASPLENIUM.

1. *A. melanolepis*,²⁸⁹ sp. nov.

Plant small, tufted, erect, 10–15 fronds; with numerous small erect subulate black scales at extreme bases of stipites, growing like a little fringed crown among them; roots many, rather short, wiry, chestnut-brown, hairy. Stipes $\frac{1}{2}$ –3 inches long, red-brown, glossy, rather slender (sometimes filiform), brittle, sub-cylindrical, flattish on upper surface, narrowly margined (also rhachis), with a few scattered weak brownish scales near base. Fronds linear-lanceolate, pinnate, 4–7 inches long, 4–6 lines wide (at broadest part), flexuous, spreading, green inclining to pale; pinnae 20–30 pairs, small, 2– $2\frac{1}{2}$ lines long, 1– $1\frac{1}{2}$ lines broad, decreasing gradually in size to apex, terminal pinnae not confluent; petiolate and distant throughout, very distant and minute below, mostly opposite and sub-opposite sometimes alternate, sub-

289 *Asplenium trichomanes* L.

coriaceous and opaque, margined, margins slightly recurved; generally of two principal forms on a frond, (1) those below sub-orbicular-flabellate and rhomboidal, their outer margins pretty regularly bluntly crenate, and their upper and lower basal margins nearly equal; (2) those above sub-obovate-oblong and narrow-oblong, their sides very unequal, the lower margin nearly straight and entire, the upper curved, slightly and irregularly crenulate, and abruptly excised at base, their tips truncate and crenate; veins 3-nerved, flabellate in lower pinnæ; in upper pinnæ few, almost obsolete, with scarcely a midrib; tips very slightly clavate and not extending to margins. Sori near margin but irregular in position and in size, form, and number,—1, 2, 3, 4, or 5 on a pinna,—sometimes a single globose cluster (like *Polypodium*), and sometimes confluent, filling the under-surface of a pinna; often the smaller oblong pinnæ contain the larger number of sori. Involucre linear, narrow, white, persistent, margin entire. Scales subulate, 3 lines long, much acuminate, flexuous, with a thick central black nerve and largely reticulated membranous margins; cells large, their walls thick and black. [228]

Hab. Among crags on the summit of the high hill Pukekotuku, near Puketapu, County of Hawke's Bay; 1859: W.C. Petane Valley, north of Napier, same county; 1881: *Mr. A. Hamilton.*

Obs. I. This fern is pretty closely allied to the two well-known British species *A. trichomanes* and *A. viride*; also, (though more remotely) to the New Zealand species *A. flabellifolium*, and it naturally belongs to the same section and group (*Euasplenium*); but, while it possesses

a very strong sectional likeness, it is very distinct from them all in several grave characters—as colour of frond and stipe, shape, size, substance and position of pinnæ, their peculiar venation, the form and place of sori, and their small, narrow, and persistent involucre, and the highly curious basal scales.

II. I have long known this plant, and, though I have several times taken it up for examination, I set it aside, thinking it to be a variety of *A. trichomanes*, or of *A. viride*, or a hybrid between them and *A. flabellifolium*, if those two British species (*veræ*) were also denizens of this country. I have now, however, thoroughly and exhaustively examined this plant, having plenty of good specimens, and also standard drawings, with dissections,²⁹⁰ of those two British species (*supra*); and the result I have here given in my rather long and close description of this fern. With me, such an amount of differential and important characters, found, too, on so many specimens, settles the matter.

III. Some of my specimens of this fern are, to say the least of them, “sportive”—their rhachises largely forked at tips with a long terminal pinna; others possessing a few very long and scattered ligulate pinnæ, 8–10 lines long, but scarcely regular enough to be deemed a variety.

290 WC: I may especially mention (for drawings, etc.,) Sir W.J. Hooker's “British Ferns;” Sowerby's “English Botany;” Newman's “British Ferns;” Bentham's “British Flora;” and Beddome's “Ferns of South and of British India;” also, for additional descriptions, “Species Filicum,” Hooker; “Synopsis Filicum,” Baker; and the description of *A. trichomanes* in “Flora Australiensis,” etc.

2. *A. flabellifolium*, Cav., var. *ramosum*,²⁹¹ Col.

Plant tufted, 6–9-fronded, prostrate, spreading. Stipe light-green, slender, glabrous (also rhachis), 2–5 inches long. Frond dark-green, pinnate, main rhachis 10–14 inches long, subflexuous, branched above; tips long, filiform, naked, proliferous; branches very slender, straight, 4–7 inches long; pinnae petiolulate, free, alternate, (the lowest pair opposite,) 18–24 on each side of main rhachis, 3–8 lines long, 2–5 lines broad, of various sizes and shapes:—(1) broadly deltoid, and 3-lobed ovate or [229] bluntly sub-hastate with very obtuse rounded tips: (2) quadrilateral: (3) trapeziform: (4) ovate-acuminate with proliferous tips,—their margins sharply toothed, the posterior lower base excised, sometimes both; midrib flexuous; veins pinnate; veinlets simple and forked, vanishing at tips and not extending to margins; trinerved in the broadest pinnae. Sori numerous, biserial, 3–6 pairs on a pinna, nearer costa than margin, opposite, oblique, distinct not confluent, sometimes an additional smaller sorus, or even 2, on auricle of larger pinnae. Involucre pale, rather large, adpressed, sub-lunulate-linear, finely reticulated (*sub lente*), margins entire but slightly sub-sinuate. Capsules large brown shining, not numerous, scarcely appearing from beneath open margin of involucre.

Hab. Woods near the town of Waipawa; 1882: *Mr. A. Hamilton.*

Obs. A striking variety of a well-known and elegant New Zealand fern; peculiar in its branching and in its highly

291 *Asplenium flabellifolium* Cav.

abnormal and varied pinnæ on the same frond; and still further differing from *A. flabellifolium* in the disposition of its veins and sori.

Genus 20. Nephrodium, Br.

§ EUNEPHRODIUM.

1. *N. inaequilaterum*,²⁹² sp. nov.

Rhizome subterranean, long, creeping, flexuous, woody, sub-angular-cylindrical, as thick as a common lead pencil, with many rootlets, blackish. Vernalation erect, uniserial, distant 1–1½ inches on rhizome. Stipes 6–7 inches long, rather stout, sub-cylindrical, channelled above, (as, also, rhachis and sub-rhachises,) straw-coloured, blackish at base, glabrous. Fronds, 5–8 (rarely 9–10) inches long, 3–6 inches broad at base, ovate and sub-deltoid-ovate, acuminate, sub-membranaceous, green, glabrous, somewhat glossy, with a few small broad inflated brown scales scattered on rhachis and sub-rhachises; pinnate, pinnæ few 8–12-jugate, opposite, free, not close, very distant below on rhachis, 1–1½ inches apart, the lowest pair of pinnæ very little shorter than the pair above, petiolate, linear-lanceolate-acuminate, 2–3 inches long, 4–5 lines wide, tip acute, spreading, straight, sometimes approximate, pinnatifid, one-third cut to rhachis; lobes small, regular, attenuated, sub-deltoid, unequilateral, the lowest posterior basal lobe wanting as if the pinna was excised; tips falcate or curved with a small mucro; midrib flexuous; margins entire, slightly cartilaginous, white, recurved; the terminal pinna 2 inches long, its lobes larger than those of pinnæ, tip very

292 *Cyclosorus interruptus* (Willd.) H. Itô.

acuminate. Veins of lobes conspicuous, translucent, reddish, pinnate, 6–7-jugate, curved and extending to margin, besides the lowermost vein which [230] starts from extreme base of midrib on the anterior side and makes an angle with a much shorter vein that meets it from sub-rhachis of pinna on the posterior side directly under the sinus, and so forming a costal anastomosing unequilateral venule between the lobes, enclosing a narrow triangular costal areole; the lower (or 2nd) pair of basal veins scarcely meet at the sinus, usually appearing at the margins just above it, to which also a long straight veinlet is carried from the outer angle of the said costal areole. Sori many, nearer margin than midrib, sub-marginal, close, confluent in age, occupying lobes from tips to far below sinus and nearly to sub-rhachis, unequal in number on a lobe, usually 6 on one side and 7 on the other, much more numerous (8–10 pairs) on lobes of the terminal pinna, also on upper smaller pinnæ. Capsules profuse, dark-brown, glossy. Involucre large, persistent, sub-orbicular-quadrata, somewhat dilated, membranaceous, white at first becoming brown in age, shining, closely filled with many dark crinkled veins; margins much sinuate, ciliated; ciliæ jointed.
(Resembling those of *N. funestum*, Hook., and *N. squamigerum*, Hook. and Arn.: "Sp. Filicum," vol. iv., tabs. 259, 270.)

Hab. Woods near Tapuaeharuru, County of East Taupo; 1872 (received from a visitor): Wairakei, same county; 1887: *Mr. C. J. Norton.*

Obs. A few years ago I received several fronds of this fern from an acquaintance, who was sojourning for his

health among the hot baths in the Taupo District; but unfortunately they were all barren. At the time I thought the fern would prove distinct from any known and published ones; at all events, they were then new to me. Recently, however, through the kindness of Mr. Norton, I have received several fruiting specimens, and I now find them, after long and close examination, to be as I had supposed. The fern, however, is not wholly new to collectors and others, it having, I believe, commonly passed with them as *N. unitum*, Sieb., from which species, although allied, it is certainly quite distinct, and that in several characters: as in its very much smaller size and different shape; the pinnæ few, petiolate, distant and not contracted at base,²⁹³ their lobes [231] oblique and peculiarly unequal-sided; fewer veinlets, with only one basal pair uniting and forming a long narrow costal areole; sori also in unequal series on the lobes; and the involucre large, persistent, differently shaped and ciliate. All these characters are the opposite of those of *N.*

293 WC: Sir W.J. Hooker says of *N. unitum*: "fronds 1–2 feet long, suddenly contracted and attenuated at the base by the dwarfing of the pinnæ there." ("Sp. Filicum," vol. iv., p. 81.) And this is also clearly shown by Beddome in his drawing of that species. Further, I am well aware of what Baker says ("Syn. Filicum," pp. 289–290) respecting the *N. unitum* of Sieb., and of Hook.; that it is a different fern from *N. unitum* of R. Br.; and he also gives separate descriptions of both, making of the former fern a distinct species, *N. cucullatum*, Baker. Moreover, this is supported by Clark in his more recent work, "Review of the Ferns of Northern India" ("Trans. Linn. Society of London," 1880; 2nd series, Botany, vol. i., part viii.), but all that makes no difference, as far as regards this New Zealand fern here described, as it is equally distinct from both.

unitum; as given respectively by Sir W.J. Hooker, Bentham, Baker, and Beddome; while the drawing of *N. unitum* with dissections ("Beddome's Ferns of South India," tab. 78) shows a very different plant. So also his drawings of other closely allied species, as *N. terminans*, J. Sm., *N. propinquum*, Br., *N. extensum*, Hook., and *N. pteroides*, J. Sm. (*loc. cit.*), all of them being also Australian ferns, and much nearer to *N. unitum* than any of them are to this species. Having had plenty of good specimens, and that, too, in their fresh state, with ample works of reference at hand, I have, I trust, fully settled this inquiry.

Genus 21. *Nephrolepis*, Schott.

1. *N. flexuosa*,²⁹⁴ sp. nov.

Caudex subterranean, erect, 6–8 inches (or more) long, composed of a harsh somewhat woody flexuous rhizome, some broken stipites and many long wiry rigid branching and spreading glossy rootlets; vernation fasciculate. Stipes 3–6 inches long, semi-terete at top, cylindrical at base, slender, brittle, reddish, glossy, hairy. Fronds erect, mostly 12–20 (sometimes 23–26) inches high, linear-lanceolate, attenuated above and below, tip acute; rhachis slender, channelled above, brown, shaggy with long flexuous red fimbriate scales or compound hairs; pinnate, usually 1–1¼ inches wide (sometimes 1½–1¾ inches) at the widest part, green, glabrous, glossy, with cretaceous dots on upper surface directly over the clavate tips of veins; pinnae varying in number on a frond from 60 to 100, and even to 140 (rarely) on each side of rhachis, ½

294 *Stet.*

inch long, 2–2½ lines wide, alternate, distant (sometimes close-set), obliquely-oblong, tips broad; very small above at apex, small and orbicular and very distant at base; patent, upper margin straight sometimes very slightly curved; midrib dark-coloured, flexuous, not reaching to apex of pinna, sub 3-branched at base; margins somewhat crenate-incised with few distant irregular incisions, their outer edges straight; tips rounded crenate; anterior base of pinnæ largely auricled upwards, auricle cordate, rounded, entire and imbricating rhachis, its margins recurved; the posterior base scarcely sub-cordate, often slightly excised; petiolulate, the petiole inserted in an oval excavation in the epidermis of the rhachis, with additional hairs at the junction. Veins rather obscure, few, free, 12–16-jugate in larger pinnæ, bases dark as midrib, forked only, not extending to margins; tips orbicular, clavate. Sori large, biserial on the [232] upper part of pinnæ on the anterior veinlets, nearer margin than costa, always more in the upper row, usually 7–5 (5–3, and so on), the uppermost pinnæ with sori in one row only; capsules small, dark-coloured, on very long pedicels. Involucres of various shapes—reniform, lunate, and hippocrepiform, persistent, very membranaceous, whitish, finely reticulated with dark veins, transparent, glossy, margins entire and sinuate, opening towards apex, of pinna, except 2 (sometimes 8) basal ones in the upper row which open towards lateral margin. The compound scales or flattened hairs on the rhachis are very peculiar, brown, sub-ovate and largely fimbriate at base, with long curly white tips, their basal fimbriæ also very curly.

Hab. Banks of a hot stream at Tapuaeharuru, near Taupo township; and in the neighbourhood of hot springs at

Wairakei, near the River Waikato, west bank; both places in the County of East Taupo; 1887: *Mr. C. J. Norton.*

[My first specimens I received from the interior (exact locality unknown), in 1861: W.C.]

Obs. I. I have known this fern for several years (26), but only from imperfect specimens, yet I ever doubted it being *N. tuberosa*, Presl. Lately, however, I have received a quantity of good specimens from Mr. Norton, and now, after a prolonged and close examination, aided by the works of our first pteridologists, I feel assured that it is a different species from *N. tuberosa*, Presl., as that fern is described and figured by them.

II. The latest critical authority on Indian ferns known to me is Mr. G. B. Clarke ("Trans. Linn. Soc., 2nd series, Botany," vol. i.), who both describes *N. tuberosa*, Presl., (*l.c.*, p. 540,) and refers to Beddome's figures of it ("Ferns of Southern India," tab. xcii.); the fern there figured and dissected is utterly unlike this one described by me,—in outline, in size and shape and cutting of pinnæ, in midrib and venation, and in sori. J. Smith ("Ferns Brit, and For.," p. 164,) refers to "Lowe's Ferns," vol. vii., tab. 25, for *N. tuberosa*, Presl.; that figure too, is very far from this fern. I cannot reconcile Bentham's description of *Aspidium (Nephrolepis) cordifolium* = *N. tuberosa* of authors, ("Flora Austral.," vol. vii., p. 754,) with this New Zealand fern; neither does it agree with Swartz's brief description of *Aspidium cordifolium*, with which fern Bentham has united it. In Sir W.J. Hooker's carefully detailed specific description of *N. tuberosa*, Presl., ("Sp. Fil." vol. iv., p. 151,) I find grave differences of character, distinguishing it from this fern. Of that fern

he says: "fronds *glabrous*, pinnae *crenated*, auricle *acute*," [as also shown in Beddome's figures,] "sori *equidistant*, opening *towards apex* of pinna, involucre *reniform* nearly *half-moon-shaped*, *firm*, *coriaceous*, base *black*," etc. And Baker ("Syn. Fil.", p. 300,) says of *N. cordifolia*, Presl.: [233] "rhachis *slightly scaly*, involucre *firm*, *distinctly reniform*," etc. To which I would add Moore's remark on *N. tuberosa*: "Indusium *reniform* affixed by its *oblique arcuate base*;" which, also, his figure of it shows. ("Ind. Fil.", p. xc.; tab. 72, B. 5.) All those characters do not agree with these of this species (*vide descr.*), besides other positive important ones peculiar, to it. Lowe (*l.c.*) gives no less than eight plates of as many distinct species of *Nephrolepis*, all differing from this one; the nearest, however, of them to it is *N. pectinata*, Schott (tab. 18,) but only in a distant resemblance. I notice this species is made by Baker (*l.c.*) a var. β of *N. tuberosa*, Presl.

III. As the species of *Nephrolepis* described by Sir J.D. Hooker²⁹⁵ is in the same characters (abbreviated) as in "Sp. Fil." (*supra*), it is, of course, a different species from this one, and it was obtained from a very different locality in New Zealand; so we now possess two (or more) species of this small genus²⁹⁶ three (or more) species are known from Australia.

295 WC: "Handbook N.Z. Flora," p. 379.

296 WC: Sir W.J. Hooker gives six species. ("Sp. Fil."); Baker gives seven ("Syn. Fil."); Lowe (as we have seen) gives plates of eight, and mentions others; and J. Smith ("Hist. Fil.") gives twelve species of *Nephrolepis*.

Genus 22. *Polypodium*, Linn.

1. *P. (Groniopteris) subsimilis*,²⁹⁷ sp. nov.

Caudex erect, 1 foot to 1 foot 6 inches high, rather slender, coalescent. Vernation fasciculate, many fronds together, sub-erect, free, spreading. Stipes 2–3 inches long, rather slender, very scaly; scales large, ovate, cordate, peltate, obtuse, brown, 2–3 lines long, with large hexagonal cells. Fronds 10–12 (rarely 16) inches long, 4 inches broad at middle, oblong-lanceolate, pinnate, membranaceous, dull-green blotched with red, somewhat glossy above in a longitudinal line along centre of pinnæ, rhachis slender, deeply channelled above, reddish, very hairy (also sub-rhachises, costæ, and veins); hairs short, with scattered broadly-ovate adpressed brown scales on rhachis, sub-rhachises, and veins below; pinnæ petiolate, free, opposite, rather distant, horizontal, spreading, sub-linear-lanceolate, 2 inches long, 4 lines wide, broadest at base, tips acuminate, acute; pinnatifid, cut $\frac{2}{3}$ -rds to sub-rhachis; lobes narrow-oblong, obtuse; margins entire, slightly cartilaginous, ciliate; ciliæ red; the basal pair of lobes on sub-rhachises much larger and pinnatifid, their veins bipinnate; the lowest 3–5 pairs of pinnæ much shorter and broader, ovate, obtuse, 1–1 $\frac{1}{4}$ inches long, $\frac{3}{4}$ inch wide at base, each pair about 1 inch apart on rhachis. Veins prominent below, pinnate, simple, usually 7–8 pairs in a lobe (5–6 pairs only in the lobes of lower short pinnæ), the lowest veinlet uniting with the opposite one and both sending out a [234] straight veinlet to the sinus; but in the lobes of the upper pinnæ the lower pair of

297 *Pneumatopteris pennigera* (G. Forst.) Holttum.

veins are curved and barely meeting at the sinus. Sori small, reddish, nearer costa than margin.

Hab. Sides of streams, forests near Matamau, County of Waipawa; 1882–83: W.C.

Obs. I. This fern is nearly allied to *P. (G.) pennigerum*, Forst., with which, at first sight, it is likely to be confounded and taken for a small plant of that species; but a close examination reveals its difference in several characters—viz., the very much smaller size, narrower and slenderer in all its parts, its excessive hairiness, with peculiar large scales scattered on its frond, and the lobes ciliated; the pinnæ distant, very narrow and largely petiolate, with only the lowest veinlet of the lobes uniting, and the basal lobes large and pinnatifid with bipinnate veins. By some botanists, however, it may be considered as merely a variety of *P. pennigerum*, like two others (varieties) I have described.²⁹⁸

II. This fern is rather scarce, I having met with it in profusion in only one spot, where, however, were several low arborescent plants of it growing together, forming a little thicket or tangled brake, and certainly looking very pretty and neat.

298 WC: vars. *hamiltonii*, and *giganteum*, "Trans. N.Z. Inst," vol. xiv., p. 338, 339.

**1887 On new indigenous Cryptogams, of the
Orders Lycopodiaceæ, Musci, and Hepaticæ.
Transactions of the New Zealand Institute 20: 234-
254.**

[Read before the Hawke's Bay Philosophical Institute,
17th October, 1887.]

ORDER II.—LYCOPODIACEÆ.

Genus 2. *Lycopodium*, Linn.

**§ III. Leaves imbricated all round the stem. Spikes
terete, peduncled.**

1. *L. scopolosum*,²⁹⁹ sp. nov.

Plant small, erect, 2½–3 inches high, dichotomously branched, branches spreading. Main stem wiry, slender, rigid, ¾ inch long, bare; forked from underground (and without roots to specimens), the two lower branches also bare below for about ¼ inch each, twice forked above, each of the forkings again divided into 4 equal branchlets, sub 1 inch long, cylindrical and densely leafy throughout. Leaves somewhat sexfariously disposed, [235] closely adpressed, erect, imbricate, linear-acuminate, sub-cylindrical compressed, flattish on one side, convex on the other, 1½ lines long, pale yellow-green, shining; tips very long, acute and reddish. Peduncles terminal, single, erect, ½ inch long, slender, sub-cylindrical, striate, with a few yellow caudine bracts as long as leaves, narrow, ovate-acuminate, flexuous and squarrose, distant and scattered below, sub-vorticillate

299 *Lycopodium fastigiatum* R.Br.

(about 4 together) above. Spike 1 inch long, cylindrical, scales sub-peltate, sex-fariously arranged, very close and imbricate, ovate-acuminate, yellow with a blackish central stripe, adpressed below; veins closely anastomosing, apparent when held up between the eye and light; margins finely erose wavy and recurved; tips spreading squarrosely. Capsule wider than scale, orbicular-reniform, pale yellow.

Hab. Lava beds, base of Mount Ngaruahoe, County of East Taupo; "altitude 3,000 feet;" 1887: *Mr. H. Hill.*

Obs. I. This little plant is somewhat allied to *L. clavatum* var. *magellanicum* (of the "Handbook N.Z. Flora"), but differs from that species in its stem not being creeping below, and in not being fastigiately branched; in its small slender few-leaved (almost bare) peduncles, and in its scales being of a different shape, narrower and entire at their bases, etc.

II. *L. clavatum* var. *magellanicum*, is also said by Hooker (*loc. cit.*) to be identical with *L. pichinchense* (Hook. "Ic. Plant.," tab. 85), and, in "Flora of New Zealand," it is further said to be identical with *L. heterophyllum*, Hook., ("Ic. Fil." tab. 118). I have closely examined those drawings, and also that of *L. clavatum*, Hook. ("Brit. Ferns," tab. 49, and Sowerby's "English Botany," tab. 1451,) and find this plant to have no close affinity with them; in fact, to differ considerably in several characters. I have received three specimens of this plant, that are pretty nearly all alike in size and ramification, all dichotomously spreading; two of them being good fruiting specimens—one, 8-branched above and bearing 4 single spikes, and one, 6-branched with 2 single spikes.

2. *L. curvifolium*,³⁰⁰ sp. nov.

Plant, rhizome or main stem “creeping on the surface of the ground.” Stems erect, 10–12 inches high, slender, wiry, hard, whitish, distantly leafy, leaves somewhat subverticillately disposed; sparingly branched. Branches sub-erect, alternate, 3–5 inches long, sub-flabelliform, much branched above, very leafy throughout; branchlets dichotomous, slender, 2–8 inches long, sub-erect. Leaves loosely imbricating all round, flat, very narrow, linear-acuminate, 2 lines long, (larger ones on main stems 3–3½ lines long, very distant, and sub-appressed,) decurrent, spreading, patent, curved; tips ascending, acute. Spikes [236] terminal on main branches, panicled; panicles sub-fastigiate, 2–4-branched, bearing 3–8 spikes on long slender pedicels, that are sparingly leafy as on main stems, but leaves smaller; spikes usually 2 together, or 3, or only 1, sometimes bifid or forked, 1¼–1¾ inches long, very narrow, about 1 line wide, sub-cylindrical; scales quinquefariously disposed, imbricate, peltate, narrow-ovate-acuminate, brown on centre outside; margins waved, minutely denticulate; tips acute and obtuse, spreading. Capsule large, pale greenish-yellow, broadly and transversely oblong or sub-quadrilateral; valves, margins wavy and slightly erose. Spores white, semi-elliptic, roughish.

Hab. High lands, “altitude 2,000 feet,” north of Gisborne, County of Cook; 1887: *Mr. W. K. Chambers.*

Obs. This species has a very pleasing miniature tree-like appearance, somewhat resembling some specimens of

300 *Lycopodium fastigiatum* R.Br.

another New Zealand *Lycopodium*, *L. densus*, Labill., but more neat and finely cut, to which species it is also pretty closely allied. From that species, however, its larger more distant and less imbricated curved leaves, its longer and narrower spikes, which are also panicled, and mostly 2 or even 3 together on long slender pedicels, and its peculiarly-shaped capsule abundantly distinguish it.

§ IV. Leaves distichous. Spikes terminal, terete.

3. *L. distans*,³⁰¹ sp. nov.

Plant “creeping, spreading on surface of the ground;” main stems “long, rooting at nodes.” Secondary stems erect, straight, “4–6 inches apart,” 6–8 inches high, subcylindrical, slender, woody, irregularly and deeply channelled on the upper surface, leafy, much branched. Branches flat, spreading, subflabellate, tri-quadrifid; branchlets dichotomous, 2–3 inches long, $2\frac{1}{2}$ –3 lines wide; tips forked, divergent. Leaves distant throughout, (those on secondary stems very distant, 3–4 lines apart, sub 2 lines long, obtuse,) regularly disposed, alternate, coriaceous, glabrous, wrinkled, light-green on both sides, of two kinds: (1) the larger, patent, triangular, curved, falcate, tips acute, incurved, largely decurrent; (2) the smaller on under-surface only, sub-tristichous, the lateral ones arising from the decurrent bases of the larger leaves, the central from the middle of stems, linear-acuminate, sub 3 lines long, their bases appressed; tips acute, wavy, scarious, spreading, appearing above in the interspaces between the larger leaves. Peduncles very long, 2–4 inches, slender, erect, simple, forked,

301 Possibly *Lycopodium scariosum* G. Forst.

dichotomous and trichotomous, leafy; leaves or bracts long narrow, acuminate, erect, scattered, semi-appressed; tips spreading, scarios, membranaceous, jagged, acute. Pedicels 1–3, similar to peduncles, 1–2 inches long, spikes narrow, compact, [237] 1–1 $\frac{3}{4}$ inches long, 1–1 $\frac{1}{2}$ lines wide, tips obtuse; scales broadly deltoid acuminate, their centres green and somewhat turgid, margins yellow, membranaceous, denticulate and wavy; tips long, acute, patent, decurved, their edges finely serrate-cut. Capsules yellow, broader than scales, margins sub-sinuate, entire, the inner valve larger. Spores white, orbicular and sub-orbicular-cordate, much echinate, their trilateral suture strongly marked.

Hab. High lands, County of Cook, with preceding; 1887:
Mr. W. K. Chambers.

Obs. I. This is a fine stout leafy species; it has near affinity with *L. scariosum*, Forst., (also a New Zealand *Lycopodium*,) but differs from that species in several particulars: as in the tips of its branchlets being forked and divergent; in its more distant leaves that are also unicoloured; in the smaller ones (or stipules) being subtristichous, longer, and much more acute; in its very long peduncles; in its narrow and long spikes, with differently shaped acuminate scales, and broader capsules extending laterally beyond them; and in its globular echinated spores.

II. This plant, from its somewhat resembling at first sight *L. scariosum*, has caused me some considerable exercise in a series of long, close, and repeated examinations. Fortunately, I have received specimens of it in various stages and sizes, with, also, full descriptions of *L.*

scariosum by several celebrated botanists, and drawings with dissections by Sir W.J. Hooker of *L. scariosum*, Forst., var. *decurrens*, Br., and of *L. jussieui*, Desv., which two plants Sir J.D. Hooker says, in his description of *L. scariosum*, are identical with it ("Handbook, Flora N.Z."). There is, however, very little, if any, close affinity between those two drawings and this plant here described (or even between those two drawings themselves). Bentham ("Flora Australiensis") describes the spikes of *L. scariosum* as being "sessile, about $\frac{1}{2}$ inch long; bracts (or scales) in four rows," etc., agreeing with the figure of *L. scariosum* var. *decurrens*, Br. (*supra*), which species and name he also refers to as a synonym; but he does *not* retain *L. jussieui*, and, as I think, rightly, for they are apparently very distinct. I again have much pleasure in recording the able and ready assistance kindly rendered by Dr. W. I. Spencer, F.L.S., in examining and determining its spores.

Genus 4. *Psilotum*, Swartz.

1. *P. heterocarpum*,³⁰² sp. nov.

Plant terrestrial; rhizome hypogæous, shortly creeping, 3–4 inches long, slender, cylindrical, slightly branched with short thickish rootlets, hairy; hairs crowded, short, patent; clavate-tipped, [238] red. VERNATION erect, 7–9 inches high, sub-cæspitose, 6–10 stems rising nearly together, sometimes 3–4 stems uniserial and distant from a single rhizome; main stem stoutish, 1 line diameter, somewhat rigid, sub-cylindrical, bare of branches but much branched at top, leafless, with small scattered

302 *Psilotum nudum* (L.) P. Beauv.

linear obtuse scales about 1 line long, smaller and more numerous on branches. Frond 4–5 inches long, spreading, flabellate, dark-green minutely speckled with whitish dots, glabrous, glossy; branches largely dichotomous, sub-angular (as also branchlets); branchlets numerous, very slender, less than $\frac{1}{2}$ line wide, long, straight, spreading, flexible; tips truncate, retuse and slightly emarginate. Capsules rather numerous, alternate, lateral and peduncled, mostly on the middle branches (not below, rarely at the tops), very small, $\frac{1}{20}$ th inch diameter, sub-globose and slightly tri-lobed depressed, sometimes plain, also elliptic longer than broad, 1–2–3-and 4-celled, green at first (same colour as frond) and very glossy, orange-yellow when ripe, minutely dotted (*sub lente*), sometimes with 2 very small ovate obtuse lobes, or a minute bract, closely adpressed at base; peduncles short, about 1 line long, stout. Spores white, narrow oval.

Hab. Wairakei, Taupo, near the River Waikato, in ground heated by hot springs, among thick growing shrubs of *Leptospermum*, etc.; 1887: *Mr. C. J. Norton*.

ORDER IV.—MUSCI.

Genus 37. *Mnium*, Bruch and Schimp.

1. *M. xanthocarpum*,³⁰³ sp. nov.

Plant creeping, straggling; main branches 3–4 inches long, tips proliferous, hairy; branches sub-erect, $\frac{1}{2}$ –1 inch high, bare below and hairy. Leaves few, sub-rosulate at

303 *Plagiomnium novae-zealandiae* (Colenso) T.J.Kop.

tips of branches, oblong, obtuse (sometimes slightly retuse,) apiculate, 2½–3 lines long, (recurved and crisp when dry,) narrowly margined, margin entire but slightly uneven, sometimes minutely and sparsely denticulate towards apex, upper basal half free from stem of branch; nerve stout percurrent; dark-green, (pale in age,) subopaque; cells sub-orbicular-oblong with double walls, smaller and crowded at apex. Fruit-stalk erect, 15 lines long, stout, firm, yellow-green, base red, 1–4 growing together. Capsule oblong-cylindrical, 1½ lines long, subrugulose, horizontal and cernuous, yellow with dark orange rim at mouth. Operculum broadly conical, obtuse, much shorter than capsule, $\frac{1}{15}$ th inch long, minutely papillose, orange. Teeth, external, brown, with 4 longitudinal lines, the transverse bars in pairs; internal, pale brown with distant bars and 4–6 large areoles in each tooth, very acuminate, filiform and knobbed, tips flexuose; the intervening ciliæ single and forked above with long filiform knobbed tips. Calyptora not seen.

[239]

Hab. Wet shaded forests near Norsewood, County of Wai-pawa; 1886: *W.C.*

Obs. This species is closely allied to *M. novæ-zealandiæ*,³⁰⁴ Col., and also to *M. rostratum*, Schw., and *M. rhynchophorum*, Hook. From the former of those three species it differs in its smaller and dark-green leaves with narrower margins and small crowded cells at their tips; in its bearing 3–4 fruit-stalks, and its smaller and narrower capsule, which is also roughish, and yellow

304 WC: "Trans. N.Z. Inst.," vol. xviii., p. 225.

with an orange-coloured mouth; in its internal teeth being largely perforated, with long flexuous tips and their intervening ciliae only single and forked at top; and in its operculum being much shorter than the capsule, of a different shape, orange-coloured and papillose—all which differences also apply more or less to the two other species named above.

Genus 46. *Polytrichum*, Linn.

§ V. PHALACROMA, Hook.f. and Wilson.

(**Stem tall, fastigiously branched, dendroid.**)

1. *P. tongariroense*,³⁰⁵ sp. nov.

Plant erect, 8–10 inches high; stem long, simple below, much branched at top. Root (specimens) sub-horizontal, 1½ inches long, 2 lines thick, curved, densely covered with white wool. Stem slender, straight, and flexuous, 5–6 inches high, brown, glossy, triquetrous and regularly scarred below, clothed above with sheathing imbricated closely adpressed scale-like leaves, their vaginant bases large, oblong-quadrata, 1½ lines long, 1 line broad, very glossy, nerve stout, prominent on outside (not broad), excurrent and forming the aristate leaf, 1 line long, increasing in size upwards on stem to 2 lines long, curved, acute, very slightly serrulate (*sub lente*); the top or branched part 3–4 inches long, containing 15–17 alternate and distant branches; branches simple, 2–2½ inches long, sometimes the lower ones are forked near their bases, loosely spreading, leafy throughout. Leaves a pleasing green, very numerous, rather loosely arranged,

305 *Stet.*

wavy and curled (dry), the free part very narrow linear, $\frac{1}{2}$ inch long, $\frac{1}{50}$ th inch broad, tip acute, canaliculate on upper surface, the centre opaque with a stout narrow prominent nerve; margined; margins translucent, cells minute, orbicular, distinct; slightly serrulate, serratures increasing towards apex (almost entire about base), teeth sharp; the vaginant base large, shining, brown, 1 line wide, abruptly dilated quadrate, with a wavy crease at each side at top owing to the sudden expansion; margins of vaginant portion straight, [240] entire; cells oblong and distinct at the upper angles, but longitudinally linear and compact in the main part. Fruit unknown.

Hab. Ash-beds, base of Mount Ruapehu, Tongariro Range, "altitude 5,400 feet," County of East Taupo; 1887: *Mr. H. Hill.*

Obs. I. This fine species is near the large known New Zealand species, *P. dendroides*, Comm., but differs much from that plant in several characters—viz., in the number, size, and disposition of its branches, in its leaves being of a fresh light-green colour, longer, narrower and margined, with fewer, shorter and sharper teeth, and especially in the shape and larger size of their lower vaginant portion; in the stem-leaves being continuous imbricate and closely adpressed, with also large quadrate bases; and in its thick white woolly roots.

II. I have received several good specimens of this plant, and they are all very similar; unfortunately none bear fruit. This, however, is a common feature with those large dendroid mosses, and is often found to be the case with *P. dendroides*, *P. squamosa*, *Dawsonia superba*, etc. I have occasionally fallen in with large patches of these

mosses in the forests without detecting a single fruiting specimen. Indeed, both in Schwaegrichen's drawing with dissections of *P. dendroides*, and in Hooker's drawing of *P. squamosa* (discovered by him in Fuegia), there are no fruits given.

Genus 61. Isothecium, Bridel.

§ B. HYPNODENDRON.

(**Stem naked below, fastigiately branched above.**)

a. Capsule terete.

1. *I. heterophyllum*,³⁰⁶ sp. nov.

Stems stoutish, erect, 3–4 inches high, woody, dark-coloured (blackish-red), shining, scarred below, leafy above, base thickened with many fine dark-brown capillary rootlets; numerously and closely branched at top of stem, sub-umbellate, mostly sub-orbicular in outline, 2–2½ inches diameter; branches 1½ inches long, 3-pinnate, spreading, sometimes the lowermost pair of branches are very long and depending. Leaves pale-green, shining, sub-concave, of various shapes and sizes; cells narrow, linear, crowded, broader shorter and clearer at bases; margins not bordered: (1) leaves on upper stem large, broadly-ovate-acuminate, 1½ lines long, distant, transparent, spreading, dimidiate, their margins very slightly and distantly denticulate-serrulate; outer basal margin much rounded, sub-amplexicaul; tips piliferous, flexuous: (2) leaves on branches [241] sexfariously disposed, very close, crowded, imbricate, spreading, of three forms and sizes, (α) broad and similar to those on

306 *Hypnodendron kerrii* (Mitt.) Paris.

main stem but shorter, nerve red-brown; (β) ovate; and (γ) narrow-oblong, strongly nerved, nerve not percurrent, vanishing below apex, tip mucronate, upper margins sharply serrate, nerve at back near top serrate sub 6 teeth; the ultimate branchlets red-brown, glossy, with, the leaves quadrifariously and more loosely disposed; perichaetial leaves very long, subulate, $\frac{1}{2}$ line wide at bases, erect, flexuous; tips piliferous, very slightly and distantly serrulate (*sub lente*), with 5–7 dark longitudinal plaits, red at bases. Fruit-stalks many, sub 20 on a stem on the upper side of main branches, 1– $1\frac{1}{4}$ inches long, red and smooth (as also capsule), very flexuous, drooping, largely vaginant; vagina dark-brown. Capsule cernuous, not grooved, obovate-oblong, cylindric, turgid, unequal, lower edge straight, the upper gibbous; outer teeth incurved when dry, subulate, broad at base, brown, tips pale, closely barred with no medial line, margined with a dark line and a narrow hyaline slightly erose outer margin; inner teeth pale-yellow distantly barred with brown, their tips brown and filiform, with two long capillary knotty ciliæ between each tooth. Operculum half as long as capsule, base hemispherical, acuminate with a long obtuse beak. Calyptra dimidiate, 2 lines long, narrow subulate, obtuse, red, glabrous, glossy, cylindrical and entire for more than half of its length.

Hab. Growing on the ground in large patches among *Hymenophyllum*, in shady forests near Danneverke, County of Waipawa; 1887: *W.C.*

Obs. A fine handsome moss; its affinities are with two or three other fine dendroid New Zealand species of this genus—viz., *I. menziesii*, Hook.f. and Wilson; and *I.*

kerrii, Mitten; but differing from the former in its differently-shaped and much shorter capsule, in its perichaetial leaves not being serrate, and in its larger piliferous stem-leaves; and from the latter in its nerves not being excurrent; while from *I. marginatum*, Hook.f. and Wilson, it also differs in its capsule not being grooved and its leaves not margined.

2. *I. obscurum*,³⁰⁷ sp. nov.

Plant densely matted; rhizome creeping, branched. Stems dendroid, erect, 1½–2 inches high, sub-rigid, stoutish, cylindrical, bare and ringed below, with a few distant foliaceous scales scattered above; 3-pinnate, much and irregularly branched; branches at their bases like the main stem; branchlets usually short, stiff. Leaves dull green (becoming brownish and discoloured in age), sub-quadrifariously disposed, erect, very close, compact, imbricate, spreading, all similar, sub-linear-ovate, entire, acute, nerveless; cells very minute, narrow-linear, long, [242] crowded, shorter and clearer at base; perichaetial leaves long, acuminate, recurved, extending along fruit-stalk. Fruit-stalk short, 3 lines long, reddish, curved at tip. Capsule oblong, smooth, sub-erect, reddish; operculum sub-conical, with a short obtuse beak. Calyptra (young) smooth subulate long, narrow.

Hab. On ground, woods south of Danneverke, County of Waipawa; 1887: W.C.

β. Capsule grooved.

307 *Camptochaete angustata* (Mitt.) Reichardt.

3. *I. tomentosum*,³⁰⁸ sp. nov.

Plant dendroid; stems stout, erect, flexuous, 2–3 inches high, bearing many large scattered leaves, densely clothed with fine dark-brown branched tomentum-like rootlets, the top much and closely branched forming a thick globose mass 1½ inches wide; branches pinnate. Leaves numerous, rather close, sub-decussate, their bases imbricate, triangular-ovate, base subcordate, clasping, very acuminate, tips acute, spreading; margins of upper half coarsely serrated, of the lower half slightly uneven and narrowly margined, pale-yellowish-green (tinged with red in age), glabrous, glossy, nerve stout, vanishing below tip; cells longitudinal, exceedingly narrow, broader and oblong at the wings of base; leaves of stem very large, 2 lines long, 1 line broad at base, triangular, very acuminate; tips acute, long, almost acicular; nerve strong, sub-flexuose. Fruit-stalks numerous, 1–20, erect, 1 inch high, stoutish, flexuous, twisted above, dark-red, shining. Capsule sub-obovate, 1½ lines long, broadly and deeply grooved, dimidiate, horizontal and sub-cernuous, the lower margin straight, the upper arched, strumose, dark-red, glossy; operculum large, nearly as long as capsule and same colour, hemispherical, beak very long, depressed, acute.

Hab. High lands, interior, north of Napier; 1887: *Mr. A. Hamilton.*

Obs. This species has affinity with *I. comosum*, Hook.f. and Wilson, but it is very distinct. Unfortunately I have only had two specimens to examine (the discoverer

having mislaid his specimens), and both were old, with the greater number of their capsules broken (or gnawed) at their tips.

Genus 67. Hypopterygium, Bridel.

I. HYPOPTERYGIUM.

(Stem 2–3-pinnately branched above, there orbicular or deltoid in outline; branches radiating. Fruit-stalk rather long.)

β. Leaves with bristles intermixed.

1. *H. elegantulum*,³⁰⁹ sp. nov.

Rhizome long, creeping, slender, distantly branched. Plant 1½–2 inches high, erect, bipinnate, soft, delicate, neat, bright [243] emerald-green. Stem slender, usually ½ inch, sometimes 1 inch long, simple (rarely forked, or with 3 main-stem-like branches), scaly from base; scales sub-foliaceous, distant, scattered, sub-ovate-acuminate, patent. Frond orbicular, 1¼–1½ inches diameter; branches few, alternate, open, radiating, very narrow. Leaves (lateral) sub-distichous, distinct, free, alternate, dimidiate, orbicular-ovate, serrate, tip very acuminate, the bases large and overlapping; nerve extending ¾ths of leaf; cells minute, sub-orbicular, guttulate, crowded: (dorsal) deltoid-orbicular, ciliate, nerveless, tip acuminate very long; cells larger and clearer; a single long flexuose spreading seta alternate from each dorsal leaf: (perichaetal) outer leaves sub-orbicular, concave; the inner ovate-acuminate, margins entire; tips very long, piliferous, flexuous; cells long linear, very close. Fruit-

309 *Canalohypopterygium tamariscinum* (Hedw.) Kruijer.

stalk $3\frac{1}{2}$ lines long, twisted, thickened at top, red-brown, vaginant, 2–12 together on a stem. Capsule cylindrical, oblong, constricted below mouth, tubercled at base, horizontal and inclined, red-brown; cells of capsule broadly oval with double walls and minute cellules in them. Teeth, outer, brown, subulate, very acuminate, tips sub-piliferous, with closely barred double lateral lines and a short faint median line, margins dark; inner teeth, short, pale, blunt, loosely barred. Calyptora (immature) conical-acuminate, slightly fissured at base, not dimidiate; base white, pale-green above. Operculum not seen.

Hab. On the ground, shady ravines, forest south of Danne-verke, County of Waipawa; 1887: *W.C.* Rather scarce.

Obs. A. species having pretty close affinity with *H. tamariscium* and *H. rotulatum*, Hedw. Its habit of growth more open and scattered than obtains in the other New Zealand species of this genus. A truly elegant moss.

ORDER V.—HEPATICÆ.

Genus 2. *Jungermannia*, Linn.

1. *J. geminiflora*,³¹⁰ sp. nov.

Plant tufted, spreading, erect, 1 inch high, branched; stems very leafy and rooting on under-surface, $\frac{1}{20}$ th inch wide. Leaves light-green with a purplish tinge, sub-deltoid-ovate, $\frac{1}{25}$ th inch long, very broad, acute,

310 *Cuspidatula monodon* (Hook.f. & Taylor) Steph.

apiculate, tips incurved, opposite, imbricate, sub-vertical, spreading, narrowly margined with a dark line, edges unequal entire and slightly undulate, mostly more so on one side, decurrent on upper surface; cells minute, orbicular, distinct, guttulate, arranged regularly in longitudinal rows, smaller at margins, larger oval and punctured in centre; involucral leaves large, spreading, waved, deeply lacinate-ciliate. Stipules 0. Perianth terminal, often twin (1 on short lateral branch at tip), large, $1\frac{1}{2}$ lines long, oblong-ovate, inflated, [244] sub-8-plicate, mouth deeply lacinate; laciniæ ciliate at tips; ciliæ waved, jointed; cells as in leaves. Capsule (immature, at bottom of perianth) stalked, globular, longer than broad, apiculate, shining, green. Sporules numerous, triangular; elaters small, stout, obtuse.

Hab. In patches among mosses, woods South of Danneverke, County of Waipawa; 1887: *W.C.*

Obs. A species allied to *J. monodon*, Hook. fil. and Tayl., but differing in several particulars.

Genus 3. **Plagiochila**, Nees and Montagne.

§ I. Stems simple or sparingly branched.

1. *P. recta*,³¹¹ sp. nov.

Plant small, gregarious; rhizome creeping. Stems erect, simple, sometimes forked or slightly branched, $\frac{3}{4}$ –1 inch high, 2 lines wide, tips decurved. Leaves alternate, sub-imbricate, obliquely oblong-cordate, entire, falcate, very thin and tender, of a lively light-green, apex truncate,

311 *Plagiochila radiculosaa* Mitt.

recurved, with 2 minute divergent acute teeth, one at each outer angle; ventral margin much arched, the base free, large and round, produced and meeting the opposite leaf on ventral side, and so appearing as a uniform longitudinal line or ridge; dorsal margin straight, decurrent, with a crease in each leaf where it joins the stem. Cells crowded, orbicular with double walls and minute cellules regularly disposed in their centres, clear. Involucral leaves broader and larger with margins minutely denticulate. Perianth large (for plant), terminal, sessile, pale green, sub-oblong-quadrata, sides straight (*poculiform*), thin, much compressed above, inflated below, mouth truncate, entire, margin slightly sinuate and irregularly denticulate.

Hab. In low wet woods near Norsewood, County of Waipawa; forming small thick patches on branches of trees; 1886: *W.C.*

Obs. This is a peculiar looking little species when in flower, owing to its large pale and straight-sided terminal perianths; apparently it is rather scarce. In size and general appearance it is somewhat like *P. serrata*, Lind., and *P. approximata*, Lind.; while the form of its leaves closely resembles those of *P. radiculosa*, Mitten, (a much larger indigenous species, differing widely in habit, shape of perianth, and areolation;) its leaves are also largely and regularly produced at their ventral bases, somewhat like those of *P. hypnoides*, Lind.

2. *P. cæspitosa*,³¹² sp. nov.

Plant densely gregarious; rhizome creeping, wiry, dry, much branched and implexed. Stems brownish, erect, simple, rarely branched, 1–1½ inches high, 3½ lines wide, leafy to base, tips [245] recurved. Leaves alternate, close, sub-imbricate, obliquely cordate-orbicular, 2 lines long, very obtuse, narrowly margined, semi-amplexicaul, spreading, decurved, dusky pale-green rather obscure (when dry, margins revolute); ventral margin and apex denticulate, teeth irregular and distant, acute and obtuse, base free, produced, overlapping stem; dorsal margin entire, nearly straight, slightly decurrent, thickened and contracted at junction with stem, small and sub-orbicular at base. Cells very small, oval, with double walls and minute cellules in them, crowded, distinct. *Male*: Spike near top of branch, broadly conical, 5-jugate; scales rather large, entire, recurved; sometimes 3–4 spikes on one branch, each separated by a few leaves. Fruit not seen.

Hab. Forming small thick cushion-like tufts on branches of trees, in low, wet, and dark woods, “Forty-mile Bush,” near Norsewood, County of Waipawa; October 1886:
W.C.

3. *P. heterophylla*,³¹³ sp. nov.

Plant small; rhizome wiry, creeping; stems erect, sub-rigid, 1½ inches high, 2 lines broad, distant, simple and forked, leafy to base, reddish-brown; branches few, long

312 *Plagiochila deltoidea* Lindenb.

313 *Plagiochila fasciculata* Lindenb.

and straight, with a few short branchlets at top, pale reddish-green and semi-transparent. Leaves bright-green sub-amplexicaul, slightly decurrent both sides on stem, the ventral bases scarcely overlapping; those on main stems triangular or deltoid-oblong, their apices very obtuse, 12–14 irregular long lacinate teeth on ventral margin and at apex, of which about 6 are apical; leaves on the branches $\frac{1}{10}$ th inch wide including stem, with fewer teeth; and those on the ultimate branchlets are exceedingly small, being only with the stem $\frac{1}{20}$ th inch wide, oblong, the ventral margin rounded, the dorsal straight, and both entire; the apex truncate with 2–3 very long and distant spiny teeth. Involucral narrow, erect, with 3–4 long spreading laciniae at apex. Cells minute, sub-orbicular, crowded, walls thick with numerous minute intermediate cellules. Perianth small, terminal and solitary at end of sterns and main branches, peduncled, narrow-campanulate, $\frac{1}{10}$ th inch long, whitish; base tapering, constricted; mouth broad cilio-lacinate; teeth many, erect. Capsule sub-obovoid, brown; valves oblong-lanceolate, obtuse, dark-veined longitudinally; seta exserted, 2 lines long.

Hab. On logs and trunks of trees, wet woods near Danneverke, County of Waipawa; 1887: W.C.

Obs. This is a small delicate-looking slender wiry species, allied to *P. distans*, Col.,³¹⁴ and *P. distinctifolia*, Lind. Its small leaves resemble those of *P. spinulosa*, Nees and Mont., a British species. [246]

314 WC: "Trans. N.Z. Inst.", vol. xix., p. 283.

4. *P. rotundifolia*,³¹⁵ sp. nov.

Plant densely cæspitose, sub-dendroid, erect, 1 inch high, dark olive-green, the young leaves at tips light-green; stem bare at base, forked, loosely branched above in 4–5 branchlets; tips recurved, drooping. Leaves small, close, imbricate, spreading, rotund, $\frac{1}{15}$ th inch diameter, undulate, slightly decurrent, sub-amplexicaul, the portion adhering to stem being very small, margins minutely and regularly waved and finely serrulate (*sub lente*); dorsal margin recurved, entire near stem. Cells minute, orbicular, with thickened walls and very minute cellules in them, larger and oblong at base of leaf.

Hab. Among small herbage, shaded woods, base of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

§ II. Stems erect from a creeping rhizome, tall, much branched, dendroid.

5. *P. trispicata*,³¹⁶ sp. nov.

Rhizome creeping, matted; plant densely cæspitose; dendroid, erect, 4–4½ inches high, main stem 1½–2 inches long, leafy from base, 3 lines wide, much branched at top; branches 1½–2 inches long, 2–2½ lines broad, spreading, erect, dichotomous, branches and leaves flat. Leaves yellowish-green tinged with brown, alternate, imbricate; those on the main, branches broadly sub-deltoid, 2 lines long (smaller on the branchlets); ventral margin curved, laciniate-toothed, the bases round

315 *Plagiochila fuscella* (Tayl.) H. & T.

316 *Plagiochila arbuscula* (Brid.) L. & L.

and much produced, largely cilio-laciniate and overlapping; dorsal margin straight, nearly entire or with 1–2 small teeth, and set very obliquely on stem; apices truncate with 3–5 large irregular sub-laciniate teeth.

Involucral leaves much the same, but erect, with their dorsal margin more ciliated. Cells broadly oval, distinct, filled with minute pellucid cellules. Perianth terminal on short lateral branchlets, sessile, compressed, whitish, 2½ lines long, ovate, dimidiate, obtuse; mouth sub-urceolate; lips and apex largely lacinate-ciliate; laciniæ bifid, acute, sub-flexuous, spreading, cellular. *Male* plant smaller and less robust; spikes terminal at tips of branches, mostly 3 (sometimes 2, 4,) together, shortly peduncled, 2 lines long, divergent, sub-triangular, acute, deeply channelled on one side; scales in 2 rows, large; tips recurved, the lower nearly entire, the upper shortly bidentate.

Hab. On trees and logs, damp woods near Danneverke. County of Waipawa; 1887: W.C.

Obs. A rather peculiar species from the shape of its perianth, and also from its conspicuous and divergent 3 male spikes.

6,³¹⁷ sp. nov.

Plant closely cæspitose, pale green; rhizome wiry, creeping, much entangled, tough. Stems erect, leafy from base, 2–3 [247] inches high, 3 lines wide, simple, forked at middle, branched at top into 4–5 short branchlets; tips recurved. Leaves alternate, rather distant, not imbricate, broadly oblong or somewhat sub-orbicular, wavy and concave, 2 lines long, apex much rounded; the ventral

317 *Plagiochila deltoidea* Lindenb.

margin and apex distantly and irregularly cilio-laciniate; the dorsal margin entire, base slightly oblique and decurrent on stem. Cells orbicular, crowded, smaller at margins, their walls double, thickened, with minute cellules. Perianths few, scattered, axillary between branches, sessile, obconic-campanulate, 1 line long, compressed; apex rounded; lips ciliated, extending down on one side; dark-green.

Hab. On trees and logs, in woods with the preceding species, *P. trispicata*; 1887: W.C.

7. *P. subfasciculata*,³¹⁸ sp. nov.

Plant dendroid, 2–3 inches high; rhizome creeping, long, wiry; stems slender, erect, sub-rigid, dark coloured, leafy from base, much branched; branches alternate, bipinnate, long, diffused, irregular, (often a long branch at right angles from main stem,) branchlets opposite, sometimes 4–6 short ones nearly together at top of branch, sub-fasciculate. Leaves light-green, sub-opposite, rather distant, scarcely overlapping at extreme margins, somewhat semi-lunar or sub-rhomboid-dimidiate, apex broad, rounded; those on main stems and branches 2 lines wide, on branchlets much smaller; ventral margin much curved and, with apex, laciniate toothed, sub 12 teeth, long, acute, irregular in size, distant, longer and closer at apex, few or none at base, basal margins slightly impinging, decurrent on stem, sinus between teeth broad and rounded; dorsal margin entire, oblique, slightly decurrent on stem. Involucral large, erect, apex much laciniate. Cells opaque, sub-orbicular, double-walled

318 *Plagiochila fasciculata* Lindenb.

with minute intermediate cellules. Perianth rather small, dark-green, sessile, axillary between branchlets, broadly cuneate or sub-campanulate, slightly compressed; mouth large; lips rounded, cilio-laciniate; teeth irregular, larger in centre, acute, many-celled. Cells similar to those of leaves but more oblong.

Hab. On logs and trunks of trees, wet woods near Danneverke, County of Waipawa; 1887: W.C.

Obs. The nearest affinity of this species is with *P. exilis*, Col.³¹⁹

Genus 7. *Gottschea*, Nees.

* Leaves stipulate.

1. *G. truncatula*,³²⁰ sp. nov.

Plant small, gregarious, prostrate, $\frac{1}{2}$ – $\frac{3}{4}$ inch long, 4 lines wide, oblong, simple rarely forked, dark-green, leafy from base, [248] with numerous dark-purple rootlets. Leaves close, imbricate, very thin; ventral lobe oblong-ovate, tips rounded with 2–4 narrow plaits running obliquely from dorsal lobe to margin; margins minutely serrulate and irregularly sinuous and notched from the plaits; the upper basal margin largely ciliate; ciliæ capillary, long and wavy, composed of several single cells placed longitudinally: the dorsal lobe short, only $\frac{2}{3}$ rds length of the ventral, sub-trapeziform or sub-cordate-dimidiate, minutely serrulate, its upper basal margin rounded and produced beyond the ventral lobe but not really wider than it; apex broad and very truncate.

319 WC: "Trans. N.Z. Inst.", vol. xix., p. 282.

320 *Schistochila balfouriana* (Hook.f. & Taylor) Steph.

Cells sub-orbicular, close, with double walls containing minute pellucid circular cellules. Stipules large, somewhat sub-quadratae in outline, narrowest at base, 3-4-lobed, much laciniatae and largely ciliatae; ciliae long, jointed, very flexuous and acute; cells narrow-oblong, their ends obtuse and truncate, closely compacted. On the stem between the leaves are several long narrow irregular cellular processes or leaflets, in 2-3 rows, patent and much ciliated.

Hab. On the ground, in damp woods near Danneverke, County of Waipawa; 1887: W.C.

Obs. A species near *Gr. trichotoma*, Col.,³²¹ but differing in being much smaller and simple, with notched margins to its leaves, and particularly in its very short and broadly truncate dorsal lobe.

2. *G. flavo-virens*,³²² sp. nov.

Plant very small, gregarious, prostrate, broadly obovate, sub $\frac{1}{2}$ inch long, simple; yellowish-green with red rootlets at base. Leaves oblong-ovate, obtuse, margins slightly serrate; the ventral basal portion shortly laciniatae-serrate; the margin of the dorsal lobe very slightly serrulate, tip oblique, rounded, the base slightly produced, its margin nearly entire. Stipule large, sub-quadratae, bilobed; lobes broad, coarsely laciniatae with numerous broad laciniæ; sinus large, extending $\frac{1}{3}$ rd down. Cells small, orbicular and very regular, with

321 WC: "Trans. N.Z. Inst.", vol. xviii., p. 240.

322 *Schistochila repleta* (Hook.f. & Taylor) Steph.

minute pellucid cellules in angles between cells; oblong and larger at base of stipule.

Hab. On the ground, sides of streams, in woods with the preceding species, *G. truncatula*; 1887: W.C.

Obs. A species having affinity with *G. pallescens*, Col., and *G. læte-virens*; Col.³²³

3. *G. squarrosa*,³²⁴ sp. nov.

Plant large, sub-ascending, 7 inches long. Stem stout, dark-brown, leafy, simple, with 2–4 short and forked branchlets at top; base bare. Leaves alternate, large, green, very distant [249] and squarrose on main stem, which is 5–6 lines wide including leaves, decreasing in size downwards towards base, close and sub-imbricate on branches, conduplicate, lobes united at lower dorsal margin, which is thickened and entire; dorsal lobe oblique, cordate-acuminate, the base very much produced and rounded semi-orbicular, margin entire; tip suddenly acuminate, acute; anterior margin uneven, wavy with minute plaits, both upper margins and tip finely denticulate; ventral lobe much longer than dorsal, sub-oblong-trapeziform, apex oblique, obtuse, the anterior margin nearly straight; margins minutely serrulate with a few (2–3) small ciliæ near base; the apices of the two lobes very divergent. Stipules distant from base of leaves, patent, large, rotund, 1½ lines diameter, retuse; margins entire, slightly and sparingly ciliate at apex and on the upper sides; finely and obsoletely waved laterally, with a

323 WC: "Trans. N.Z. Inst.", vol. xviii., pp. 238 and 241.

324 *Schistochila nobilis* (Hook.) Trevis.

long thick longitudinal plait in the centre. Cells rather opaque, crowded, oval; walls thick with minute cellules in the angles. 2–3 small linear segments (phyllodia) on main stem in the axils of the leaves, their margins entire with 2 long hair-like ciliæ at the tip of each.

Hab. High lands, woods north of Napier, Hawke's Bay; 1886: *Mr. A. Hamilton.*

Obs. This is another very fine species, pretty closely allied to *G. nobilis*, Nees, and to *G. dichotoma*, Col.,³²⁵ but differing considerably in many characters: as in the great distance between the stem leaves, and their squarrose habit, in the form and serratures of leaves, lobes, stipules, and phyllodia, and in their cells.

** Leaves without stipules.

4. *G. plumulosa*,³²⁶ sp. nov.

Plant densely tufted, erect, 1½ inches high; yellowish-green, becoming light-brown in age; stems stout, 3 lines wide including leaves, sub-obovate-linear, leafy to base, simple and forked, sometimes with two short opposite lateral branchlets at tips; tips nodding, sub-circinate. Leaves exceedingly thin, very close-set, bifarious, regular, imbricate, spreading, their lobes con-duplicate united at the dorsal margin, the dorsal lobe a little smaller, both lobes overlapping at dorsal and ventral bases, deeply bifid at apex; apical segments long, laciniate, acuminate; margins of both lobes largely laciniate-ciliate; ciliæ very long, 2–3 branched, acute,

325 WC: "Trans. N.Z. Inst." Vol. xviii., p. 284.

326 *Paraschistochila pinnatifolia* (Hook.) R.M.Schust.

and very cellular. Stipules 0. Cells large, very distinct, oval; their thickish double walls containing numerous minute cellules.

Hab. Forests, Ruatahuna, County of Whakatane; 1886
Mr. A. Hamilton. [250]

Obs. This species is allied to *G. pinnatifolia*, Nees; and also to *G. ciliigera*, Hook.f. and Taylor, another large species; but it is a much smaller plant than either, and widely differing in habit, and the form of its compound laciniate ciliæ and cells. Sir J.D. Hooker has united those two species in the "Handbook N.Z. Flora," p. 514, but I venture to consider them to be very distinct. This small species is a truly elegant plant, and takes its trivial name from its nodding plume-like tips.

5. *G. homophylla*,³²⁷ sp. nov.

Plant small, prostrate on mosses, and sub-ascending. Stems $\frac{3}{4}$ –1 inch long, simple and forked near base, ovate-acuminate and broadly lanceolate, 4 lines wide, leafy throughout, with a few fine rootlets at base; both sides of the plant nearly alike; colour a pale whitish-brown (which may, however, have happened from being badly dried). Leaves closely imbricate, sub-falcate, excessively thin, broadly ovate; both dorsal and ventral lobes sub-similar in shape, ovate-acuminate, the ventral a little more acuminate; margins entire; tips serrate; dorsal lobe concave, united to ventral lobe within margin, which extends in a narrow line beyond it; the stem completely hidden on both upper and under sides through the leaves closely and largely overlapping. Stipules 0. Cells small,

327 *Paraschistochila tuloides* (Hook f & Taylor) R. M Schust.

sub-orbicular and somewhat obscure, with minute starry dots at their angles.

Hab. Forests near Waikare Lake, County of Whakatane; 1886: *Mr. A. Hamilton.*

Obs. This is a most peculiar and very distinct species, widely differing from all others known to me. Its upper and under surfaces are so very much alike that it is difficult to distinguish them, save by their rootlets at their bases; there are also its entire margins, and it being without stipules; and then the most curious structure of its cellules and their unique star-like appendages. Unfortunately, I have seen but a few whole specimens (about half-a-dozen); it seems to have been collected hastily among other and larger *Hepaticæ* and mosses, whence I picked it out.

Genus 16. *Isotachis*, Mitten.

1. *I. rosacea*,³²⁸ sp. nov.

Plant closely gregarious, erect, delicate. Stems rather stout, dark-coloured, 3 inches high, narrow, 1 line wide including leaves, leafy throughout, 1–2 branches above; branches $\frac{1}{2}$ – $1\frac{1}{2}$ inches long, spreading; tips rounded, nodding. Leaves very close, uniform and regular, sub-opposite on main stem, and opposite on branches, all rose-pink, (also the stipules,) sub-quadrata, apices quadrifid; lobes free, sinuses large, coarsely denticulate; tips acute; dorsal margin entire; ventral margin [251] denticulate; sub-imbricate and closely adpressed at their dorsal bases completely hiding the stem; their ventral

bases patent. Stipules patent, cordate, bifid; apices obtuse; margins sub-ciliate-denticulate; ciliæ free, rather distant; bases sub-amplexicaul. Cells oval and sub-orbicular, smaller at margins, larger oblong and parallelogrammatic in the centre and at the base.

Hab. High lands, interior, north of Napier; 1886: *Mr. A. Hamilton.*

Obs. A truly graceful species; pretty nearly allied to *I. lyallii*,³²⁹ Hook. fil., but differing in size, colour, shape of leaves and stipules, and in the form, etc., of its cellules. Its delicate rose-pink colour, alike throughout, enhances its beauty, and makes it an attractive and elegant object.

Genus 17. *Trichocolea*, Nees.

1. *T. elegans*,³³⁰ sp. nov.

Plant prostrate, spreading in thick matted tufts or patches, with rather long creeping stems or ultimate branches (2–3 inches), bright green, sub-quadrangular. Stems minutely and closely hairy, their leaves broadly transverse rather distant; secondary branches bipinnate, horizontal, broadly ovate or rhomboid in outline, presenting a regular fern-like appearance; branches and branchlets cylindrical, symmetrical, radiating, spreading; ultimate branchlets compacted, sub-globose, and pale at tips. Leaves numerous, sub-verticillate; segments wholly capillary, branched, jointed, acute, implexed. Stipules multifid, capillary spreading, much like leaves. Peduncle very

329 WC: Originally discovered on the summits of the neighbouring high mountain (Ruahine) range.

330 *Trichocolea australis* Stephani.

stout, 1 line long, succulent, slightly hairy, erect from upper surface of branches near top of frond, sometimes geminate. Calyptra oblong, scaly, very hairy at top, hairs whitish, spreading; scales long, ovate-acuminate, laciniate-ciliate, recurved.

Hab. On rotten logs, wet shaded woods, Norsewood, County of Waipawa; 1886; and also near Danneverke, same county; May, 1887; W.C. Glenross, County of Hawke's Bay; October, 1887: *Mr. D. P. Balfour.*

Obs. This is a truly elegant little plant; its pleasing green tufts, with their central short flat bipinnate radiating branchlets symmetrically disposed, give it a very neat appearance; which is still further heightened by its long slender creeping stems or branches. While in shape and habit it differs largely from its congeners, *T. tomentella* and *T. lanata*, yet it approaches them pretty nearly in the form of its leaves and stipules; which, however, are still more multifid and capillary. [252]

Genus 23. *Frullania*, Raddi.

1. *F. viridis*,³³¹ sp. nov.

Plant creeping, 1–2½ inches long, bipinnate, green; branches numerous, rather long, free, spreading, somewhat soft. Leaves imbricate and closely set, rotund-reniform, patent; margins entire and slightly irregular; lobule minute, arched, green; tip sub-acute. Stipules adpressed, reniform-orbicular; margins slightly uneven, shortly bifid, sinus cuneate, broad. Cells minute, orbicular, opaque, larger at bases. Perianth smooth,

331 *Frullania squarrosula* (Tayl.) E.A.Hodgs.

oblong, sub-inflated, triquetrous, largely obtusely angled on one side, with a corresponding central depression on the other; apex obtuse, mucronnlate.

Hab. On branches of trees, forming thickish patches, forests at Danneverke, County of Waipawa; 1887: *W.C.*

Obs. A species allied to *F. squarrosula*, Hook.f., but of a different habit, form, and colour, with differently shaped leaves and stipules, and the perianth more inflated and keeled.

2. *F. echinella*,³³² sp. nov.

Plant small, purple-brown, sub-rigid, creeping, 1–2 inches long; stems closely intermixed and overlapping; branches dichotomous, leafy, narrow, $\frac{1}{50}$ th inch wide including leaves; branchlets pinnate. Leaves alternate, imbricate, broadly oval, their tips sub-recurred; young leaves green, brownish on upper surface with narrow dark margins; lobule small, not produced beyond leaf, arched with acute tip; corner of leaf not indexed. Cells regular, orbicular, with a minute pellucid round cellule in each outer angle. Stipules sub-orbicular, longer than broad, margins slightly uneven, bifid nearly to base, angles of lobes acute. Perianth sub-obovate, triquetrous, sub-compressed, one side slightly convex, the other carinate, finely and densely muricate-echinulate; apex retuse, mucronate. Involucral leaves margins entire.

Hab. On branches of living trees, chiefly *Myrtus bullata*, forming tolerably large and thick patches; sides of

332 *Frullania pycnantha* (Tayl). E.A.Hodgs.

streams, forests near Danneverke, County of Waipawa:
1887: W.C.

Obs. This species, from its peculiar perianth, will no doubt belong to the new sub-genus *Trachicolea*³³³ of Dr. Spruce; one of the smallest sections of this very large and extensive genus.

Genus 24. *Fossombronia*, Raddi.

1. *F. gregaria*,³³⁴ sp. nov.

Plant densely cæspitose, erect, 2 inches high, succulent, fragile, pale green. Stems simple, rarely forked, with many [253] purple rootlets. Leaves large, 3½–4 lines broad, imbricate, pellucid, waved and crumpled, semi-amplexicaul, margins sinuate; the upper leaves sub-reniform, sub-rosulate at top of stem; the lower, sub-quadratae and largely decurrent. Cells very large, of various shapes and sizes, broadly hexangular, oblong, sub-quadrangular and sub-orbicular. Perianth terminal and sub-terminal, broadly campanulate, 2½ lines long, 2 lines broad, mouth open, spreading, much waved, margin sinuate, entire; colour and cells as in leaves. Seta 9–15 lines long, erect, stoutish, white. Capsule oblong, very obtuse, minutely reticulate, dark-brown; valves 4, split to base, but breaking up into quadrangular bits after the manner of *Petalophyllum*. Elaters brown, cylindrical,

333 WC: In his “Hepaticæ Amazonicæ et Andinæ,” p. 31. An excellent and exhaustive work of nearly 600 closely printed pages, reflecting the highest credit on the author, also on the Botanical Society of Edinburgh, under whose auspices it was recently published.

334 Not found.

flexuous, bi-spiral, forming an unbroken curve or loop at one end, and returning, so that the two ends equally meet at the opposite end; tips truncate. Spores orbicular, echinulate.

Hab. Woods at Tarawera, hilly country north of Napier; 1886: *Mr. H. Hill.*

Obs. A very peculiar species, from its erect and densely gregarious habit of growth, so different from that of its known congeners. In determining the curious elaters of this species I have been generously and largely aided by Dr. W. I. Spencer, F.L.S.

Genus 27. *Zoopsis*, Hook.f. and Tayl.

1. *Z. tenuicaulis*,³³⁵ sp. nov.

Plant minute almost capillary, straight and flexuous, pale green; frond prostrate, delicate, highly cellular, transparent, few-branched, 1–1½ inches long, $\frac{1}{40}$ th inch broad; midrib strong and dark, a single row of large sub-oblong-quadrata cells on each side, with 2 fascicled claw-(or finger-and-thumb-) like lobes, alternately and pretty regularly disposed on both sides, the upper lobe of 3 (rarely 4, 5,) cells always the longest and sub-acute, the lower lobe of 2 (rarely 3) cells stouter and obtuse; the cells of the lobes oblong-orbicular, the lowest one being much larger, the upper (of the 3-celled lobe) very small and curved; the lobes on the lower part of the stem distant, those on the upper portion and on the branchlets are much closer. Flowers and fruit not seen.

335 *Stet.*

Hab. Among *Symphyogyna*, and other low close-growing *Hepaticæ*, from base of Tongariro Mountain Range, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. A very minute microscopical plant, picked out from among other *Hepaticæ*; allied to *Z. argentea*, Hook.f. and Tayl., but much more slender and very distinct.

2. (?) *Z. ciliata*,³³⁶ sp. nov.

Plant small, tufted, delicate, flaccid, erect, $\frac{1}{2}$ – $\frac{3}{4}$ inch high, bright grass-green. Fronds flat, a little waved, $\frac{1}{10}$ – $\frac{1}{2}$ inch [254] broad at base, simple, lobed, and digitate above; lobes long, linear, $\frac{1}{40}$ – $\frac{1}{20}$ inch wide, sometimes forked and trifid, obtuse and sub-acute; margins slightly sub-sinuate and denticulate, ciliate with scattered long brown glandular flexuous flattish ciliae; the bases of fronds red-brown and hairy; hairs long and flexuous. Cells large, irregular, of various sizes and shapes, mostly oblong-hexagonal, smaller, regular, and sub-quadrangular at margins; minute, obovate and lanceolate, obtuse, sub-sessile lobes (or sacs?) are sometimes scattered (occasionally 2–3 together) on margins and disk of frond, also at apex, giving it a proliferous appearance; their cells are smaller and orbicular.

Hab. Among other densely-growing *Hepaticæ*, on branches of living trees, woods near Norsewood, County of Waipawa; October, 1886: *W.C.*

Obs. This is a curious and strange-looking little plant; to me, almost unique in appearance, etc.; its fructification, however, has not yet been detected, and therefore it is

only now placed provisionally here as a species of *Zoopsis*. To this small endemic genus of frondose *Hepaticæ* it seems to be more naturally allied than to any other; at the same time there are grave differences. I may also observe that I have only now met with this plant, in this one locality, though pretty plentiful there.

Genus 30. *Symphyogyna*, Mont. and Nees.

1. *S. connivens*,³³⁷ sp. nov.

Plant terrestrial, small, simple, gregarious, stipitate, erect; delicate pale-green; root (and stipe) dark pink, cylindrical, succulent, slightly hairy; hairs patent; stipe $\frac{3}{4}$ inch long, flexuous, smooth, glossy, succulent; frond oblate-orbicular, broader than long, 6–8 lines broad, 4–5 lines long, dichotomous, 2-branched from top of stipe; branches equal, broad at bases, conniving and forming a cup-like cavity at top of stipe, wavy, not decurrent, on stipe; each branch 2–3-lobed or sub-branched, and cut nearly to base; each lobe deeply divided; ultimate lobes short, broad, truncate, nerved; margins largely serrate; serratures broad, long, and sharp, with 5–9 cells ha each; cells large, sub-orbicular, their walls thick and dark. Involucre very small at bases of main branches on the upper surface, 2 on "a frond, much and finely lacinate; laciniæ recurved, somewhat glossy. Calyptra (immature) shortly peduncled.

337 Not found.

Hab. Among mosses and other small plants, base of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

1887 Ancient tide-lore and tales of the sea, from the two Ends of the World. *Transactions of the New Zealand Institute* 20: 418-422.

[*Read before the Hawke's Bay Philosophical Institute, 15th August, 1887.*]

[ABSTRACT.]³³⁸

I HAD been lately reading some of the curious theories respecting the tides of the sea that were anciently held or advanced by the wisest and most civilized nations, or the philosophers of Greece and Rome; also some far more strange and peculiar notions held by Western Europe, and by Oriental races in more modern times, which, possibly, in a measure are still by them maintained: and this naturally brought me to a reconsideration of [419] what the Maoris believed to be the origin and cause of the tides, which, being curious, and not wholly unlike what has been anciently upheld in other parts of the world, has induced me to write a paper on it. ...

338 The full version was printed in 1889: Napier, R.C. Harding. (see below).

The New Zealanders believed that the ebbing and flowing of the sea was occasioned by a huge ocean monster, whose home was low down in the depths beyond the horizon, through its powerful and regular respiration, or ingurgitation and regurgitation of the water. Far-off foreign lands were considered to be lying beyond it. This monster's name was Parata; which term is commonly used figuratively and proverbially for any one unexpectedly meeting with great trouble—that such a person has fallen into the throat of the *Parata*. Indeed, in one of their ancient and prized myths, which treats in popular language of their first peopling New Zealand, one of their chief canoes, named the "Arawa," is said to have really got into that difficulty, and was carried into the enormous mouth of the monster, from which fearful maelstrom it was with difficulty extricated by Ngatoroirangi, the courageous and cunning *tohunga* (= priest, or wise man) on board, who recited his powerful charm for that purpose, which proved effectual; the words of the said charm or spell being also preserved.³³⁹

Not unfrequently in former years (since the New Zealanders had learned to write) a laconic epistle, etched with a nail or fragment of shell on a fresh flax leaf, would be despatched from those in sudden private or local trouble to their relatives or friends, couched in these words: "Friends, listen! we have fallen into the throat of the *Parata*;" and that, like the fiery cross of the far north, would often be sufficient to secure their prompt and hearty assistance.

339 WC: Grey's "Mythology," p. 72.

As might naturally enough be supposed among a superstitious people, abounding in charms and spells, witchcraft and incantations, the aid, real or imaginary, of such a powerful living being, whose irresistible and regular action was daily seen, was sure to be malevolently sought against their enemies: so one of their solemn maledictory spells begins thus:—

“Dreadful, big, beetling precipices, deep down in Ocean’s depths, listen! obey! be quick and be scattered far off to the right and to the left,³⁴⁰ that the mighty *Parata* may go to work. *Parata!* hear! blow thy irresistible overwhelming tides strongly to the shore!”

This was done in order that the sea-side forts and villages (always close to the beach, and sometimes built on it) might be inundated, and so easily overcome, and the inhabitants scattered and, with their canoes, destroyed.

[420]

Of course, we of to-day are a step in advance of our own forefathers in this matter; we can well afford to laugh at the power of such a charm or spell, based on such a belief; nevertheless the New Zealanders believed in it, and we may easily imagine that if, after solemnly uttering their spells by the priests at their pagan altars, and with all due and fearful invocations and ceremonies, a storm came on from the sea, or a high tide followed, such would be laid hold of as a favourable omen, and be sure to inspire them with extra courage in their fiendish work of destruction and slaughter! Besides, among a race like

340 WC: Lit., “to the one side and to the other side:” “*ki tetahi taha, ki tetahi taha.*”

the Maori—keen and constant observers as they ever were of the appearances of the heavens and of the varied phenomena of Nature; who had proper significant names even for every day of the moon's age, with their lucky and unlucky days, as well as for the different stages and seasons of the tides; who knew all about times of flood and ebb, of high and of low water, spring and neap tides, with their numerous intermediate variations—it is likely that their *tohunga*, who had to utter the said powerful charm, would avail himself of his knowledge of the time of the spring tides to make it appear to be the more effectual.

I scarcely need remark that such spells and invocations were not confined to the New Zealanders, or to uncivilized people like them. Plenty of such doings will be found among the records of the oldest and most civilized nations of antiquity.

....

Formerly, and down to some years ago, the winding-track or course from Napier into the interior to Te Aute and Waipawa lay by the immediate bank of the River Ngaruroro; and one of the ugly and often dangerous places which had to be crossed at its mouth was a brawling, noisy watercourse, or fall, on the east bank, which drained the big marsh on the plains. This waterfall was called by the Maoris *Wahaparata* = Parata's Mouth, from the noise it made, from the ever-varying amount of water it discharged, and from it being disagreeable and dangerous; besides, as I have heard old Maoris say, it was affected by the high tides on the coast; and in this respect they may have been correct, as the sea is not far

distant in a direct line, and the River Ngaruroro (and also the River Tukituki, which bounds the said marsh on its east side) is but a short distance from it, and both rivers are greatly influenced by the tide for several miles from their (one) mouth. Pliny relates instances of wells in cities near the sea being largely affected by the tides in his time. (*loc. cit.*, book ii., chap. 100.) Many an early settler has come to grief in crossing that place—

Wahaparata! I, myself, more than once, among the number; some having had to swim for it, themselves and their horses, when the water in the River Ngaruroro was high. [421]

Here I may briefly state that this word or name of *Parata* was also of great and ancient usage among the Maoris. The first time we hear of it was as the name of a principal chief, before the legendary period of their so-called migration hither to New Zealand; for thus it is stated in their legends:—

“Soon they fought; shortly after, peace was made; then they felled (the tree to build) the canoe ‘Arawa,’ this was done by *Parata*, by Wahieroa, by Ngahue.”³⁴¹

In the old myth of Maui transforming his brother-in-law Irawaru into a dog, and the widow, his sister (Hinauri), becoming distracted over the loss of her husband, she goes off to the rocky cliffs at the seaside to commit suicide, and there utters her mournful dying dirge, beginning thus:—

341 WC: Grey's “*Poetry of the New Zealanders;*” Korero-Apiti, p. viii

“Ever lamenting:—

Henceforth I (am) ever imploring
 To the stealthy-one³⁴² of the ocean,
 To the big *Parata* of the ocean,
 To the huge monster of the ocean,
 To the enormous whale³⁴³ of the ocean,
 That (he) may come hither
 That Hina may be swallowed up.”

So saying, she threw herself into the sea.

The word is also found in the ancient prayer or semi-incantation used by the *tohunga* at their old cannibal orgies, when initiating the young men and boys (chiefs' sons), in order to their partaking of the flesh of their enemies slain in battle. Thus it begins:—

“This youth present gnaws,
 This youth present strives,
 This youth present eats,
 This youth present eats man's flesh,
 This youth present swallows *parata*:”

which may mean “lords (of foes),” or “monsters,” or “great difficulties and dangers,” (or all together,) overcoming them as easily as “swallowing one's spittle” (a common Maori metaphor). The said long prayer or spell concludes thus:—

342 WC: Or, steep precipices in ocean's depths.

343 WC: Lit. *Paikea*, a large species of whale with a white belly, deeply grooved longitudinally; one was stranded on the beach near Napier about 1847; also a Maori name for a long house with the doorway in the end. (See Note, “*Trans. N.Z. Inst.*,” vol. xiv., p. 20.)

“This youth shall soon eat,
 This youth shall soon swallow man,
 Shall eat to-day,
 Shall eat to-morrow (hereafter),
 Sufficient now (for the first time) this youth shall eat.”
[422]

Parata is also the name of that part of a war-canoe that projects out at the bow, beneath the image or figure-head, and meets the rising waves; near this was the coveted seat or stand of the hero or warrior chief. Thus, the old song:—

“To stand firmly at the bow of the canoe (is to be) renowned.”

The term is also commonly used in their mournful poetical laments and dirges over their dead chiefs, in these (or similar) words:—

“The eddy-squall is over; the storm is passed away;
 The *Parata* is gone; the big fish has left its habitation.”

1888 A description of a species of *Orobanche* (supposed to be new) parasitical on a plant of *Hydrocotyle*. *Transactions of the New Zealand Institute* 21: 41-43.

[*Read before the Hawke's Bay Philosophical Institute, 12th November, 1888.*]

Orobanche hydrocotylei,³⁴⁴ Col.

PLANT erect, simple, 12 in.–18 in. high, cylindrical, rather stout, as thick at base as a large-size common lead-pencil, darkish purple-red; whole plant thickly glandular-pubescent; hairs short, patent, whitish, their globular tips yellow. Bracts scattered, few at base, very distant below on stem, $\frac{3}{4}$ in.–1 in. [42] apart, and (with flowers) mostly running in three lines; ovate-acuminate, dark-purple, many veined; tips recurved.

Flowers 20–40, loosely spiked on upper two-thirds of stem, distant throughout $\frac{1}{2}$ in.– $\frac{3}{4}$ in. apart, presenting a sub-decussate appearance, sessile; floral bract as long as corolla.

Calyx beneath only (corolla naked at top and sides), purple, ovate-acuminate, 2-leaved, each bilobed nearly to base; lobes long acuminate, unequal, the outer lobe twice the length of the inner one and half as long as corolla, sub-erect, divergent, their margins slightly and finely sub-denticulate and much ciliate.

Corolla sub-ascending, patent, arched, 7–8 lines long, cylindrical, mouth broadly dilated, margins recurved; the upper half purple above; base and sides white; veins dark purple; lips whitish dashed with purple, their margins irregularly denticulate or laciniate-toothed, wavy; glabrous within, shining; the upper lip projecting beyond the lower one, deeply emarginate or sub-bilobed, lobes rounded, sometimes slightly decurved; the lower lip larger, much recurved, sub-3-lobed, lobes nearly equal in length, the middle lobe shortest obtuse rounded, lateral

lobes large spreading puckered, with inner margins incurved and much rumpled and inflated, somewhat like two sub-calli, each with a large ochraceous spot or dash.

Stamens inserted near base of corolla, stout, glabrous, flexuous, about half as long as corolla; anthers reniform-orbicular, mucronate; light umber-brown. Style thick and dilated at top, glabrous, with a few (5–6) scattered microscopic glandular hairs near top. Stigma large, recurved, bilobed; lobes globular, spreading, purple, finely papillose; finally exserted. Ovary ovoid.

Hab. Parasitical on the roots of a small spreading *Hydrocotyle* (*H. sibthorpioides*, Col.), the foster plant originally brought from forests near Dannevirke, County of Waipawa; 1887: W.C.

Obs. This plant is in many respects a remarkable and interesting one; especially if (as I at present believe) it should prove to be a new species, as such has not yet been detected in this country, nor in the Southern Hemisphere. I will therefore briefly give its history:—

In 1887 I planted in a large-size flower-pot some *Pterostylis*, and *Thelymitra* tubers (these subsequently flowered), and with them a small neat *Hydrocotyle*, which I had also brought from the woods in the interior, as I wished to see its ripe fruit. The *Hydrocotyle* plant grew amazingly, throwing out scores of long filiform branches, 2 ft.–3 ft. long, and covered with flowers and fruit; and has proved to be—what I had supposed—a new species.³⁴⁵ Suddenly (early in September, 1888) [43] there appeared a large, closely-bracteated, purple head,

345 WC: *H. sibthorpioides*, Col. (Vide description in Art. V., p. 83.)

rising from among the thickly-overgrown *Hydrocotyle*, and in a few days two more, strongly resembling the purple heads of asparagus in colour and form, only these were densely pilose. These heads grew very fast, and were soon found to be a species of *Orobanche*. They were all very much alike, merely differing in height, and, consequently, in the number of their flowers: one attained the height of 18 in., with forty flowers; another 15 in., with thirty-three flowers; and the third, 12 in., with twenty flowers. And subsequently (about five to six weeks later) a fourth and similar one made its appearance. This plant differs considerably from all our British species (of which I have botanical drawings), and from the Australian “introduced” one described by Bentham (which is also European), and from several others whose descriptions I possess; still, there are more described, of which, however, I am ignorant, therefore this plant may yet come under one of these. I have no recollection of ever having seen the *whole* plant before; but, at the same time, I have a strong suspicion that I have noticed something arising from the thick beds of our largely-creeping pilose *Hydrocotyle* very much like what the heads of this plant were in their early incipient state.³⁴⁶ It is, however, new to science to find this parasite growing on *Hydrocotyle*; also, under cultivation; and then to have three (now four) together is equally rare.

346 WC: See, for instance, a notice of an abnormal vegetable form observed (not wholly dissimilar) under *H. concinna* (“Trans. N.Z. Inst.”, vol. xvii., p. 239). This *Orobanche* in its earliest stage might easily have been confounded with such in the gloom of the forests.

The foster plant, though exceedingly slender and delicate, is apparently as healthy and flourishing as ever.

**1888 A Description of some newly-discovered
Cryptogamic Plants; being a further
Contribution towards the making known the
Botany of New Zealand.**

Transactions of the New Zealand Institute 21: 43-80.

[Read before the Hawke's Bay Philosophical Institute,
12th November, 1888.]

ORDER IV.—MUSCI.

Genus 67.³⁴⁷ Hypopterygium, Bridel.

a. Leaves not mixed with bristles.

1. *H. vulcanicum*,³⁴⁸ sp. nov.

Root thickish, sub-rigid, 3-pinnately branched, much implexed; [44] branches alternate, distant, straight; tips flexuous, acute. Stem 1 in. high, pale, succulent, with red hairs in scattered dense bunches. Frond sub-flabellate-ovate, $\frac{1}{2}$ in. long, pinnately branched; branches few (4–9), simple, close not imbricate, pale-green. Leaves—lower on main stem, scale-like, distant, deltoid, entire,

347 WC: The numbers here attached to orders and to genera are those of the "Handbook of the New Zealand Flora."

348 *Hypopterygium didictyon* Müll. Hal.

apiculate; nerve 0, instead of a nerve longitudinal cells extending throughout to apex, and cells of lamina oblong-hexagonal: upper on main stem, close not imbricate, oblong-ovate, dimidiate, margined, slightly serrate on upper apical portion, more so on the anterior margin, tip much apiculate, biserrate: on branches, narrower acuminate: dorsal leaves on main stem, sub-orbicular, margined, much apiculate; nerve stout, extending two-thirds of leaf; cells clear, oblong, rather small, with minute cellules, smallest at margins, large at centre and base: leaves on branches narrower, broadly oval, entire, margin slightly uneven; tip very apiculate, the mucro long and flexuous.

Hab. Among stones and pumice, sides of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Owen.*

Obs. The roots of this little plant are curious, widely differing from those of other species of this genus, no doubt owing to its high, exposed, and arid habitat. I regret not receiving any fruiting specimens.

2. *H. marginatum*,³⁴⁹ sp. nov.

Stem 1½ in. long, sub-rigid, dry, flexuous, flattened, with distant small scarious scales, reddish with dark-red rootlets scattered in little bunches. Frond small, oblate-orbicular, ½ in. wide, with 16 short spreading branches, pale-green. Leaves close, imbricate, ovate, acute, apiculate, margined, a few minute teeth near tip; nerve stout, extending nearly to apex; cells small, regular, oval, with double walls and minute cellules; dorsal leaves on main stem deltoid-rotund, margined, entire, very

349 *Hypopterygium didictyon* Müll. Hal.

apiculate; nerve broad, strong, percurrent; cells small, oblong and rhomboidal, with minute cellules, very long at centre and base, smallest at margins; leaves on branches orbicular, strongly margined, minutely uneven, serrulate at tip, cuspidate, stout; nerve excurrent, stout, prominent.

Hab. With preceding, sides of Mount Tongariro; 1887:
Mr. H. Hill.

Obs. A single specimen picked out from among a lot of scrap and damaged mosses.

3. *H. flaccidum*,³⁵⁰ sp. nov.

Stem slender, $\frac{3}{4}$ in. high; branches simple, $\frac{3}{4}$ in. long, loosely spreading, soft, flaccid. Leaves—on stem, ovate, acute, serrate, cuspidate; on branches, ovate, acute, serrate: dorsal, [45] ovate, very acuminate, serrate: perichaetial, long, subulate, flexuous. Cells linear, long.

Hab. Dry sides of watercourses among small *Hepaticæ*, woods, Dannevirke, County of Waipawa; 1888: W.C.

Obs. Only one specimen of this very distinct species detected among my collected specimens.

Genus 71. *Hookeria*, Smith.

§ 2. *MNIADELPHUS*, C. Muell.

1. *H. semiserrulata*,³⁵¹ sp. nov.

Plant terrestrial, tufted; stems brownish, $1\frac{1}{2}$ in.– $2\frac{1}{4}$ in. high, 4 lines broad at top, tips curved; basal leaves small,

350 *Hypnodendron arcuatum* (Hedw.) Lindb. ex Mitt.

351 *Eriopus flexicollis* (Mitt.) A. Jaeger.

distant, with a number of brown rootlets implexed among them. Leaves on main stem sexfariously disposed, but quadrifarious on the lower part of branches, imbricate, light-green, transparent, wavy, recurved, broadly margined, the upper half and apex finely serrate, the lower slightly irregular but scarcely denticulate: lateral leaves oblong, spreading, 2 lines long, apiculate, base dimidiate: dorsal and ventral, orbicular, apiculate; binerved, nerves united and very stout at base, unequal, divergent, the longest extending one-third to two-fifths of leaf; cells hexagonal, smaller around margins, larger oblong and rhomboidal at base. Perichaetal leaves oblong-obovate, suddenly very acuminate, the narrow tip two-fifths the length of leaf, flexuous, tip acute, slightly margined and serrulate at apex; nerve 0; cells sub-linear-lanceolate, their ends thickened. Fruit-stalk $\frac{1}{4}$ in. long, pale-green, scabrid. Calyptra (young) narrow or straight, base fimbriate; tip obtuse, fimbriate with long wavy irregular whitish fimbriæ.

Hab. Low wet shaded woods, south of Dannevirke, County of Waipawa; 1888: W.C.

Obs. This plant dries both crisp and green.

§ 3. PTERYGOPHYLLUM, Bridel.

2. *H. sexfaria*,³⁵² sp. nov.

Plant large, terrestrial, gregarious. Stems stout, flattish, sub-erect, 3 in.– $3\frac{1}{2}$ in. high, $\frac{1}{2}$ in. wide at top; branches few; leafy from base. Leaves sexfariously disposed, not margined, largely serrate, tips obtuse; pale-green: lateral

352 *Pterygophyllum quadrifarium* (Sm.) Brid.

leaves oblong, dimidiate, 3 lines long, spreading, young tips bearing a reddish hue: dorsal and ventral, orbicular-ovate; nerve stout, extending three-fifths of leaf, bifid about the middle of leaf, colour same as leaf, but brownish-red at base. Cells large, orbicular, with clear minute triangular intermediate spaces. Perichaetial leaves small, sub-ovate-acuminate, entire; tips truncate, serrate; cells narrow oblong-lanceolate; nerve 0. Fruit-stalk (young) 5–7 lines long, stout, flexuous, red, glossy, five on a branch [46] and near each other. Calyptra long, narrow, smooth, the base slightly laciniate.

Hab. Boggy spots, low woods, south of Dannevirke, County of Waipawa; 1888: W.C.

3. *H. atrovirens*,³⁵³ sp. nov.

Plant terrestrial, loosely tufted, sub-erect, 1½ in. high. Stem simple (rarely branched), dark-coloured (young stems reddish-brown, glossy), stout, leafy, with many dark-brown rootlets at base. Leaves quadrifariously disposed, free, loosely imbricated at top, dark olive-green (young leaves green); margins entire, but under a powerful lens slightly and irregularly denticulate near tip, though not serrated; cells large, hexagonal-orbicular, but hexagonal-oblong at base, their centres blotched with irregular dark dots, very small at margins: lateral leaves spreading, 2 lines long, elliptic or elliptic-ovate, tip obtuse; nerve very stout, colour of leaf, extending two-thirds length of leaf, and slightly bifid near top: dorsal and ventral sub-orbicular, a little shorter than lateral. Perichaetial small, numerous, orbicular, apiculate, apex

353 Not found.

blunt and excised on each side, serrulate; cells smaller; nerve 0. Fruit-stalk very stout, $\frac{1}{2}$ in.– $\frac{3}{4}$ in. long, black, shining, curved, 4–6 on a branch, thick and bulbous at base. Capsule (old) small, 1 line long, oval, slightly tubercled at base, dark-brown, nodding. Calyptra (young) linear, sub-acute, $1\frac{1}{2}$ lines long, black, smooth, grey and slightly jagged at base. Antheridia, several at base of fruit-stalk, linear, swollen and brown at middle.

Hab. On the ground in a boggy spot in a low wood, south of Dannevirke, County of Waipawa; 1888: W.C.

Obs. This plant shrivels much and becomes black in drying. Its nearest affinity seems to be with *H. quadrifaria*, Sm., and *H. robusta*, Hook.f.

4. *H. flava*,³⁵⁴ sp. nov.

Plant small, $\frac{1}{4}$ in.– $\frac{1}{2}$ in. long, leafy to base, stems branched above, main stem and branches dark-red. Leaves yellowish-green, sub-quadrifariously disposed, thickly set, imbricate, $\frac{1}{2}$ line long, obovate-spathulate, apiculate, tapering to base, margined, entire, slightly uneven, very crisp when dry; nerve strong, single, flexuous, extending through four-fifths of leaf. Perichaetial few, erect, sub-linear-oblong, apiculate. Cells compact, orbicular, very minute at tips, larger at centre and increasing in size to base, where they are very clear parallelogrammatic and oblong-hexagonal. Fruit-stalk (immature) short. Calyptra smooth, beak very long.

Hab. Growing among and over *Zoopsis muscosa (infra)*, woods, Dannevirke, County of Waipawa; 1888: W.C.

[47]

ORDER V.—HEPATICÆ.

Genus 2. Jungermannia, Linn.

§ 1. Stipules 0: leaves entire.

1. *J. consimilis*,³⁵⁵ sp. nov.

Plant small, procumbent, tips ascending, simple and dichotomously forked, 1 in.–1½ in. long, scarcely 1 line wide, leafy throughout, the under side of stem densely clothed with fine rootlets. Leaves pale-green, close, imbricate, erect and conniving, very regular, triangular-ovate, much apiculate, narrowly margined; margins entire but uneven, slightly decurrent. Stipules 0. Cells numerous, small, orbicular, distinct, ranged in longitudinal lines, larger in centre and at base.

Hab. Growing half concealed in tufts of moss (*Leptostomum inclinans*, Br.) on branches of living trees, low woods, south of Dannevirke, County of Waipawa; 1888: W.C.

Obs. A species closely allied to *J. monodon*, Hook.f. and Tayl., but differing in size, colour, leaves broader, more largely and sharply apiculate, with their margins uneven, and with smaller and much more numerous cells.

355 *Cuspidatula monodon* (Hook.f. & Taylor) Steph.

2. *J. frullanioides*,³⁵⁶ sp. nov.

Plant pleasing green, prostrate, creeping, with numerous short dark rootlets in tufts on the main stem, 2 in.–4 in. long, 3-pinnately branched; branches alternate, numerous, close, spreading, slender, $\frac{1}{30}$ in. wide, very leafy. Leaves sub-opposite, close, imbricate, spreading, flat (concave and recurved when dry), broadly elliptic or sub-rotund, dimidiate, the upper portion finely serrulate, sub-apiculate, tapering to base and rather narrow there with a nerve-like thickening, obliquely set; the anterior basal portion overlapping stem; the posterior basal margin excised, slightly decurrent. Stipules 0. Cells very minute, sub-orbicular, regular, compact, very obscure.

Hab. On branches of living trees, forming small thick patches, woods near Dannevirke, County of Waipawa; 1888: W.C.

Obs. This is rather a peculiar looking species; it grows closely intermixed and thickly overrunning itself, having much of the habit and general appearance (at first sight) of some of our small *Frullaniæ*. Not having met with it in fruit, I place it under this genus with some doubt.

Genus 3. *Plagiochila*, Nees and Montagne.

§ 2. Stems sparingly branched.

1. *P. pallescens*,³⁵⁷ sp. nov.

Plant pale, slender, weak, drooping, $2\frac{1}{2}$ in.–3 in. long, $\frac{1}{20}$ in. wide, simple and 2–3 branched, leafy throughout;

356 *Jungermannia victoriensis* (Bibby) Hodgs.

357 *Plagiochila lyallii* Mitt.

[48] branches long, their tips much drawn out, flagellate, with their leaves very minute and distant. Leaves alternate, subobovate-elliptic, dimidiate, close not imbricate, lacinio-denticulate on two margins, the lower side entire and nearly straight and very slightly decurrent; teeth few (5–9), very irregular in length, two (sometimes three) outermost at tip very long and straight, their sinuses large and broad. Cells minute, orbicular, subopaque.

Hab. Forests near Lake Waikare, County of Whakatane; 1888; *Mr. A. Hamilton.*

Obs. A delicate species, with the habit of *P. laxa*, Lehm. and Lind.

2. *P. parkinsoniana*,³⁵⁸ sp. nov.

Rhizome long, wiry. Plant very slender; stems distant on rhizome, 2 in. long, 1 line wide, simple and forked; branches long, flexuous, leafy throughout. Leaves very minute at base and some distance up main stem, alternate, close not imbricate, sub-parallelogrammatic; tips truncate, 2-toothed, one at each angle, and generally one minute tooth (rarely two) just below on anterior margin, which is also slightly arched; posterior margin straight (sometimes slightly curved), entire, very slightly decurrent on dorsal side of stem. Cells minute, compact, obscure.

Hab. Dry sides of ravines, among other *Hepaticæ*, woods, Dannevirke, County of Waipawa; 1888: *W.C.*

358 *Plagiochila pleurota* H. & T.

Obs. A long, narrow, neat species, having affinity with *P. laxa* and its allies.

3. *P. intermixta*,³⁵⁹ sp. nov.

Stems very slender, erect, simple, and once-forked near base, dark-coloured, shining, 1 in.–1½ in. long, $\frac{1}{20}$ in. wide. Leaves brownish, alternate, distant, patent, sub-oblate-orbicular, oblique, rather free, only a small portion attached to stem and half-clasping, concave, largely denticulate all round save the extreme base; teeth distant, irregular, straight, acute and obtuse, cellular, sinuses rounded. Cells small, sub-quadrilateral, larger and oblong-quadrilateral at base.

Hab. On rotten logs, growing closely intermixed with *Gottschea* and other *Hepaticæ*, woods, Dannevirk; 1888: W.C.

4. *P. orbiculata*,³⁶⁰ sp. nov.

Plant diffuse, spreading, sub-erect, slender, curved, 2 in. long, 1 line wide, sub-bipinnately branched; branches few, very distant, simple, leafy throughout. Leaves alternate, close but not imbricated, orbicular, margins entire, slightly contracted at base with a nerve-like plait, patent, obliquely set on stem and decurrent across it, brownish-green. Cells [49] small, compact, sub-orbicular, larger at base, with thick irregular double walls and cellules in them.

359 *Adelanthus falcatus* (Hook.) Mitt.

360 *Plagiochila gigantea*.

Hab. On ground, sides of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. Only a few specimens of this very distinct species seen; picked out from among *P. alpina* (*infra*).

5. *P. subconnata*,³⁶¹ sp. nov.

Plant pale-brownish, slender, erect, 1 in.–2 in. high, 1½ lines wide, simple and once-forked (about middle), flexuous, leafy nearly to base, the leaves very small and distant below. Leaves opposite, orbicular, very nearly connate, $\frac{1}{15}$ in. diameter, margins slightly uneven, with a few (2–5) minute denticulations at top, sometimes sinuate only, wavy, sub-amplexicaul, patent, recurved, the lowest entire. Cells sub-orbicular, of two sizes, one large distant and clear, and one minute close and numerous surrounding the larger ones. Male spikes on the middle of branches, large (for plant), 2–3 lines long, with 9–14 pairs of scales, sometimes two spikes at a short distance from each other; tips recurved, entire.

Hab. Among other *Hepaticæ* and mosses forming patches on trees, woods near Dannevirke, County of Waipawa; 1888: *W.C.*

§ 3. Stems erect from a creeping rhizome, tall, much branched, dendroid.

6. *P. longissima*,³⁶² sp. nov.

Plant large, sub-erect and pendulous, sub-rigid, 4 in. high; stems black, leafy to base, branched above;

361 *Plagiochila conjugata* (Hook.) Dum.

362 *Plagiochila arbuscula* (Brid.) L. & L.

branches few, very long (2 in.–4 in.), 3 lines wide, bipinnate, sometimes subfascicled and opposite at middle of main stem, divergent; branchlets few, sub-opposite, spreading. Leaves brownish-green, sometimes green splashed with brown (giving out a brown colour in soaking), close, imbricate, concave, subtrapezoid-triangular, 1½ lines long; tips truncate, 3-toothed, with usually two teeth below apex on each margin, the rest entire and straight save 5–7 long flexuous ciliate teeth on basal anterior margin, which largely overlaps on stem, meeting and standing out like a ridge, their sinuses broad and rounded; posterior margin recurved lengthways, decurrent on stem, almost meeting at lowest points. Cells orbicular, with round interstitial cellules. Perianth (old) narrow oblong-ovate, mouth sub-truncate, obtuse, with a few coarse teeth. Cells linear-oblong, close together.

Hab. On trees, thick woods, Dannevirke, County of Waipawa; 1888: W.C.

7. *P. subpetiolata*,³⁶³ sp. nov.

Rhizome long, slender, branched, creeping. Plant [50] sub-dendroid erect, 1½ in. high; stem dark red-brown, shining, bare below, simple, also 3-branched about the middle, and sometimes dichotomous; tops of branches curviform. Leaves alternate, rather distant on stem, patent (appressed and conniving in pairs when dry, and then slightly imbricate), orbicular, 1 line wide, denticulate, pale-green, thickish, and coloured (reddish) at junction with stem, and only slightly adhering as if sub-petiolate, not decurrent; much smaller on tips of old branches,

363 *Adelanthus falcatus* (Hook.) Mitt.

which are drawn out and very acuminate. Cells minute, distinct, sub-orbicular, with dark walls; the centre and base of leaf black-dotted (microscopically) in transverse wavy lines. Fruiting specimens not seen.

Hab. Forests near Lake Waikare, County of Whakatane; 1887: *Mr. A. Hamilton.*

Obs. A peculiar neat-looking species, much resembling in general appearance of stems and leaves the drawing given of *Jungermannia falcata*, Hook. ("MUSCI EXOTICI," tab. 89), now *Adelanthus falcatus*, Mitten ("Handbook N.Z. Flora").

8. *P. spenceriana*,³⁶⁴ sp. nov.

Plant densely tufted; rhizome matted, creeping, wiry. Stems slender, erect, wiry, shining, sub-translucent, brown, somewhat dendroid in the large specimens, 2 in.—2½ in. long, 3 lines broad (including leaves), leafy to base with the leaves decreasing in size, simple and branched; branches few, lower (one or two) diverging, long, flexuous, (male plant) generally sub-fascicled above (top of main stem) into 4—5 erect equal branchlets, each bearing a terminal spike, linear-lanceolate, obtuse, flattish, canaliculate, distichous, 1½ lines long, 10—15 jugate, their edges rounded, tips of perigonial leaves entire and slightly decurved. Leaves distant, patent, alternate, decurrent on dorsal side, biformed, olive-green: those on main stem sub-orbicular, distantly cilio-serrate at apex and upper portion of anterior margin, the posterior margin entire, recurved, slightly amplexicaul, reddish at junction with a wavy rumple or twist owing to

364 *Plagiochila deltoidea* Lindenb.

leaf being set obliquely on stem: those on branches broadly obovate and much smaller. Cells very minute, orbicular, guttulate, crowded, obscure, with smaller cellules in their angles; slightly clearer and more regular at extreme base; those of perigonial leaves elliptic and black-beaded.

Hab. On trees, forests near Dannevirke, County of Waipawa; 1888: *Mr. H. Hill.*

Obs. I. This plant in its slender habit resembles *P. prolifera*, Mitt., although its main stems are both stouter and wider and its branches not proliferous, with leaves more closely and largely ciliate, alternate, and not coadunate; and its perigonial leaves are also entire. It is also allied to [51] *P. exilis*, Col., and *P. distans*, Col.,³⁶⁵ but differs in its entire perigonial leaves, &c., and also to *P. polystachya*, Col. (*infra*). The male spike resembles that of *P. brauniana*, Nees.

II. Sometimes 3–4 male spikes are found adnate on a single main stem, beginning at a little distance from the base, and so on from each other, with a few pairs of small leaves between them. A very graceful little species.

9. *P. polystachya*,³⁶⁶ sp. nov.

Rhizome creeping, long, much-branched. Plant erect, dendroid, stiff, 3 in. high; main stem woody, simple, 3½ lines wide, leafy to base, dark-brown, branched above; branches few, long, slender, spreading, alternately and equidistantly spiky, 4–6 on a branch, the leaves between

365 WC: "Trans. N.Z. Inst.", vol. xix., pp. 282, 283.

366 *Plagiochila arbuscula* (Brid.) L. & L.

them small. Leaves green, close, imbricate at bases, regular, patent, sub-deltoid, apex broad, rounded and truncate, with a few (4–5) short teeth, and 2–3 longer and more acute at anterior ventral base, sometimes 1–3 distant and minute ones on ventral lateral margin, which is overlapping; dorsal margin very oblique, straight, entire, largely decurrent; both margins wavy and recurved. Cells small, densely crowded, orbicular, each surrounded by a chain of very minute and clear cellules. Male spikes sub-lanceolate, 3–2 lines long, deeply sulcate on dorsal surface, turgid on ventral, brownish-yellow, lower ones 9–10 jugate, gradually decreasing in size (6–4 jugate) to top, and so their intermediate leaves; also, sometimes five together are fascicled at apex. Perigonial leaves rather large, tips recurved, sharply acute, and 2–3-toothed.

Hab. In deep woods, Dannevirke, County of Waipawa; 1888: W.C.

Obs. A species having affinity with *P. spenceriana* (*supra*), but differing in its larger and more robust size, in habit, in shape of leaves, and in the apices of the perigonial leaves being toothed.

10. *P. subflabellata*,³⁶⁷ sp. nov.

Rhizome creeping, main stems erect, dendroid, wiry, stiff, woody, leafy to base, 1½ in.–2 in. high, 3 lines wide, including leaves, but narrower at base and on branches; bipinnately branched at top; branches few, regular, spreading nearly at right angles, graceful, almost sub-flabellate. Leaves very thin, pellucid, lively green,

367 *Plagiochila fasciculata* Lindenb.

rather distant, not imbricate (young stem-leaves sub-imbricate), patent, 1½ lines long, sub-trapeziform (in outline), decurrent across stem; apex blunt, rounded; base sub-amplexicaul, wavy with a central hollow, convex, margins recurved; ventral and apical margins cilio-serrate, [52] teeth 14–16, irregular, rather distant, filled with minute cells; sinuses large, rounded, semicircular, the base much arched and overlapping stem; dorsal margins straight, entire, thickened, with rarely 1–2 very minute blunt (budding?) teeth on upper margin. Involucral leaves at tips of branches erect, broader and more largely ciliate. Cells crowded, of 2–3 kinds—(1) orbicular and clear, with minute cellules between them; and (2) beaded with black dot-like centres, these last mostly marginal.

Hab. Woods near Dannevirke, County of Waipawa; 1888: W.C.

11. *P. alpina*,³⁶⁸ sp. nov.

Plant sub-dendroid, 2 in.–2½ in. high, 2 lines wide; stems sub-succulent, 3-pinnately branched above; branches irregular, leafy, pale-green young, dark-coloured in age. Leaves sub-vertical, distant and smaller on main stem, sub-imbricate on branches, rotund, 1 line diameter, slightly dimidiate, set obliquely, contracted at base, slightly amplexicaul, much decurrent, concave and slightly plaited, toothed; teeth irregular, mostly alternately long and short, margins of both anterior and posterior bases entire. Cells compact, sub-orbicular, their walls thick and dark, with minute cellules in them.

368 *Plagiochila fuscella* (Hook.f. & Taylor) Taylor & Hook.f.

Hab. On the ground in tufts among other small plants, sides of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

12. *P. berggreniana*,³⁶⁹ sp. nov.

Plant largely tufted, sub-erect, densely overgrowing. Stems 1 in.–3 in. long, 2½ lines wide, light-brown, leafy to base, simple, forked and branched irregularly above; a sub-flagellate branch usually springs from base of perianth. Leaves light-green: those on main stem sub-opposite, regular, close not imbricate, spreading, sub-obovate-reniform, dimidiate, narrowest at base; tip obtuse and (with anterior margin) distantly toothed; posterior margin entire, straight and slightly curved, slightly decurrent: those on branches smaller and more distant, with fewer (3–4) teeth at apex. Involucral leaves similar to those on main stem, broader, erect, more toothed. Cells rather large, compact, obscure, oval and sub-orbicular, with minute interstitial ones. Perianth terminal and axillary between two divergent branches, obovate, mouth small, slightly and irregularly toothed, two of the teeth rather long and coarse. Fruit-stalk short, scarcely exserted. Capsule brown; valves oblong-lanceolate, sub-acute.

Hab. On trees, woods south of Dannevirke, County of Waipawa; 1888: W.C. [53]

Genus 5. Lophocolea, Nees.

369 *Plagiochila fasciculata* Lindenb.

1. *L. submunicata*,³⁷⁰ sp. nov.

Plant minute, creeping, simple, 1 in. long, $\frac{1}{20}$ in. wide, pale greenish-white, having a rough sub-muricated appearance; pinnatifid, lobes cut nearly to base, close but not imbricate, adnate, sub-trapeziform, broadest at base, tip truncate and sub-trifid, spiny ciliate at apex and on anterior margin; posterior margin entire and largely oblique; cells minute, circular, obscure, with a few scattered clear ones; ciliæ close, irregular, straight and branched, the sinuses very broad and rounded at bases. Stipules minute, capillary, forked, each ray compound of two or more branches.

Hab. On the ground among other and larger *Hepaticæ*, damp low forests, Dannevirke, County of Waipawa; 1888: W.C.

Obs. This is a very peculiar-looking plant, differing widely from other *Hepaticæ* I have seen: its almost jagged leaves and compound or branched spiny ciliæ give it a unique appearance. From not finding it in a fruiting state it is only provisionally placed under this genus, *Lophocolea*, as it may prove to be a *Leioscyphus* or a *Chiloscyphus*.

Genus 7. *Gottschea*, Nees.

Leaves stipulate.

1. *G. guttata*,³⁷¹ sp. nov.

370 *Cyanolophocolea echinella* (Lindenb. and Gottsche)
R.M.Schust.

371 *Schistochila repleta* (Hook.f. & Taylor) Steph.

Plant small, gregarious, sub-procumbent, broadly obovate, $\frac{3}{4}$ in.–1 in. long, 5 lines wide at top, simple, sometimes shortly branched below, leafy from base; rootlets numerous, very stout, wiry, dark-purple. Leaves close, imbricate; ventral lobe narrow ovate, irregularly laciniate-serrate, tip sub-acute; dorsal lobe extending two-thirds of leaf, tip truncate, the anterior base largely rounded and produced beyond leaf, the margin uneven with small and distant denticulations; the posterior margin nearly straight, and not near margin of ventral lobe, with a straight plait running from the lower corner of the tip to the margin of ventral lobe. Stipules large, sub-orbicular (in outline), narrowest at base, bilobed, each lobe truncate and laciniate, usually three laciniæ on each side and three at top; laciniæ curved, stout, 6–7 cells wide at bases, their tips acute; sinus deep, sub-cuneate. Cells very large, orbicular-elliptic, double-walled and guttulate, having a very peculiar and rich appearance, as if each cell were separately embossed.

Hab. Among mosses on decaying logs, low woods, south of Dannevirke, County of Waipawa; 1888: W.C. [54]

Obs. A species near to “*G. compacta*,”³⁷² Col. (“Trans. N.Z. Inst.,” vol. xix., p. 285), but differing in its smaller

372 WC: Here please observe and correct an error—or, rather, two errors—in vol. xix., “Trans. N.Z. Inst.,” pp. 284, 285, where two new species of *Gottschea* described by me are both specifically named “*compacta*.” And what makes it still worse is the fact that in vol. xvi., p. 349 (same work) is another new species of *Gottschea* also named “*compacta*.” How that error occurred in vol. xix. I do not know, but the species described on p. 284 should have been specifically named *laciniosa*, and that on p. 285 *gregaria*, which names please substitute for those thus erroneously given.

size, in its different habit of growth, in its lobes and stipules being less serrate and laciniate, and in the unique formation of its large cells.

2. *G. longiciliata*,³⁷³ sp. nov.

Plant gregarious, small, flat, spreading, broadly obovate, 1 in. long, 4 lines wide at top, mostly simple, sometimes with two short opposite branches near apex. Stem stout, dark-coloured, leafy to base; rootlets numerous, wiry, dark-purple. Leaves pale-green, much and closely imbricate, translucid; ventral lobe $\frac{1}{5}$ in. long, ovate, obtuse, entire, finely serrulate; dorsal lobe short, two-fifths length of ventral, tip truncate, wide, anterior margin ciliate, not produced beyond ventral; the posterior margin oblique and much within that of ventral, with a strong plait running from the lower angle of apex to the margin of ventral. Cells large, orbicular, double-walled, with minute cellules in their angles. Stipule large, sub-orbicular (in outline), $1\frac{1}{2}$ lines diameter, 4-fid, sinuses very broad, the two inner segments largest, much lacinio-ciliate; ciliae very long, flexuous, brownish-olive coloured, 10-celled, branched, their bases 2-celled laterally within ciliæ; cells oblong, narrow.

Hab. On the ground, low damp woods, banks of river, south of Dannevirke, County of Waipawa; 1888: W.C.

3. *G. longiseta*,³⁷⁴ sp. nov.

Plant gregarious, procumbent, $\frac{3}{4}$ in.–1 in. long, broadly triangular (in outline), tip acute, pinnately branched at

373 *Schistochila balfouriana* (Hook.f. & Taylor) Steph.

374 *Schistochila repleta* (Hook.f. & Taylor) Steph.

base; branches short, spreading. Stems stout, sub-succulent, leafy to base, thickly and coarsely matted below with dark-red rootlets. Leaves yellow-green, closely imbricated above, distant and smaller below, all margins laciniate-serrate, laciniae flexuous; ventral lobe 3 lines long, triangular-ovate, strongly plaited at lateral junction of dorsal lobe, the plait laciniate; dorsal lobe much smaller, and within both margins of ventral, tip oblique, acute, base rounded, sub-dimidiately-cordate; perichaetial leaves larger and broader, much and irregularly laciniate. Fruit-stalk 1½ in. long, slender, flexuous; capsule red-brown, linear-oblong, 2½ lines long; valves 2 lines long, [55] linear, minutely striate, tip sub-mucronulate. Stipule very-large (for plant), sub-quadrangular, 2½ lines wide, slightly bifid, sub one-fourth from tip, laciniate-serrate. Cells large, of various shapes and sizes, orbicular to narrow oblong, their walls double.

Hab. On rotten logs among ferns, where it forms large spreading patches, low woods near Dannevirke, County of Waipawa; 1888: W.C.

4. *G. heterodonta*,³⁷⁵ sp. nov.

Plant gregarious, light-green, sub-procumbent; stems and branches stout, succulent, 1 in.–1½ in. high, 4–5 lines wide at top, branched above, bipinnate, branches long, spreading. Leaves distant below, closely imbricated above, half-clasping, ventral lobe oblong-ovate, tip acute, sharply cut serrate, a thick plait from tip of dorsal, with small short plaits running to margin, and all the plaits denticulate on the under side of lobe; anterior margin

375 *Schistochila repleta* (Hook.f. & Taylor) Steph.

slightly toothed; posterior margin lacinate-serrate; dorsal lobe, anterior base arched, produced, denticulate, the bases overlapping each other on stem; tip sub-truncate, toothed; the posterior margin curved, thick, coarsely denticulate, and much within the margin of ventral. Cells large, oval, walls thick. Stipule broadly hippocrepiform, $1\frac{1}{2}$ – $2\frac{1}{2}$ lines wide, narrowest at base, bifid half-way down, lobes truncate, tips trifid, margins coarsely lacinate all round, each lobe with 5–10 broad laciniæ; sinus broad, rounded at base.

Hab. On rotten logs, woods near Dannevirke, County of Waipawa; 1888: W.C.

5. *G. steno-carpa*,³⁷⁶ sp. nov.

Plant bright yellow-green, gregarious, semi-prostrate and sub-erect; stems very stout, 1 in.– $1\frac{1}{4}$ in. long, forked at top, branches short, 4–5 lines wide; main stem narrower, with rootlets at base. Leaves close, imbricate, wavy, $3\frac{1}{4}$ lines long; ventral lobe semi-ovate, serrate, tip acute, with one short plait running from tip of dorsal lobe towards margin of ventral; anterior margin, the basal portion coarsely lacinate-serrate; posterior margin nearly entire, with 1–2 small distant teeth, bases overlapping on stem; dorsal lobe, tip narrow, truncate, with a long curved tooth at the upper angle; anterior margin somewhat coarsely serrate; posterior margin curved slightly within ventral, coarsely toothed. Involucral leaves erect, narrow oblong, largely lacinate; laciniæ wavy. Stipule bifid, lacinate. Cells large, clear, oblong, double-walled. Fruit-stalk slender, $1\frac{1}{2}$ in. long. Capsule

376 *Schistochila repleta* (Hook f & Taylor) Steph.

narrow linear, cylindrical, 3 lines long, brown; valves linear ligulate, sub-acute, with numerous broad longitudinal dark lines, and closer finer lateral ones; cells quadrate. [56]

Hab. On ground, forming large compact turf-like patches, low woods near Norsewood, County of Waipawa; 1886: W.C.

6. *G. mitteniana*,³⁷⁷ sp. nov.

Plant gregarious, pale, prostrate; stem thick, succulent, hairy beneath, with dark-red wiry rootlets in small detached bunches at bases of stipules, simple, sometimes once-branched near top, 1 in.–1½ in. long, 4 lines wide at top, oblong-ovate. Leaves amplexicaul above on stem, imbricate, dorsal bases largely overlapping and wavy, distant and smaller below; ventral lobe sub-oblong-ovate (lingulate), the apical half serrate, having 2–3 small laciniations on each side with thick diagonal plaits, tip obtuse, minutely sub-apiculate, the basal half of anterior margin produced, ciliate; ciliæ long, flexuous, branched; the posterior margin finely serrulate; dorsal lobe short, sub-trapeziform, truncate; anterior margin closely and finely serrulate, increasing at tip; posterior margin straight, distant from that of ventral lobe. Cells large, rather coarse and irregular, sub-orbicular and broadly elliptic. Stipule large, sub-flabelliform-quadrate, 4-lobed, sinuses deep narrow sub-acute, very much ciliate on all sides; ciliæ long, flexuous. Numerous stipellæ (phyllodia?) in the axils, the largest sub-quadrate, bifid,

377 *Schistochila balfouriana* (Hook f & Taylor) Steph.

tips truncate; the others narrow linear, and all largely and finely ciliate.

Hab. On ground at bases of trees, low wet woods, Norsewood, County of Waipawa; 1886: W.C.

Obs. A species somewhat resembling *G. balfouriana*, Hook.f. and Tayl., in general appearance, but leaves without lamellæ, and the whole plant much more ciliate, the ciliæ longer, flexuous and cellular; the basal anterior margin of leaf finely ciliate, and the phyllodia more numerous and hairy-ciliate.

7. *G. moniliformis*,³⁷⁸ sp. nov.

Plant gregarious, prostrate, obovate-oblong, $\frac{3}{4}$ in.–2 in. long, 4 lines wide at top, slightly branched, leafy to base, stem stout, dark-coloured, for three-fourths of length beneath covered with dense blackish-purple rootlets. Leaves close, much imbricated above; ventral lobe narrow ovate, obtuse, with two plaits running to margin from angles of tip of dorsal; the tip and apical half of anterior margin serrate, the basal half ciliate; the posterior margin entire; dorsal lobe short, three-fifths of ventral, tip truncate, broad, and toothed; anterior base rounded, produced beyond ventral and largely overlapping stem, with a few distant minute marginal teeth and 2–3 fine plaits, slightly denticulate on lateral line of posterior margin. Cells large, sub-orbicular, sometimes oval, clear, their walls broad and double, with minute cellules. Stipule [57] sub-flabelliform-orbicular, narrowest at base, deeply bifid (half-through) or quadrifid, the two outer lobes being smaller; sinuses

378 *Schistochila balfouriana* (Hook f & Taylor) Steph.

large, round; all sparingly (4–5) lacinio-ciliate, the lower sides of stipule with usually one straight, horn-like cilia on each; ciliæ very long, straight, acute, peculiarly moniliform or strangulated, their alternate cells wanting or reduced to a fine black thread. Cells of stipule large, oblong, clear, their walls thick, larger at margins and at bases of ciliæ. In the axils between lobes 3–5 small patent stipellæ (or phyllodia), each 3–4 laciniate-branched.

Hab. Woods, Great Barrier Island, Frith of River Thames; 1888: *Mr. C. P. Winkelmann.*

8. *G. epiphyta*,³⁷⁹ sp. nov.

Plant prostrate, creeping, flaccid, pale-green. Stems simple, and sparingly dichotomously branched, linear, 2 in. long, 3–3½ lines wide, leafy throughout, adhering its whole length beneath by its numerous dark-red rootlets. Leaves rather distant below, close and sub-imbricate above; ventral lobe narrow oblong, sub-acute; anterior margin serrate, with an auricle at base cilio-fimbriate, several plaits in the apical half, the two larger ones from below tip of dorsal lobe, running diagonally to a notch in each margin, the largest broad and raised, its edge denticulate; posterior margin serrate with a few notches, base ciliate; dorsal lobe semi-cordate, serrate, tip broadly truncate, coarsely serrate, base ciliate; anterior basal portion much rounded and produced far beyond ventral lobe, slightly overlapping on back of stem; posterior margin considerably within that of ventral. Cells large, sub-orbicular, irregular, compact, thick-walled with

379 *Chiloscyphus physanthus* (Tayl.) Mitt.

minute cellules. Stipule very large, sub-oblong-quadratae, 4–5-fid, cut half through, sinuses rounded, lobes large oblong, tips truncate, margins sinuate, much ciliatae; ciliatae long, flexuous, curly, 2-celled at bases and springing from marginal knobs; a row of ciliatae down centre of stipule from base of sinus; cells as in leaves, but coarser. Several small stipellae (phyllodia?) of finely-curved fimbriatae in the axils of leaves.

Hab. On trunks of tree-ferns, growing downwards, low wet forests near Norsewood, County of Waipawa; 1886: W.C.

9. *G. winkelmannii*,³⁸⁰ sp. nov.

Plant large, prostrate, horizontal, flat, narrow oblong or sub-oblong-lanceolate, 3 in. long, 9 lines wide, tip broad, tapering and leafy to base, usually simple—a few specimens seen 1-branched about the middle, with numerous long pink rootlets from the middle and base of the stem. Leaves pale-green, membranous, imbricate; ventral lobe 4 lines long, sub-oblong-lanceolate, tip acute, the upper portion [58] (both sides) deeply laciniatae and finely toothed, the basal anterior margin distantly lacinio-ciliatae, their sinuses broad and curved, the basal posterior margin entire; dorsal lobe half as long, tip acute, its basal anterior margin much arched, produced beyond margin of leaf and very minutely serrulate, sub-auricled and largely overlapping on stem, auricles sub-erect and recurved; the posterior margin considerably within the margin of the ventral lobe; both lobes a little plaited diagonally. Cells of various sizes, oblong-

380 *Schistochila appendiculata* (Hook) Dumort ex Trevis.

orbicular not clear, walls thick, smaller and distinct at margins. Stipule large, orbicular (in outline), 2 lines diameter, bifid two-thirds of depth, the basal portion plaited, each segment truncate, sub-tripartite (2-lobed on the outer and 1-lobed on the inner margin), edges recurved, largely lacinio-ciliate; laciniæ curviform; sinuses large, rather broad, their laciniæ and ciliæ crossing each other and them. Cells oblong-orbicular, clear, their walls very thick.

Hab. On rotten wood, forests, Great Barrier Island, Firth of Thames; 1888: *Mr. C.P. Winkelmann.*

Obs. A fine species, having affinity with *G. appendiculata*, Nees, but differing in several particulars, as in size, habit, short stipe, and being leafy to base; the leaves narrower and plaited; the ventral lobe having shallower laciniæ in the upper portion, and deeper and curved ones in the lower anterior margin; the dorsal lobe more produced, minutely serrulate, and auricled; the stipules, also, larger, more divided, and lacinio-ciliate.

Genus 8. *Chiloscyphus*, Corda.

§ 1. Leaves opposite, stipules united to both the leaves below them.

1. *C. epibrya*,³⁸¹ sp. nov.

Plant large, creeping, 3 in.–3½ in. long, 2½ lines wide, simple and branched, usually 3-branched at top, and sometimes these again slightly forked at tip, leafy throughout, very membranous, pellucid, delicate pale-green. Leaves opposite, close, imbricate, patent, sub-

381 *Chiloscyphus coalitus* (Hook.) Nees.

trapeziform, very broad at base, narrowly decurrent, long and diagonal on dorsal surface of stem, tip truncate with one horn at each outer angle, the horns 4-celled, spreading, the sinus sub-sinuate and slightly produced not incised, margins delicately thickened. Cells pentagonal and sub-orbicular, with large clear double walls, and narrow linear interstitial cellules. Stipules large, sub-orbicular, 6-toothed, teeth large, connate with leaves below, the base of stipule hollow and rounded, with many fine rootlets.

Hab. Overrunning mosses, on the ground, wet thickets, Taupo, and interior. [59]

Obs. A species allied to *C. colensoi*, Mitten ("Handbook N.Z. Flora," p. 753).

2. *C. spruceana*,³⁸² sp. nov.

Plant prostrate, creeping, 1½ in.–2 in. long, 2 lines wide, very pale-green; simple and with 1–3 short lateral branches; the under surface of stems clothed with very fine rootlets. Leaves opposite, close, imbricate, patent, 1 line long, sub-trapeziform or broadly pyramidal with the apex (one-fifth) cut off, very truncate, straight or slightly sinuate, 2-ciliate-horned, one at each outer angle, margined; margins entire and straight; very broad at base, decurrent. Cells very large, sub-quadrangular or sub-pentagonal, their walls double. Stipules large, sub-quadrangular-reniform, with five (rarely six) cilio-fimbriæ, long, flexuous, subulate, 6–8-celled, the two lower cells

382 *Chiloscyphus coalitus* (Hook.) Nees.

geminate; connate rather broadly on both sides with leaves. Sinuses very large and broad at base.

Hab. Growing over and closely adhering to patches of *Lepidozia leucocarpa* (*infra*), low woods, Dannevirke, County of Waipawa; 1888: W.C.

Obs. The outline of leaf resembles that of *Lophocolea ciliata*, Mitt.

3. *C. ammophila*,³⁸³ sp. nov.

Plant prostrate, spreading, dichotomously branched at top, 1½ in.–2 in. long, 3 lines wide at middle of main stem, 2 lines on branches, dusky dark-green, but when young light-green. Leaves imbricate throughout, deltoid-rotund, dimidiate, very wavy, shining, entire, margined, with a strongly-marked horizontal green line running towards apex; tip rounded, obtuse and sub-acute; decurrent on dorsal stem and meeting at their extreme bases. Cells sub-orbicular, walls double with minute cellules, oval and larger at centre. Stipule large, connate on both sides, reniform, concave, recurved, ciliate-toothed; teeth few, distant, smaller at the ends.

Hab. On the ground with other small plants, sandy spots, sides of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill*.

4. *C. vulcanica*,³⁸⁴ sp. nov.

Plant small, sub-erect, simple and forked at base, sub ½ in. high, $\frac{1}{20}$ in. wide. Leaves very close, slightly

383 *Chiloscyphus ammophilus* Col.

384 *Lophocolea leucophylla*

imbricated, regular, spreading, sub-deltoid, apex truncate straight, 2-horned (the upper one generally longer and curved), dimidiate, sides slightly rounded, irregularly ciliate-toothed, teeth straight; ventral margin produced at base and more ciliate, ciliæ curved. Stipule large (for plant), oblong-quadrata, retuse with ten long teeth, six at top and two at each side, connate with leaf below on both sides; margined, edges and [60] tip coloured brown. Cells large, clear, sub-orbicular with a central bead, and minute cells in the angles.

Hab. Among other *Hepaticæ* and low mosses, on the ground, sides of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

5. *C. marginata*,³⁸⁵ sp. nov.

Plant pale, prostrate, creeping, 2 in. long, stems 1½ lines wide, simple, and forked at tips. Leaves very membranous, sub-opposite, close, half imbricated, margined, sub-rotund-quadrata above on stem, deltoid, below their bases very broad; tips broad, emarginate and obtuse, wavy, recurved, decurrent and slightly diagonal on dorsal surface of stems, with their extreme ends overpassing. Cells compact, orbicular, dotted each with 2–5 spots, walls narrow but double with minute interstitial cellules. Stipules bifid, margins uneven; lobes long, acuminate, flexuous, with two long laciniate flexuous teeth on each outside near base; connate with leaf, largely amplexicaul. Sinus very large, sub-acute, spreading, with sometimes a tooth, and many small white rootlets from base.

385 *Lophocolea heterophylloides* Nees.

Hab. On ground, among mosses, wet woods, Taupo.

§ 3. Leaves opposite or alternate, stipule free.

6. *C. venustula*,³⁸⁶ sp. nov.

Plant small, delicate, horizontal, creeping, 1 in.–2 in. long, scarcely 1 line broad, simple, and slightly branched near base; stems dark-coloured, wiry, rooting under each stipule. Leaves darkish, clear, pinnate, sub-opposite, subquadrate, adnate, detached not imbricate, the apex broadly rounded with three equidistant spiny ciliæ, which are two-fifths length of lamina, straight and celled. Cells large, sub-orbicular, clear. Stipule small, free, of three spreading rays, celled. Fruit not seen.

Hab. Among mosses, &c., on ground, sides of Mount Tongariro, East Taupo; 1887: *Mr. H. Hill.*

Obs. An elegant little and extremely delicate species; its manner of growth serving to show to advantage its rather peculiar and striking segments, with their long, straight, outstanding ciliæ. Not having met with it in a fruiting state, it is provisionally placed under this genus, as it may prove to be a *Lophocolea*; but, from its appearance and its rooting under the stipules, I believe it to be a *Chiloscyphus*. I only obtained a few specimens, laboriously picked out from other small cryptogams, and cleaned from pumice-dust.

386 ? *Chiloscyphus triacanthus* Tayl.

7. *C. insula*,³⁸⁷ sp. nov.

Plant small, gregarious, erect, $\frac{1}{2}$ in. high, mostly simple, sometimes one-branched, broadest at top, tips recurved; 2–3 [61] stout flagellæ descending from middle of stem. Leaves closely imbricate, wavy, yellowish-green, broadly sub-oblong-ovate, entire, sometimes minutely, distantly, and irregularly denticulate. Stipules narrow reniform-oblong, contracted at base, sub-amplexicaul, margins irregular, slightly and distantly toothed. Cells large, orbicular, dotted, with minute cellules in their angles. Perianth basal, shortly peduncled, green, campanulate; mouth lacinio-ciliate, flexuous; involucral leaves—inner, small, entire; outer, erect, trifid.

Hab. On rotten wood, among mosses, forming spreading patches, forests, Great Barrier Island, Firth of Thames; 1888: *Mr. C. P. Winkelmann*.

8. *C. lingulata*,³⁸⁸ sp. nov.

Stem procumbent, creeping, simple, straight, 1 in.– $2\frac{1}{2}$ in. long, 3 lines wide (in the larger specimens), spreading and growing over each other, stoutish, brown, shining, pinnatifid; lobes (or leaflets) of two sizes on stem, the lower being much smaller; cut nearly to rhachis (sometimes distinct), adnate, scarcely decurrent, alternate and sub-opposite, sub-imbricate, oblong-lingulate, entire, both margins nearly straight, the lower slightly oblique; tips rounded, very obtuse, with occasionally a very

387 *Chiloscyphus ammophilus* Col.

388 *Lophocolea planiuscula* Tayl.

minute microscopical tooth or horn at the anterior apical corner; the segments in the small branches having their tips more truncate, and often minutely 2-horned, one at each of the outer angles; pale whitish-green. Cells large, compact, sub-quadrilateral, with free, thickish, dark rings within them. Stipules rather large, spreading, distant, bifid; tips acuminate, acute; sinus broad, the base rounded, each lobe 3–4 denticulate-ciliate; generally placed centrally under the upper lobe of a quasi pair of leaves, and sometimes at their junction on stem. Cells large, orbicular, clear, with a thick bunch of long flexuous white rootlets at base of each stipule. Perianth peduncled on ventral side near base, 4–5 pairs opposite and near each other, short, stout; perianth green, lobes long acuminate, laciniate, curved.

Hab. On the ground, damp shady forests near Dannevirke, County of Waipawa; 1888: W.C.

Obs. A species having close affinity with *C. supinus*, Hook.f. and Tayl., and also with *C. polycladus*, Mitt. This peculiarity of its leaves being biformed, and bidentate on the smaller (or younger) branches, has also been noticed to obtain in the allied form *C. supinus*—viz.: “in ramis junioribus folia abnormalia varie bidentata” (“Fl. Nov. Zeal.,” vol. ii., p. 142).

9. *C. epiphyta*,³⁸⁹ sp. nov.

Plant small, delicate, simple, and forked, $\frac{3}{4}$ in.–1 in. long, 1 line wide, pale-green. Leaves close, scarcely imbricate, [62] sub-oblong-quadrate, broadest at base, tip truncate, with a long cilia-like spreading tooth at each angle

389 *Chiloscyphus physanthus* Tayl.

(sometimes, also, a similar tooth in the middle of sinus), sinus excised, irregular, broad and deep, margin entire; anterior margin slightly arched, and depressed near tip; posterior margin straight. Cells large, orbicular, walls double with connected linear cellules. Stipules free, small, largely bifid; lobes long, flexuous, recurved, spreading, each with 3–4 basal longitudinal geminate cells, and two small teeth on the outside; sinus very large. Perianth sessile, erect, often two together near base, campanulate; tips largely laciniate, recurved. Calyptra globose, urceolate, mouth laciniate. Fruit-stalk 8–9 lines long; valves oblong, obtuse, brown.

Hab. On trunks of tree-ferns (*Dicksonia* sps.), low wet woods near Norsewood, County of Waipawa; 1886: W.C.

10. *C. montana*,³⁹⁰ sp. nov.

Plant small, prostrate, simple, linear, flexuous, very delicate, sub $\frac{1}{2}$ in. long, 1 line broad. Leaves sub-opposite, close, oblong-quadrata, sides straight entire; tips truncate, irregularly ciliate-toothed; teeth 2–5 (usually 4), straight, spreading. Cells large, clear, oblong-hexagonal, regular in almost lateral bands. Stipule small, free, broadly ovate, bifid; lobes acuminate, forked; sinus large, rounded; ciliæ few; cells as in leaves.

Hab. On ground with other small *Hepaticæ*, sides of Mount Tongariro, County of East Taupo; 1887: Mr. H. Hill.

Obs. This plant in its young state is whitish pellucid, leaves with fewer and more distant teeth; when aged it is

390 *Balontiopsis diplophylla* Tayl.

longer, dark-brown, more flexuous and sub-rigid, with its leaves more distinct: unless these, from more copious and better specimens, should form two species.

11. *C. heterodonta*,³⁹¹ sp. nov.

Plant prostrate, stems stout, about 1 in.–1½ in. long, lanceolate, 2 lines wide at middle, simple, and branched at base. Leaves green, sub-imbricate at middle of stem, oblong-quadrata; tips bifid (sometimes irregular) and much ciliate; lateral margins entire, but some leaves have one long ciliate tooth at the middle of the anterior lateral margin, or (but more rarely) one on the posterior margin. Stipule minute, free, narrow ovate, bifid, and sometimes trifid, with six ciliæ, three on each side. Cells large, clear, oblong-hexagonal.

Hab. With preceding, *C. montana*, Col.

Obs. This plant possesses several characters in common with *C. montana*, while it differs in others, which are also constant. Better specimens are wanting. I picked out both from a quantity of broken vegetable *rejectamenta*. [63]

12. *C. compacta*,³⁹² sp. nov.

Plant small, sub-erect, ¾ in.–1 in. long, 1½ lines wide, mostly simple, sometimes 2–4 branched; branches short, tips recurved, leafy throughout; pale-green. Leaves sub-opposite, closely (one-third) imbricated above, less so below, sub-rotund and sub-orbicular-quadrata, margined, entire; tips broad, sub-sinuate, and slightly sub-emarginate. Cells large, orbicular, clear, with minute

391 *Balontiopsis diplophylla* Tayl.

392 *Chiloscyphus compactus* Col.

cellules in their angles. Stipules small, free, distant from bases of leaves, broadly ovate, 4-laciniate toothed; teeth flexuous, sharp, a middle one very long.

Hab. On the ground in wet woods in the interior, Taupo, &c., forming pretty large compact patches.

13. *C. dicyclophora*,³⁹³ sp. nov.

Plant small, sub-erect, $\frac{3}{4}$ in.–1 in. long, $\frac{1}{2}$ line wide, simple, and slightly branched; of a pleasing green, with yellow recurved tips. Leaves densely imbricate, recurved, semi-rotund; anterior margin arched and with apex toothed, 10–12 blunt teeth; posterior margin produced at base, forming a complete circular dot-like auricle, which is doubled. Cells large, orbicular, walls thin with minute interstitial cellules in angles, also obscurely beaded.

Stipules distant, narrow (sub-linear), reniform, clasping, with a hollow circular centre showing the stem, their ends free, obtuse, each terminating in a complete circular dot like those of leaves. Perigonial leaves, near base, sub-flabellate, erect, toothed, with linear, brownish, antheridia in threes, within a sub-campanulate receptacle with fringed margins.

Hab. Low wet woods, Dannevirke, County of Waipawa; 1888: W.C.

Obs. A curious and pretty plant, nearly allied to *C. cymbaliferus*, Hook.f. and Tayl.

Genus 11 (1). *Tylimanthus*, Mitten.

393 *Chiloscyphus cymbaliferus* (Hook.f. & Tayl.) G. L. & N.

1. *T. novæ zealandiæ*,³⁹⁴ sp. nov.

Plant gregarious; root creeping, long, stoutish, simple, naked. Stems sub-erect and drooping, 3 in.—4 in. high, simple, and few-branched; stipe 1 in. long, bare below, with distant small leaf-like scales on its upper part; branches long, 1½ in.—2½ in. (sometimes two together from one base), 4—5 lines wide, linear, drooping, leafy throughout; pale yellowish-green. Leaves alternate, pinnate, very membranous, wavy and obliquely set, distant and small on lower part of branch, increasing in size upwards, close above, and sub-imbricate in middle of branch, semi-cordate-ovate, dimidiate, 3 lines long, 2 lines wide at broadest part near base, with several small marginal plaits; decurrent on dorsal side, their basal ends crossing; margins finely serrated, the basal portions entire, [64] that of anterior margin much rounded, of the posterior straight; tips sub-truncate, retuse and very obtuse. Cells obscure. Involucre terminal, between two small narrow sub-vertical leaves, on a short simple stem, nodding, affixed by its base, cylindrical, 3½ lines long, 1 line wide, glabrous, or finely and sparingly pulverulent; light-brown.

Hab. On the ground in wet spots, low woods, near Norsewood, County of Waipawa; 1886: W.C.

Obs. This is our largest (known) New Zealand species, and is also very distinct. Its larger leaves when flattened have a peculiar outline, closely resembling the profile of a large dog's head (setter); the retuse portion near the

394 *Tylimanthus saccatus* (Hook. Senr.) Mitt.

posterior margin, with its plait, forming the mouth, and a larger plait the eye.

Genus 11 (4). *Balantiopsis*, Mitt.

1. *B. glandulifera*,³⁹⁵ sp. nov.

Plant prostrate, horizontal, flat, spreading, 1½ in.–2 in. long, 2 lines wide, slightly irregularly branched; stems thickish, rooting at stipules; rootlets long, flexuous, white and purplish; branchlets ¾ in. long, pinnate, leaves nearly free, slightly imbricate, pellucid, pale, pinkish at tips, as also at stipules, broadly elliptic, obtuse; posterior margin crossing above on stem, laciniate lobed; sinuses broad, sub-margined, ciliate; ciliæ obtuse, celled, two cells wide at base. Stipules sub-flabellate in outline, 5-fid, laciniate-ciliate. Cells large, oblong-hexagonal and parallelogrammatical, sub-orbicular at margins. Torus pendulous near apex, oblong, cylindrical, obtuse, 1–1½ lines long, hairy; hairs short, purple-pink, glandular, with globular dark-pink tips.

Hab. Among other *Hepaticæ* on the ground, Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. An interesting little species, having affinity with *B. (Gymnanthe) diplophylla*, Mitt., but differing in several characters. I have only detected two fruiting specimens: like other allied species and genera,³⁹⁶ fruiting specimens seem to be very rare.

Genus 11 (5). *Marsupidium*, Mitt.

395 *Balantiopsis montana* (Colenso) J.J. Engel & G.L.S. Merrill.

396 WC: "Trans. N.Z. Inst.", vol. xix., pp. 286, 287.

1. *M. epiphyta*,³⁹⁷ sp. nov.

Rhizome creeping. Plant gregarious, small, delicate; stems simple, forked and branched at bases, 6–8 lines long, 1 line (or less) wide, linear, flexuous, prostrate. Leaves pinnate, sub 20 jugate, alternate, distant, adnate, decurrent, sub-linear-spathulate, broadest at top, the lower ones very minute sub-oblong-quadrata, margins slightly uneven; the anterior margin arched, the posterior straight; tips bifid, lobes irregular [65] acuminate, sharp, the upper one larger; sinus broad, with several very minute teeth on lobes and anterior apical margin. Cells (in young leaves) small, compact, sub-orbicular, walls thick with cellules in them; in old leaves obscure and beaded. Involucra at bases and at forks of branches, small, triangular-ovoid, 1 line long, brownish, glabrous, hairy at top, with a few scattered hairs below; hairs white.

Hab. Epiphytical on trunks of tree-ferns, low wet woods near Norsewood, County of Waipawa; 1885: W.C.

Obs. A species very near to (?)*Tylimanthus perpusillus*, Col. ("Trans. N.Z. Inst.", vol. xix., p. 286).

Genus 13. *Lepidozia*, Nees.

1. *L. elegans*,³⁹⁸ sp. nov.

Plant small, pale, slender, delicate, creeping, ¾ in. long, ½ line wide, simple, and pinnately branched; main stem stoutish for size of plant, with straight longitudinal lines and cells; branches alternate, irregular, 3–4 lines long.

397 *Marsupidium epiphytum* Col.

398 *Lepidozia centipes* Tayl. & Syn.

Leaves alternate, close but not imbricate, horizontal, oblong-quadrata, sides straight, entire, tips truncate 3-ciliate; ciliæ three-fourths of length of leaf, subulate, acute, straight, extended, 4-celled; their sinuses rather broad and bases subangular. Cells large, sub-quadrata, distinct, walls thick, usually disposed in 6 lines with 6 cells in a line—sometimes, but rarely, less. Stipules minute, 3-rayed, with a dark-coloured knot or node, and fine short rootlets.

Hab. On rotten wood, forests, Great Barrier Island, Firth of Thames; 1888: *Mr. C. P. Winkelmann.*

Obs. I. An elegant and curious little species, pretty closely allied to *L. centipes*, Tayl. (a Tasmanian plant), with which it may easily be confounded at first sight, but differing from that species in many characters, as in the main stem having differently-formed and longer cells; in the leaves having a less number of cells, with *no long basal cells* (double size), which are so very conspicuous in *L. centipes*, and only three (not four) ciliæ, with their bases usually single-celled; and in the stipules being 3-(not 4-) rayed.

II. In the very full and clear description of *L. centipes* given by Lindenberg and Gottsche ("Species Hepaticarum," pp. 29, 30), they say: "Folia quadrifida fere ad medium; laciñiæ sub-rectæ, quaternis cellulis, singula serie dispositis, binisque fultis constant.... Cellulæ foliorum basales reliquis fere duplo longiores unde singularem adspectum, cum aqua non cito penetrantur, præbent." Which their accompanying drawing and dissections also clearly show.

2. *L. leucocarpa*,³⁹⁹ sp. nov.

Plant very small, densely tufted, main stem creeping, [66] $\frac{1}{2}$ in.– $\frac{3}{4}$ in. long, branched; branches 1–2 lines long, erect, close, opposite and alternate, flexuous, simple forked and pinnate, few-leaved. Leaves 3-fid, lobes long, subulate, and spreading, 5–6 celled; lamina very short, 2 cells deep, cells narrow linear. Perichaetial leaves larger and broader, ovate, tip laciniate. Stipule closely resembling leaves, only smaller in size. Perianth terminal and basal, large for plant, 2 lines long, whitish, lanceolate, plaited above, cells linear, parallelogrammic, clear; mouth lacinio-fimbriate (usually twelve fimbriæ, their cells very long). Fruit-stalk $\frac{1}{2}$ in. long. Capsule small, brown-red; valves sub-linear-lanceolate, margined, obtuse, with longitudinal parallel stout dark lines, and latitudinal fine brown ones; cells narrow parallelogrammic.

Hab. On the ground in low wet woods, forming thick spreading patches, near Norsewood, County of Waipawa; 1885: W.C.

Obs. A very peculiar-looking and striking little species, from its numerous long white perianths, which are very conspicuous owing to their erect position above the plant, their size, and colour.

399 *Telaranea lindenbergii* (Gottsch.) J.J.Engel & Merrill var.
lindenbergii.

3. *L. minutissima*,⁴⁰⁰ sp. nov.

Plant very small, exceedingly slender, 1 in.–2 in. long, $\frac{1}{60}$ in. broad, prostrate, creeping, bipinnate, much branched; branches alternate, irregular, some very long for plant, and some ending with flagellæ; pale-green when fresh, but of a light-brown afterwards. Main stem (and flagellæ) translucent, composed of longitudinal parallelogrammic cells. Leaves distant on main stem, close together and patent on branches and branchlets, 3-rayed, cut nearly to base, the minute lamina composed of two small cells; segments capillary, sub-articulate, acute, spreading, 6-celled, the lowermost geminate. Stipules similar but smaller, with fine white rootlets descending from their bases.

Hab. On rotten logs among other *Hepaticæ*, particularly *Gottschea* sps., creeping between and over its leaves; forests near Dannevirke, County of Waipawa; 1888: W.C.

Obs. A peculiar and minute, almost microscopical, plant; its known affinities are with *L. lindenbergii*, Gottsche, and *L. capillaris*, Lind.

Genus 14. *Mastigobryum*.

1. *M. heterodontum*,⁴⁰¹ sp. nov.

Plant creeping, 2 in.–3 in. long, $1\frac{1}{2}$ lines broad, stout, leafy to base, dichotomous; branches spreading at right angles; flagellæ stout, short. Leaves brownish-green,

400 *Telaranea lindenbergii* (Gottzsche) J.J.Engel & Merrill var. *lindenbergii*.

401 *Bazzania adnexa* (Lehm. & Lindenb.) Trevis. .

thickish, opaque, closely imbricated, sub-trapeziform, very broad at base, dimidiate, truncate, falcate, recurved, 3-fid, teeth [67] irregular (and so sinuses), long and short, acute and blunt, margins sub-repand with minute denticulations about apex; anterior margin much arched; posterior nearly straight, a little excised. Cells sub-orbicular-oblong, distinct, guttulate, obscure. Stipules patent, recurved, sub-quadrata, broadest at base and closely approaching bases of leaf but not joined, top truncate, sub 4-fid, each coarse tooth (or small lobe) again serrate, sides denticulate. Cells narrow oblong and clear at margins, smaller and more compact (yet distinct) at centre and base.

Hab. Woods near Lake Waikare, County of Wairoa; 1888: *Mr. H. Hill.*

Obs. Only three specimens received, mixed with other *Hepaticæ*.

2. *M. vulcanicum*,⁴⁰² sp. nov.

Plant stout, dichotomously branched, (?) 2 in.–3 in. long, 1½ lines wide, dark-coloured, flagelliferous; flagellæ wiry, rigid, branched. Leaves brown, thickish, rather opaque, falcate, close-set, narrow oblong, broadest at base, with their slightly-produced anterior margins near base a little over-lapping; tips truncate with many acute teeth, the three principal ones large and sub-spiny; the lateral margins slightly denticulate below apex; anterior margin a little arched; the posterior one slightly incurved, and excised at an obtuse angle near base. Cells distinct, guttulate in longitudinal lines, alike throughout. Stipules

402 *Bazzania adnexa* (Lehm. & Lindenb.) Trevis. .

distant, sub-quadrata, much recurved, their tips and sides largely and irregularly toothed inclining to spiny.

Hab. Among small tufts of other *Hepaticæ* and mosses, on the ground, Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. A species near to *M. olivaceum*, Col. ("Trans. N.Z. Inst.", vol. xix., p. 290).

3. *M. smaragdinum*,⁴⁰³ sp. nov.

Stems rather stout, cellular, 1 in. long, sub-flabellately branched; branches forked, pinnate, very leafy throughout, much flagellate; flagellæ flexuous, stout, scaly. Leaves dark grass-green, shining, numerous, imbricate, oblong, dimidiate; tip 2-lobed, the upper lobe larger, sinus wide; margins entire but slightly uneven, the anterior one arched excised at apex, the posterior nearly straight. Cells large, very regular, sub-orbicular with minute interstitial orbicular cellules at their angles, oblong and a little larger at extreme base. Stipule free, distant, appressed, sub-quadrata, 3-fid, lobes stout, obtuse; cells as in leaves. Male inflorescence near base of stem, pedicelled, 4-5 nearly together; perigonial leaves very [68] cellular, forming a narrow cup, sharply lacinate, white with pinkish bases, enclosing 8-10 sub-cylindrical sacs.

Hab. Among other *Hepaticæ* and overrunning them, on decaying logs; woods south of Dannevirke, County of Waipawa; 1888: *W.C.*

403 *Acromastygium colensoanum* (Mitt.) Evans.

Obs. A species very near *M. colensoanum*, Mitt., but differing in colour, and in form of leaves, stipules, and cells: also, near to *M. amænum*, Col. ("Trans. N.Z. Inst," vol. xix., p. 288), but differing in colour and position of leaves, and largely in form of stipules and of cells. A very pleasing little species.

Genus 16. *Isotachis*, Mitten.

1. *I. elegans*,⁴⁰⁴ sp. nov.

Plant small, erect, $\frac{3}{4}$ in.–1 in. high, stem short irregular simple and 1-branched with innovations; leafy throughout; the leaves larger close and imbricate at top, smaller and more distant below; green when young, reddish mature. Leaves sub-oblate-orbicular (in outline), the top almost bifid, and two large shallow lateral sinuses, margins irregularly and distantly lacinio-denticulate; teeth coarse and variable. Stipules sub-quadratae, bilobed, the sinus reaching nearly to the middle and very broad (larger than lobes), extending quite across, the two corners prominently horned and directed outwards; base sub-cordate and sub-amplexicaul; margins irregularly and slightly distantly denticulate. Cells large, clear, and sub-elliptic, their walls double.

Hab. On the ground among other small *Hepaticæ* and *Schizæa australis*, sides of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill*.

Obs. A pretty species, nearly allied to a Tasmanian one—*I. gunnii*, Hook.f.

404 *Isotachis montana* Colenso.

2. *I. montana*,⁴⁰⁵ sp. nov.

Plant small, tufted, reddish-brown, erect, $\frac{3}{4}$ in.–1 in. high, very slender, simple, sometimes forked at base; stem flexuous, with 2–3 innovations, tips nodding, hairy about bases. Leaves alternate, distant (close and imbricated at innovations), orbicular-quadratae (outline), 3-fid; lobes short, triangular, acute, concave, recurved; sinuses broad, margins sub-sinuate, sometimes a few minute blunt teeth at basal portion. Cells small, compact, orbicular, with minute cellules between them, larger and parallelogrammatic at centre and base. Stipule free, between leaves, small, sub-orbicular, bifid, margins more irregular, with a few minute teeth.

Hab. Among other *Hepaticæ* and small mosses, on the ground, slopes of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill*. [69]

3. *I. mitteniana*,⁴⁰⁶ sp. nov.

Plant pale whitish-brown with a slight tinge of green; sub-erect, 2 in.– $2\frac{1}{2}$ in. high, loosely branched; branches long, simple, and sparingly pinnate, 2 lines wide. Leaves opposite, close, sub-imbricate above, broadly triangular or semi-rhomboidal (smaller at bases), slightly decurrent; tips acute, recurved, irregularly ciliate. Perichaetal erect, oblong, ciliate, tips rounded. Stipules large, distant, sub-oblong-quadratae or broadly reniform, sub-margined, patent, convex much recurved, amplexicaul, largely ciliate (sub-cilio-fimbriate); ciliæ broad at base, flexuous,

405 *Stet.*

406 *Chiloscyphus mittenianus* (Colenso) J. J Engel.

cellular; sinuses large, round. Cells small, sub-orbicular, with minute interstitial cellules, much larger oval and oblong at centre and base. Perianth tubular, $2\frac{1}{4}$ lines long, trigonous, edges undulate with double teeth, mouth lacinio-ciliate. Fruit-stalk $1\frac{1}{4}$ in.– $1\frac{1}{2}$ in. long; capsule rather small; valves oblong-lanceolate, margins slightly uneven, tips obtuse.

Hab. Among other *Hepaticæ*, wet forests near Norsewood, County of Waipawa; 1885: W.C.

Genus 18. *Sendtnera*, Endlicher.

1. *S. quadrifida*,⁴⁰⁷ sp. nov.

Plant sub-erect, 2 in.–3 in. high, with 2–3 main stems from base, each bi- sometimes tri-pinnate, light-green; branches alternate, distant, simple and forked, deflexed, the few lower ones with their tips drawn out and sub-flagellate; the tops of the upper ones and of the main stems sub-globose, from their numerous compacted leaves, recurved and nodding; tips reddish. Leaves erect, sub-appressed, imbricate on branches, $\frac{1}{2}$ line long, narrow oblong, sides straight and largely laciniociliate, quadrifid, or bifid with each of the two main lobes deeply divided; lobes acuminate, wavy, spreading, their margins slightly uneven; sinuses sub-acute, large and deep, extending two-fifths of leaf. Stipules similar to leaves, but smaller. Cells distinct, guttulate in longitudinal and parallel lines, small, sub-orbicular and elliptic, larger and more oblong at base. Fruit not seen.

407 *Lepicolea attenuata* (Mitt.) Steph.

Hab. Among mosses and low herbage on the ground, high hills at Lake Waikare, County of Wairoa; 1888: *Mr. H. Hill.*

Obs. This is a peculiar-looking little plant, especially in its dry state, being then sub-rigid, and somewhat resembling the branches of the smaller states of *Lycopodium densum*, Labill., its leaves and stipules presenting a quadrifarious appearance. It is, however, allied to *S. scolopendra*, Nees, and to *S. flagellifera*, Nees, but differing from both in habit and in colour, and in several characters. [70]

Genus 19. *Polyotus*, Gottsche.

1. *P. prehensilis*,⁴⁰⁸ sp. nov.

Plant several inches long, much spreading, sometimes pendulous, emerald-green, branches alternate, very long; irregular, narrow and graceful, 3-pinnate; branchlets numerous, $\frac{1}{4}$ in.– $\frac{1}{2}$ in. long. Leaves on main stem semi-pellucid, deltoid-cordate, amplexicaul, their edges uneven, sub-margined with a regular compact row of small cells, dimidiate, oblique, sharply apiculate; the anterior margin much arched, with 1–2 subulate teeth near base, the base much produced and largely laciniate; laciniæ spreading, ciliate; ciliæ almost forming a little tuft, very long and spreading, flexuous, cellular, their cell-joints double; auricles free, clavate, erect, sometimes two together, with 1–2 small subulate stipellæ: leaves on branches much smaller, oval and broadly ovate, apiculate, and less ciliate. Stipules on main stem large, oblong-quadratae, auricled, deeply quadrifid, their sinuses

408 *Lepidolaena taylori* (Gottsche) Trevisan.

wide and rounded at bases, conniving at tips, largely lacinio-ciliate all round, flexuous; ciliæ at bases long, divergent; auricles 3–5, stout; stipules on branches 4-fid, lobes long, subulate, simple, less ciliate at bases. Cells large, oblong, clear, with small hour-glass cellules laterally placed. Involucre underneath, axillary, and terminal on short lateral branchlets, oblong, erect, rough with long fimbriæ; mouth much laciniate; laciniaæ acuminate, acute; involucral leaves erect, the outer broadly lanceolate, margins cilio-denticulate, apex acuminate, acute; the inner linear, their lateral margins thickened, entire, and distantly denticulate, the apex very acuminate acute, sometimes dilated and sub-truncate, and then cilio-denticulate.

Hab. On horizontal branches of living trees and shrubs, forming large irregular patches, overrunning itself largely, and frequently hanging loosely in the wind; shaded forests near Dannevirke, County of Waipawa; 1888: W.C.

Genus 20. *Radula*, Nees.

1. *R. xanthochroma*,⁴⁰⁹ sp. nov.

Plant minute, somewhat tufted, creeping, main stems 2–3 lines long, 1 line wide (including leaves), flexuous, branched, cellular; cells sub-quadratae. Leaves yellow, oblong-obovate, alternate, distant below, sub-imbricate above, larger and broader on main stems, smaller and narrower on branches, margined; lobules sub-oblong-obovate, dimidiate, scarcely half the length of leaf; involucral leaves similar to those of stem, but smaller.

409 *Radula physoloba* Mont.

Cells orbicular, clear, large for plant. Perianth terminal on short branchlets, campanulate, mouth somewhat lobed; lobes thickened in the middle by a kind of ridge, mucronate. [71]

Hab. On bark of living trees among other *Hepaticæ*, often found creeping over *Metzgeria*: edges of woods near Dannevirke, County of Waipawa; 1888: W.C.

Obs. Its very diminutive size and pure-yellow colour distinguish it well from all other species known to me. It is rather scarce, though from its smallness it may have been often overlooked. A similar small New Zealand species (*R. strangulata*, Hook. and Tayl.) is given in "Syn. Hepat," p. 730: discovered by Hooker in 1840, but apparently omitted by him in "Fl. Nov. Zealand.;" differing, however, from this species in several characters.

2. *R. lycopodioides*,⁴¹⁰ sp. nov.

Plant erect in little tufts, very small, about 2 lines long, $\frac{1}{30}$ in. wide, simple and 2-3-branched; branches and main stem all of nearly same length and size, sub-cylindrical. Leaves brownish, alternate, densely imbricate throughout, sub-rotund; tips produced over (or incised at) apex of lobule; lobule broadly oblong, tumid, rather large for leaf, being nearly half its length. Cells orbicular, small, larger at centre and base.

Hab. On branchlets of living trees among other *Hepaticæ* and mosses; woods near Dannevirke, County of Waipawa; 1888: W.C.

410 *Radula physoloba* Mont.

Obs. A most peculiar-looking little species; differing widely from all others known to me; resembling the tiny narrow spike of a small *Lycopodium*, or a minute catkin of some amentaceous or coniferous plant.

3. *R. albipes*,⁴¹¹ sp. nov.

Plant minute, sub ¼ in. long, creeping, thickly overrunning, branched, stems cellular; light-green. Leaves alternate, broadly oval, close, but not imbricate, margined; lobe obovate two-fifths of length of leaf. Perichaetial erect, sub-apiculate. Cells orbicular, compact, sub-longitudinally ranged in regular lines. Perianth pedicelled, free, campanulate; mouth slightly denticulate. Fruit-stalk exserted, white; capsule orbicular, black-purple; spores oblong and linear-oblong, obtuse, one end generally broader, sometimes slightly curved.

Hab. On branchlets of *Epicarpurus microphyllus*, Raoul; and on branchlets of *Melicytus microphyllus*, Col.; woods, Dannevirke, County of Waipawa; 1888: W.C.

4. *R. epiphylla*,⁴¹² sp. nov.

Plant prostrate, creeping, 2 in.–2½ in. long, bipinnately branched; branches alternate, long; branchlets short. Leaves of two shapes and sizes: (1) on main stems, close but not imbricate, sub-orbicular, anterior margin and apex rounded, the posterior less so and contracted at base; (2) on smaller [72] branches, sub-imbricate and more oval; lobe very small, angular, sub-trapeziform, tip truncate. Cells distinct, guttulate, brownish, somewhat

411 *Austrolejeunea olgae* (R.M.Schust.) R.M.Schust.

412 *Radula flaccida* & G. Lindenb., Gottsche.

obscure. Perianth terminal on short lateral branchlets, between two branchlets that are divergent from base (giving the appearance of a cross); peduncled, with no proper perichaetial leaves, long, oblong-cuneiform, sides straight, increasing in width to mouth, tip truncate, slightly uneven; capsule included, narrow obovate, mucronulate.

Hab. Epiphytical on fronds of *Hymenophyllum* (sps.); damp woods, Dannevirke, County of Waipawa; 1888: W.C.

Genus 22. *Lejeunia*, Libert.

§ 1. Stipules 0.

1. *L. ochracea*,⁴¹³ sp. nov.

Plant small, brownish-yellow, creeping, 1 in. long; main stem flexuous, terete, shining, sub-tripinnate, much branched; branches close, very irregular in size, long and short alternately. Leaves orbicular, tapering at bases, imbricate; lobule rather large, ovate, inflated; tips truncate. Cells minute, compact, orbicular, with minute interstitial cellules. Stipules 0.

Hab. On bark of trees, mixed with and overrunning *Frullania* (sps.), woods, Norsewood, County of Waipawa; 1885: W.C.

413 Not found.

§ 4. Stipules 2-fid.

2. *L. albiflora*,⁴¹⁴ sp. nov.

Stems $\frac{1}{4}$ in.– $\frac{1}{2}$ in. long, creeping and ascending, much branched, often forming a small densely-implexed mass. Leaves pale-green, highly cellular (also stems), pinnate, alternate, distant, sub-sessile, spreading, wavy, slightly obovate, obtuse, margined; tips sometimes dimidiate, the anterior apical margin excised; lobule oblong-obovate, one-fifth of leaf; involucral leaves smaller, entire. Cells orbicular, punctulate. Stipules elliptic, largely bifid, tips obtuse. Peduncles numerous, terminal on short lateral branchlets, long, curved. Perianths erect, whitish, very conspicuous, campanulate, exserted free, smooth, plicate, obscurely angled at top, mucronate, 4-fid shortly cut; lobes oblong, tips obtuse, jagged, sub-mucronulate. Fruit-stalk stoutish, length of perianth; cells large, longitudinal, transversely and equidistantly ringed with 4–5 brown bands. Capsule globular, dark-coloured; lobes sub-acute; elaters adhering; spores rather large, oblong and sub-linear-reniform, thickish, red-brown, opaque.

Hab. On branchlets of *Epicarpurus microphyllus* and [73] *Melicope simplex*, thickets south of Dannevirke, County of Waipawa; 1888: W.C.

Obs. An interesting and rather curious little species, of pleasing appearance from the large number of its minute and erect flowers peering above its green leaves; its perianths also assume a pale, almost white, colour, making them still more conspicuous with their exserted dark-coloured capsules. It is pretty closely allied to *L.*

414 Not found.

rufescens, Lind., and also to a British species—*L. minutissima*, Dumort.

3. *L. epiphylla*,⁴¹⁵ sp. nov.

Plant very small, sub $\frac{1}{4}$ in. high, tufted; main stems creeping; branches sub-erect, simple and forked. Leaves close and imbricate, somewhat falcate, oval, dimidiate; tips obtuse, and sub-acute; anterior base produced, margins slightly uneven; lobule broadly ovate, tumid. Perichaetial leaves obovate; tips sub-apiculate, obtuse. Cells small, clear, various—orbicular to narrow oblong, walls thick with minute cellules, smaller and more regular at margins. Stipule oval, bifid. Perianth sessile, obovate-oblong, plicate, campanulate when expanded, mouth truncate; tips of lobes rounded, apiculate. Fruit-stalk shortly exserted, curved, transversely ringed; capsule sub-orbicular; valves broadly ovate, split half-way down, pellucid, cellular.

Hab. Epiphytical on *Hymenophyllum* (sps.), woods, Dannevirke, County of Waipawa; 1888: W.C.

Genus 23. *Frullania*, Raddi.

§ 2. Lobule vertically elongate, &c.

1. *F. tongariroense*,⁴¹⁶ sp. nov.

Plant prostrate, slender, graceful, $1\frac{1}{2}$ in.—2 in. long, branched, sub-tri-pinnate; branches alternate, distant, 3–4 lines long; branchlets short, 1 line long. Leaves concave, distant, and large on main stems, less so on branches,

415 Not found.

416 Not found.

close on branchlets but not imbricate, sub-oblate-orbicular or broadly elliptic, dimidiate with anterior margin incurved at tip, apiculate; pale-green with a very narrow purple margin (and so scales); lobule large, purplish-brown, erect, a little inclined from stem, elliptic-clavate, broadest at apex, the tip produced beyond margin of leaf. Scale hippocrepiform, with many fine wavy ciliæ proceeding from the centre; sinus large, spreading, extending half through in depth.

Hab. Among other *Hepaticæ* and mosses on the ground, Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. A species allied to *F. minutissima*, Col. ("Trans. N.Z. Inst.", vol. xix., p. 298). The little dark lobule has a curious [74] appearance, somewhat resembling a very short-stemmed, small, and plain tobacco-pipe.

2. *F. intermixta*,⁴¹⁷ sp. nov.

A minute prostrate species; stems stoutish, about $\frac{1}{2}$ in. long and $\frac{1}{40}$ in. wide, branched; branches 1–2 lines long. Leaves brownish, distant below, sub-imbricate at tips of branchlets, oblate-orbicular, sub-cordate at base, margins slightly uneven; lobule large for plant, dark-coloured, inflated, galeate, upright, tip truncate with a bell-mouth rim produced beyond margin of leaf. Stipules shortly bifid, with two acute teeth on each side. Cells sub-quadrilateral, regular, clear.

417 *Stet.*

Hab. On rotten logs among other and larger *Hepaticæ*, particularly *Gottschea*; low wet woods near Dannevirke, County of Waipawa; 1888: W.C.

Obs. A peculiar little species, having affinity with *F. reptans*, Mitt., *F. fugax*, Hook.f. and Tayl., and *F. pentapleura*, Hook.f. and Tayl., in the shape of its leaves and lobule. Only a few specimens were obtained; probably overlooked from its very minute size and low, creeping, hiding habit. Fruiting specimens not seen.

3. *F. platyphylla*,⁴¹⁸ sp. nov.

Plant rather large (?)—only a single branch seen; 1½ in. long, 1 line wide, bipinnate, dark-brown, flat; branchlets distant, spreading at right angles. Leaves bifarious, much imbricate, orbicular, cordate, clasping, slightly overlapping at base, margins minutely uneven, particularly at base; lobule large, flat, depending, semi-circular-ovate, dimidiate; base free, broad, much arched; tip slender, acute, recurved, slightly produced. Stipule broadly reniform or sub-reniform-cordate, the sinus very small, broad, obtuse, margins slightly uneven, with a small oblong laciniate stipella adpressed at base, and a tuft of small spreading fibres below it. Cells small, orbicular, with very minute interstitial cellules.

Hab. Among mosses, &c., woods, Dannevirke, County of Waipawa; 1888: W.C.

Obs. This species strongly resembles *Madotheca stangeri*, Gottsche (itself a variable plant), especially

when living (damp) and merely looking at its dorsal side; hence I suppose it to have been overlooked or passed by.

4. *F. diffusa*,⁴¹⁹ sp. nov.

Plant large, dark-green, 2 in.–3 in. (or more) long, much branched, 3-pinnate, rather rigid, implexed. Leaves on the main stem, distant, reniform, clasping: on the branches, sub-imbricate, broadly ovate, dimidiate, sub-falcate, tips very obtuse and rounded, their cells small, obscure, sub-rhomoidal with black bead-like central points: on the young branchlets, [75] light-green, oval, margined, their cells sub-orbicular and of various sizes. Lobule (occasional) very small, adpressed to stem, galeate with a short beak, not produced beyond leaf. Stipule small, sub-hippocrepiform, margins entire; sinus slightly oblique, margins uneven, base obtuse; tips coarsely produced, one larger than the other; cells small, obscure. Perianth green, ovate, deeply carinate on one side, densely muricated, shining; tip obtuse, mucronate.

Hab. Forming large spreading overlapping patches on living trees, woods, Dannevirke, County of Waipawa; 1888: W.C.

5. *F. cunninghamiana*,⁴²⁰ sp. nov.

Plant large, greenish, prostrate, creeping, much branched especially at tips of main stems, quadripinnate; branches 1½ in.–2 in. long. Leaves large, close, imbricate, clasping, sub-vertical, patent, orbicular-reniform, margined; margins slightly uneven, light-brown. Cells

419 *Frullania pycnantha* (Tayl.). E.A.Hodgs.

420 *Frullania squarrosula* (Tayl.) E.A.Hodgs.

small, guttulate. Lobule small, narrow-galeate, adpressed to stem, not produced beyond leaf, tip small, obtuse. Stipules sub-reniform-orbicular; sinus small, margined. Perichaetial leaves—the inner erect, much laciniate, flexuous, waved; the outer very broad, sub-orbicular, margins crenate-sinuate; their cells large, oblong-quadrilateral below, guttulate and distinct above. Perianth oblong, trigonous, smooth, one side flat, the other largely carinate; the carina wide, blunt, not extending to mouth; tip truncate, apiculate. Capsule exserted, brown; valves broadly ovate, roughish within; tips sub-acute, abounding in elaters; elaters double-spiral, dilated at ends.

Hab. On living *Podocarpus totara* trees, forming large thick patches; woods, Dannevirke, County of Waipawa; 1888: W.C.

6. *F. banksiana*,⁴²¹ sp. nov.

Plant small, sub-rigid, scarcely 1 in. long, bipinnately branched; branches few, with two stipellæ at base of each branch, and one at each leaf. Leaves distant, oval, margins slightly uneven. Lobule close to stem, narrow galeate; tips long, recurved, partly below margin of leaf. Cells small, sub-orbicular, compact, rather obscure. Stipule broadly oblong; tip sub-acuminate; sinus deep, spreading.

Hab. On ultimate branchlets living trees, woods, Dannevirke, County of Waipawa; 1888: W.C.

421 *Frullania pycnantha* (Tayl). E.A.Hodgs.

7. *F. solanderiana*,⁴²² sp. nov.

(One branch only.) $\frac{3}{4}$ in. long, tripinnate; branchlets numerous, alternate, with long sub-lanceolate-ovate stipellæ at bases of branchlets; pale-brownish. Leaves broadly oval, almost rotund, sub-margined, larger on branch than on [76] branchlets, pale-brownish. Lobule darker-brown, free, sub-rotund, inflated, patent from stem and projecting below leaf, with a minute acute beak at centre of posterior margin. Cells small, clear, of various shapes, sub-quadrilateral and irregularly angular, walls thick and double with minute cellules in them. Stipules sub-reniform-orbicular, bifid; sinus linear, rather narrow, 2–4 coarse teeth in margins.

Hab. Among *Hepaticæ* (spns.), woods near Dannevirke, County of Waipawa; 1888: W.C.

8. *F. curvirostris*,⁴²³ sp. nov.

Plant small; stems stoutish, flattish, 1 in. long, nearly 1 line wide, branched; branches alternate, rather long, sub-pellucid. Leaves broadly elliptic, reddish tinged; margins slightly uneven; tips obtuse and sub-acute. Cells clear, orbicular, with very minute interstitial cellules. Lobule large, purplish, galeate, arch much produced, turgid, shining; tip long acuminate, recurved, passing beyond both margin of its own and of the next leaf, slightly sub-imbricate. Stipule large, sub-orbicular, bifid, laciniate.

Hab. Woods near Dannevirke, County of Waipawa; 1888: W.C.

422 *Stet.*

423 *Stet.*

9. *F. polyclada*,⁴²⁴ sp. nov.

Plant forming close matted patches of a few inches each way. Stems 2 in.–3 in. long, much branched, with numerous very short patent lateral branchlets. Leaves sub-oblong-orbicular or broadly transverse oblong, one end broader than the other, olive-green (young ones and branchlets bright-green), obscure, margined; margins purple and minutely scored or marked with straight transverse lines; lobule small, galeate, tip acute, not extending beyond margin of leaf. Cells indistinct, exceedingly minute and irregular, punctulate, larger clear and broadly oblong in centre at junction with stem.

Stipules narrow hippocrepiform, the sinus deep, broad at margin, with the two angles acute. Perianth terminal on short lateral branchlets, green, oblong, tuberculate, keeled sharply on one side, with two smaller carinulae at the base, the other side flattish; tip retuse and mucronate. Capsule enclosed, globular, large. Involucral leaves large, bifid, acute.

Hab. On indurated clayey boulders, Whangawehi, north side of Table Cape; 1887: *Mr. A. Hamilton.*

Obs. A species very near to *F. echinella*, Col., but differing in its peculiar habit of growth with short starry lateral branchlets—its dimidiate margined leaves with widely different cells—its perianth of a different shape, with straight sides, and more coarsely tuberculate—and its bifid involucral leaves. [77]

10. *F. ichthyostoma*,⁴²⁵ sp. nov.

Plant 1½ in.–2 in. long; branches tripinnate, much implexed. Leaves transversely set, sub-vertical, orbicular, margins uneven, tips recurved; brown-black, but when young green. Perichaetal large, broadly ovate, acute, sub-amplexicaul. Cells various shapes and sizes, oblong, sub-rhomboidal, their edges uneven and curiously sub-crenulate. Stipule small, reniform, with a bunch of rootlets at its base; sinus slightly lateral (resembling a fish's mouth in profile), shallow, spreading, the upper or apical angle larger. Perianth oblong, smooth, sub-4-gonous, largely and bluntly carinate on one side, slightly so and only half-way down on the other; tip mucronate.

Hab. On trees, woods, Dannevirke, County of Waipawa, forming large spreading patches; 1888: W.C.

Obs. A species peculiarly marked in the microscopical and regular crenulate divisions of its cells—a curious (if not unique) character; also in the oblique sinus of its stipule—whence its trivial name.

11. *F. pulvinata*,⁴²⁶ sp. nov.

Stems 1 in.–2 in. long, much branched and implexed. Leaves orbicular-cordate, margin slightly uneven. Cells oblong with minute interstitial cellules, also (without epidermis) distinct, beaded. Perichaetal erect, broadly ovate, acuminate, bifid; lobes acute spreading, sinus deep. Stipule broadly orbicular; margin slightly irregular; sinus rather small; cells guttulate. Perianth flattish,

425 *Frullania squarrosula* (Tayl.) E.A.Hodgs.

426 *Frullania squarrosula* (Tayl.) E.A.Hodgs.

oblong, smooth, slightly keeled on one side, mucronate; mucro stout, obtuse.

Hab. On living trees, woods, Dannevirke, County of Waipawa, forming big patches; 1888: W.C.

Genus 27. *Zoopsis*, Hook.f. and Tayl.

1. *Z. basilaris*,⁴²⁷ sp. nov.

Plant terrestrial, minute, sub-erect, and decumbent, glabrous, pale-green, densely gregarious. Root long (for plant), straight, capillary, hyaline, white with minute spreading lateral rootlets; stem very short, branches simple, and once branched, spreading, 3–4 lines long, $\frac{1}{80}$ in. wide, wholly composed of an innumerable number of large transparent orbicular cells, their single narrow walls or divisions (in appearance) intercircling each other, central nerve dark and very stout; the branches linear, 6 cells wide, pretty regularly sub-lobed with alternate gibbous lateral projections, each composed of 2–3 cells with a smaller hemispherical cap, or boss, on the outside one, their tips broader, obtuse. Perianth single, basal, subsessile, erect, obovate, $\frac{1}{10}$ in. long, composed wholly of cells, no nerves; mouth cut into five rather long acuminate and [78] acute lobes, tips conniving. A few spreading bifid and trifid cellular scales at its base, with many single narrow linear hyaline spreading fimbriæ below them.

Hab. On the ground among other *Hepaticæ* and mosses shaded wet woods south of Dannevirke, County of Waipawa; 1888: W.C.

427 *Stet.*

Obs. A species having close affinity with *Z. argentea*, Hook.f., and also with *Z. flagelliforme*, Col. ("Trans. N.Z. Inst.", vol. xviii., p. 250), but differing from the former in habit, in texture, and in colour, in its larger number of lateral cells, and in its not possessing any "ciliiform appendages," or "bristles," or "saw-like teeth" to its marginal bosses; and from the latter in its branches being 6 cells in width, in their not being flagelliferous at tips, in its perianth being basal and much less laciniate, &c. This little plant affords a very pleasing and highly instructive, though tedious, microscopical study.

2. *Z. muscosa*,⁴²⁸ sp. nov.

Plant prostrate, creeping, forming large thick patches several inches square; light-green. Stems 1 in.-1½ in. long, $\frac{1}{30}$ in. wide, dichotomous; branches spreading largely; nerve stout, dark, flexuous; margins sinuous, regular; cells very large, sub-quadrilateral, usually about six in the width of a branch. Long flagellæ, or very narrow sub-rigid branchlets, proceed from main stem and axils at right angles.

Hab. On rotten logs, wet woods near Dannevirke, County of Waipawa; 1888: W.C.

Obs. A species near *Z. flagelliforme*, Col. (*supra*), but differing in habit, in its larger size, broader stems and branches with more regular margins, their cells bigger and of a different shape, and the tips of the branches not flagellate.

Genus 30. Symphyogyna, Mont. and Nees.**1. *S. platystipa*,⁴²⁹ sp. nov.**

Plant small, stipitate, gregarious, roots shortly creeping, 2–3 fronds together on a rhizome; erect, 1 in.–1¼ in. high. Stipe slender, pale, sub-rigid, flexuous, flat at top not winged, sometimes once branched near base. Frond broadly reniform, ½ in.–¾ in. broad, 2-branched; branches short, twice forked; lobes linear, wide, very thin, transparent, bright-green, slightly undulate, margins entire, tips deeply emarginate, nerve scarcely reaching to notch. Cells large orbicular-oblong. Calyptora at base of main forks, three on a plant, sub-peduncled on a small bulbous process, large, broadly reniform, wavy, the ends free not encircling nor adhering; margin entire and slightly sub-sinuate. Within calyptora 12–14 small erect linear pellucid sacs (antheridia), transversely marked in small [79] squares, their margins minutely constricted at nodes, tips reddish.

Hab. In wet hollows, deep woods south of Dannevirke, County of Waipawa; 1888: W.C.

Obs. A species having affinity with *T. flabellata* of Hook., "MUSCI EXOTICI," tab. 13 (but not of La Billardiere, "PLANT. NOV. HOLL.," tab. 254, an Australian species, which I believe to be very distinct).

429 Not found

Genus 31. Metzgeria, Raddi.

1. *M. flavo-virens*,⁴³⁰ sp. nov.

Plant small, gregarious, forming thick sub-erect sub-flabelliform tufts, 3–5 lines diameter; branches irregular, $\frac{1}{2}$ line wide, translucent; midrib stout, cellular; margins slightly thickened; yellow-green; crisp when dry. Cells large, hexagonal-orbicular, walls narrow double with minute interstitial cellules. Peduncle usually axillary at forks, sometimes two together, $\frac{1}{2}$ line long, stout, bristly. Involucre small, ovate, acuminate, adpressed. Calyptra oblong-obovate, dark-green, bristly; bristles close, patent, white, pellucid, tips obtuse. Capsule small, globular; cells sub-quadrilateral. Antheridia in alternate scales, ovate, acuminate, laciniate, bristly.

Hab. On trunks of living trees, near their bases, forming dense large spreading patches; dry woods near Dannevirke, County of Waipawa; 1888: W.C.

ORDER VIII.—FUNGI.

Tribe III. HYDNEI.

Genus 13. Hydnum, Linn.

1. *H. novæ-zealandiæ*,⁴³¹ sp. nov.

Large, much and intricately branched from a short thick sub-corky stem; whole mass very compact, surface uneven, roughish, somewhat resembling an advanced

430 *Stet.*

431 *Hericium coralloides* (Scop.) Pers.

cauliflower; branches irregular, flexuous, 2 in.—4 in. long, pithy, soft yet firm and toughish, whitish below and throughout, with a reddish-brown tinge outside at tips; spines sub-secund, numerous, close but very distinct, of irregular lengths $\frac{1}{2}$ in.— $\frac{3}{4}$ in. long, smooth, subulate, acute, sometimes tips bi- and tri-fid.

Hab. On *Nesodaphne tawa*, forests near Dannevirke, County of Waipawa; 1888: W.C.

Obs. Apparently this must form a large plant, as the portion of one brought fresh to me was as big as a small cauliflower, about 4 in. across, and evidently severed from a larger part. I may here observe that the species under *H. clathroides* (?), Pall., ("Handbook Fl. N.Z.", p. 611), was also detected [80] by me in these forests just forty years ago; then only once, and never seen by me since. That one, however, was a very different species—as to habit, size of branches and spines, colour, &c. I obtained it in wet weather (when shut up in my tent in these woods by flooded rivers, and no paths), and therefore could not preserve or dry my specimens as I wished.

**1888 A Description of some newly-discovered
Phænogamic Plants; being a further
Contribution towards the making known the
Botany of New Zealand.
Transactions of the New Zealand Institute 21: 80-
108.**

[Read before the Hawke's Bay Philosophical Institute,
12th November, 1888.]

ORDER XXII.—LEGUMINOSÆ.

Genus 1.⁴³² Carmichælia, Br.

1. C. corymbosa,⁴³³ sp. nov.

Shrub erect, 6 ft.–8 ft. high, much branched, dark-green. Branches terete, long, and slender, sub-erect, spreading and drooping; branchlets sub-semi-terete and flattened, long and flaccid, narrow, 1 line wide (some less), striate on both sides, margins slightly recurved, tips obtuse and sub-acute, generally ending with a scale. Leaves alternate, lateral from notches in edges of branches, with small scarious bracts at the base of the petiole, very few and scattered on lower branchlets (little more plentiful on young plants), membranous, green above, sub-glaucous below, trifoliolate or imparipinnate, $\frac{1}{2}$ in. long, cuneate and cuneate-obcordate, emarginate, the sinus deep with a minute mucro, the terminal leaflet two to three times larger than the lateral pair, which are distant, opposite,

432 WC: The numbers attached to the orders and genera in this paper are those of them in the "Handbook, Flora of New Zealand."

433 *Carmichaelia flagelliformis* var. *corymbosa* Colenso.

and shortly petiolulate, all three jointed; joints pale; veins largely anastomosing, margins entire yet slightly and closely sub-crenulato-denticulate; petioles flat, very slender and narrow, almost filiform, $\frac{1}{2}$ in.– $\frac{3}{4}$ in. long, striate, edges slightly recurved, ciliate at top under limb, with a few scattered weak hairs on petiole and on limb beneath; sometimes there is only the single terminal leaflet, which is then much larger and of the same shape, and sometimes (but more rarely) only the small lateral pair. Flowers scattered, lateral and infra-axillary under younger branches and branchlets, collected in short sub-corymbose heads 8–10 together, 3–4-fascicled, with 3–4 small scarious bracts forming a ring at their base, sometimes [81] (but rarely) in short sub-racemes.

Peduncle and pedicels slightly pubescent; pedicels stout, $\frac{1}{10}$ in. long, bibracteolate at base of calyx, a bracteole at the middle and another at the base (both peduncle and pedicels lengthen in maturing fruit), bracteoles small, triangular, reddish-brown, and scarious, margins laciniate. Calyx glabrous, cup-shaped, acutely toothed, edges slightly ciliate. Corolla pale lilac with darker veins, many-nerved; nerves forked at tips; standard oblate-orbicular, $2\frac{1}{2}$ lines across, with a central darker blotch, largely emarginate, unguiculate; wings broadly oblong, 2 lines long, obtuse, auricled; keel broadly oblong-reniform, 2 lines long, tip rounded very obtuse. Anthers sub-rotund; style papillose at top; stigma capitate. Pods single, or 2, 3, 4, or 7 together, elliptic, dimidiate, 3–4 lines long including short beak, glabrous, pale-green when young, grey at maturity, blackish in age, veined; beak stout, subulate, straight, acute, $\frac{1}{20}$ in. long (longer and stouter in age); replum very stout and irregularly

rugulose close within and around its border, which sometimes extends to its beak; pod internally thinly lined with greyish wool. Seed usually 1, large, $\frac{1}{10}$ in. long, reniform, turgid, shining, dark-yellow mottled with purple streaks; sometimes 2 small seeds, irregular in shape and somewhat obtusely triangular, as if the one reniform seed had been divided transversely into two.

Hab. On the banks of streamlets, woods south of Dannevirke, County of Waipawa; 1887–88, flowering in January: W.C.

Obs. This, as a species, seems very distinct from all the other known ones; probably its nearest ally is *C. flagelliformis*, Col.

ORDER XXVI.—DROSERACEÆ.

Genus 1. *Drosera*, Linn.

1. *D. minutula*,⁴³⁴ sp. nov.

A very small stemless species, of close gregarious habit. Roots long (2 in.–3 in.), straight, vertical, wiry, black, very hairy, 2–3 to a plant. Leaves reddish-brown, rosulate, crowded (8–20) in 2–3 rows, spreading flat on the ground, the whole plant $\frac{1}{3}$ in.– $\frac{1}{2}$ in. (rarely $\frac{3}{4}$ in.) in diameter; leaf with petiole about 3 lines long, the lamina 1 line long, orbicular and sub-orbicular-spathulate, veined, the whole upper surface glandular; margins largely ciliate-fringed, the ciliæ longer than leaf, flat, veined, subulate, wavy, with dark (almost black)

434 *Drosera spatulata* Labill.

knobbed tips, clavate and sub-orbicular and apparently solid, extending round lamina at its base; the glands on centre of leaf sessile, blackish: petioles dark blackish-green, 2 lines long, flat, wide, glabrous, largely winged at bases; wings reddish-brown, membranous, margins entire, acute, and finely [82] lacerate at tips, with a single acute central lobe adnate on the upper side. Flowers solitary, sometimes two together at top of scape, peduncled. Scape erect, $\frac{1}{3}$ in. high, 1–3 on a plant, one central, others lateral among leaves, with a small subulate bracteole near the top, and at the base of the peduncle of the second flower when 2-flowered. Calyx campanulate, 1 line long, finely papillose and blackish (also scape), lobes 5, cut half-way to base, veined, oblong, very obtuse or sub-truncate, each lobe 5-toothed at tip, sinus broad. Corolla (imperfect) apparently smaller than calyx, and whitish.

Hab. On sides near the top of Mount Tongariro, County of East Taupo, hidden among low herbage and mosses; 1887: *Mr. H. Hill.*

Obs. I. This peculiar little novelty has some affinity with the small New Zealand species *D. pygmaea*, DC. (also found in Australia and Tasmania), but differs from it largely in several characters—as, in its 5-lobed calyx with the lobes obtuse and toothed, its 2-flowered scape, its want of the conspicuously large tuft of silvery stipules at the base of the scape (so very striking a character in that species) and in its still smaller size. It is also allied to *D. uniflora*, Willd., another small rosulate species of Fuegia and the Falklands; from which it also differs in

the shape of its calyx-lobes, and in being 2-flowered, and in some other characters.

II. Unfortunately, perfect flowering specimens I have not seen. Indeed, these specimens that I have were only preserved after a great deal of pains and patient labour, for they came to me in little, mouldy, dry, and hard turfs (1 in.–2 in. long), as cut up out of the black boggy soil in which they grew, and not a single leaf of *Drosera* was distinguishable, and scarcely anything else, those turfs having been also roughly packed, wet, on the spot, and so dried and squeezed in carrying and long-keeping; hence the delicate and small corollas of the *Drosera* (and other plants) were all more or less imperfect. It was only after soaking the turfs in water, and patiently washing and going over them with a stout needle and a camel-hair pencil, that I managed to clean and obtain my specimens. From those turfs, however, I secured more than a dozen plants of the *Drosera*, but not all bearing flowering scapes. Those little lumps also contained several other minute plants, one of them proving to be a *Muhlenbeckia*, sp. nov.,⁴³⁵ and the following, which I have also determined: viz., *Claytonia*, sp., *Stackhousia* (?) *minima*, *Haloragis*, sp. (probably *H. minima*, Col.⁴³⁶), *Hypoxis*, *Carex*, sp., some barren mosses, a few very minute *Hepaticæ*, *Cladonia*, (?) sp. nov., with small black [83] clustered apothecia: all very thickly and almost inextricably growing together, firmly bound down by the very small and twiggy hypogæous *Muhlenbeckia*; and all

435 WC: See p. 98, *infra*.

436 WC: "Trans. N.Z. Inst.," vol. xviii., p. 259.

more or less cut into small bits and broken, with their tender parts decayed.

ORDER XXXIII.—UMBELLIFERÆ.

Genus 1. Hydrocotyle, Linn.

1. *H. amæna*,⁴³⁷ sp. nov.

Plant small, creeping, bright-green, glabrous. Stems hypogæous, 1 in.—3 in. long, stoutish, flexuous, much branched, rooting at nodes; branches short. Leaves small, scattered singly and in pairs, sometimes three together, orbicular, sub-peltate, 2–4 lines diameter, sinus narrow, 5-ribbed, 5- (rarely 7-) lobed; lobes shallow, tri-crenate, sub-acute, anterior ones imbricate at edges, shining alike on both sides; petioles $\frac{3}{4}$ in.—1 $\frac{1}{4}$ in. long, stoutish, with a few weak diverging and retrorse flattish hairs at top under leaf. Stipules small, pellucid, bladdery, margins entire. Peduncles same length as petioles, flexuous, opposite to leaves. Umbels usually 6- (sometimes 5-, very rarely 9-) flowered. Involucral leaves 6, oblong, 1-nerved, adpressed; tips obtuse, coloured. Flowers sessile, pale-pink (as, also, styles, the minute calycine teeth, and the central meeting of ribs of leaf); petals deltoid-ovate, sub-acute, spreading. Stamens much exserted, longer than petals; anthers orbicular, didymous, bright-yellow. Styles rather long, curved, diverging. Fruit flattened, glabrous, smooth, ribs indistinct, back obtuse.

437 *Inc. sed.*

Hab. Hidden among low thick herbage, grassy plains, Tahoraiti, south of Dannevirke, County of Waipawa; 1887: W.C.

Obs. This little species has affinity with *H. intermixta*, Col. ("Trans. N.Z. Inst," vol. xvii., p. 240), but differs from it in several particulars (*vide descr.*).

2. *H. sibthorpioides*,⁴³⁸ sp. nov.

Plant procumbent, creeping, straggling, slender; main stems 1 ft.-2 ft. (or more) long, much branched; branches 6 in.-9 in. long, red, hairy, rooting at nodes, each node emitting three thick hairy roots. Leaves pale-green, numerous, distant, sub 1 in. apart, usually 1 at a node, rarely 2 (and when 3, near tips of branches, then with two umbels of flowers), small, 4 lines diameter (sometimes 3 or 2½, rarely 5), thickish, glabrous, but with long weak coarse succulent hairs thinly scattered on veins upper surface, the lower surface generally free from hairs and very glossy; sub-orbicular-cordate; sinus broad, 7-veined, 6-lobed; lobes cut one-third through, their tips broad, 5-6 lacinio-serrate sub-acute, margins brown; hairs [84] cellular, patent, white, acuminate, acute, their bases thickened, semi-bulbous. Petioles ½ in.-¾ in. long, thickly hairy; hairs patent, reflexed. Stipules in pairs, large, obtusely deltoid, finely cut-laciniate, filmy, pellucid, shining, silvery. Flowers opposite to leaf in small globular heads, on short peduncles 1-2 lines long. Umbels 10-20-flowered; flowers small, sessile (but usually 2-3 (at top?) on very short pedicels), crowded, each with a minute oblong-obovate greenish-white 2-

438 Possibly *Hydrocotyle moschata* Forst.f.

nerved bracteole at its base, the nerves very distinct and dark-coloured; petals valvate, broadly ovate sub-acute, pale dashed with red streaks on the outside, minutely pink-dotted within (brown and recurved in age); teeth of epigynous disc dark-red; anthers yellow, oblate-orbicular; styles large, thickish, erect, knobbed, divergent, longer than anthers, persistent. Fruit small, $\frac{1}{18}$ in. diameter, slightly oblate-orbicular, broadest at base, flattish, glabrous; at first pale-green without ribs and the dorsal edge very obtuse, but when quite ripe and dry brown, with a fine raised narrow ridge on each mericarp and on dorsal edge; mericarps closely conjoined without any apparent hollow between.

Hab. Shaded woods near Dannevirke, County of Waipawa; 1887: W.C.

Obs. This species has near affinity with *H. hirta*, Br., and *H. tasmanica*, Hook.f.; also *H. colorata*, Col. ("Trans. N.Z. Inst.," vol. xviii., p. 260), but is distinct from them all in several important characters. It has been specifically named *sibthorpioides* from its general likeness to *Sibthorpia europaea*, Linn., = Cornish moneywort. It is the plant on which *Orobanche hydrocotylei*, Col., is a parasite. (See paper on that curious plant.)⁴³⁹

ORDER XXXVIII.—RUBIACEÆ.

439 WC: See above, Art. III., p. 41.

Genus 1. *Coprosma*, Forst.

1. *C. pendula*,⁴⁴⁰ sp. nov.

Shrub slender, erect, 6 ft.–10 ft. high, much branched above, trunk bare below; bark thin, smooth, bright reddish-brown, somewhat papery and peeling on trunk; branches very long, implexed and pendulous; branchlets slender, divaricate at right angles, tips of the youngest puberulous. Leaves small, few, opposite, distant 1 in.–2 in. apart, usually a pair at tips of short lateral branchlets and of branches, orbicular, sometimes broadly elliptic and very obtuse, 3–5 (rarely 6–8) lines long, entire, narrowly margined; margins red, slightly recurved, ciliolate—in age as if slightly muricated (*sub lente*); tips broadly rounded; base sub-truncate, abruptly tapering, [85] sub-membranous-coriaceous, green above, very pale (almost dead-white) below, glabrous, but slightly and finely pubescent at margins; veins obscure and much reticulate on upper surface (compoundly anastomosing, having copious areolæ between them with free veinlets (somewhat like, those of some ferns—ex. *Polypodium billardieri*), seen clearly when held up between the eye and light; petioles pubescent and ciliate, 1½–3 lines long, flattish at junction with lamina, sub-trinerved. Stipules short, broadly-ovate, sub-acute, pubescent, the lower connate. Flowers rather large, opposite, supra-axillary, single, and 2–4-fascicled on short, stout, rigid peduncles; pedicels, calyx, and corolla sub-hyaline-membranaceous, very pubescent, pale-greenish with dark-purple stripes and dashes; calyx rather large, half the length of corolla,

440 *Coprosma crassifolia* Colenso.

cup-shaped, 4-lobed, two long and two short lobes, each pair opposite and adpressed, the long pair linear obtuse, the short pair broadly ovate and sub-acute; corolla 1½–2½ lines long, 4-fid cut nearly to base; lobes linear (or linear-oblong), obtuse, recurved: *male* (flower larger than female)—pedicel short, stout, curved; the corolla coarsely and sub-strigosely pubescent, oblong and pendulous before expanding, lobes much revolute in flowering; stamens large, exserted, pendulous; filaments 3 lines long, finely pubescent, white, their bases flattened; anthers 2 lines long, linear-oblong, stout, greenish-white; tips acute, bases sagittate: *fem.*—styles 2, stout, 4 lines long, obtuse, white, densely pubescent: *herm.*—as *m.* and *fem.* (*supra*) conjoined in one flower, the styles a little longer and narrower, sometimes 5–7 lobes to the corolla: and the three kinds of flowers on one branchlet. Drupe small, globular, 2 lines diameter, white, glabrous, shining, semi-pellucid, flesh juicy and sweet; nuts 2, flattish-hemispherical, convex on one side flat on the other, 1 line diameter, white.

Hab. Dry woods south of Dannevirke, County of Waipawa; flowering October, fruiting April, 1887 and 1888: W.C.

Obs. I. This is a highly curious species, presenting a very peculiar aspect, both when in foliage only as well as when in flower; differing greatly from all the other species of this genus known to me. Its very long, lithe, pendulous, and strictly divaricate branches—their few small, orbicular, and distant leaves, with their two contrast colours—and its large and exposed flowers—

give it a unique appearance; to which may also be added the novelty of its pure-white fruit—rare in this genus.

II. It does not appear to be very common here (where so many other of its congeners abound), and it was some days before I succeeded in finding a single *female* plant—though I subsequently detected 3–4 others. Another shrub was hermaphrodite, or, more strictly speaking, polygamous—the first, I think, [86] I have ever known of this genus, so pre-eminently diœcious.

2. *C. multiflora*,⁴⁴¹ sp. nov.

Tree erect, 15 ft.–18 ft. high, much branched throughout and very leafy; bark grey, soft, wrinkled; branches and branchlets very numerous, opposite, not divaricate, sub-erect, spreading; ultimate branchlets thickly pubescent; hairs brown. Leaves small, plentiful, opposite in single pairs, and 2–3 pairs together at tips of branches and short lateral branchlets, the single and the outer pairs always the largest, very membranaceous and soft, sub-orbicular with apices retuse and cuspidate, and broadly-elliptic much acuminate with tips acute, 3–4 (sometimes 5) lines long, their bases gradually tapering into the petioles, glabrous, green on both sides, a little paler on the lower surface with scattered long whitish sub-strigillose weak hairs (young leaves very hairy below), margined and finely crenulate; veins light-red, reticulate, conspicuous on both surfaces; petioles 2–3 lines long, broad and trinerved at junction with limb, very slender at base, densely hairy on undersurface; hairs adpressed, sub-strigose; stipules ovate-acuminate, very hairy, their tips

441 *Coprosma areolata* Cheeseman.

glabrous, shining. Flowers: *fem.* very numerous, axillary, mostly sub-fascicled in threes, sometimes single, and 2 together; calyx very small, tube shortly 4-cleft, slightly puberulous (having a double appearance from their close connate stipules, that are larger, with longer acute lobes). Corolla small, 1 line long, green, glabrous, campanulate, 4-lobed, cut scarcely half-down; lobes ovate, acute, recurved. Styles 2, slender, 3 lines long, acute, pink, spreading. Drupe small, globose, 1½–2 lines diameter, slightly depressed at apex, dark-purple, glossy; nuts 2, very small, hemispherical, about 1 line wide; one thick, flat on one side and very gibbous, the other much thinner, scale-like. *Male* flowers not seen.

Hab. Low woods south of Dannevirke, County of Waipawa; flowering November, fruiting April, 1887–88: W.C.

Obs. I. This species will naturally rank among the larger ones of this genus. Its striking character when in flower is the prodigious number of its ♀ blossoms, covering the whole surface of the tree from top to bottom, which—from their being coloured and visible from a distance—has a most striking effect. When I first saw it—looking down on it from an open glade in the hill-forest's side—I could not conceive what plant it might possibly be, its whole outside being suffused with a delicate pink hue. It is the only known species of this large and increasing genus bearing such a character. I was much disappointed, however, subsequently, on seeking its fruit (on two occasions—when immature in February, and when ripe), [87] for I only detected a few, scattered singly here and

there on a large leafy branch, many large branches being without any.

II. I sought diligently throughout several days for the *male* plant, but was unsuccessful. Is it likely that the great paucity of its fruit, very unusual in the genus, was owing to the scarcity of male specimens?

3. *C. coffæoides*,⁴⁴² sp. nov.

A small tree, slender, erect, 12 ft.–15 ft. high, perfectly glabrous throughout, bark smooth light-grey; much branched; branchlets erect, scarcely cylindrical, stout, drooping in fruit. Leaves decussate, distant sub-2 in. apart on main branches, coriaceous-membranous (membranous and flaccid when young), oblong inclining to obovate-lanceolate, tips sub-acute, slightly mucronate, recurved, tapering to petiole; margins entire, but slightly and closely serrulate (*sub lente*), generally of two sizes—(1) large, on main branches, $3\frac{1}{2}$ in.– $4\frac{1}{2}$ in. long, 2 in. broad, petioles $\frac{1}{2}$ in., stoutish; (2) smaller, on axillary branchlets; darkish-green above, a little glossy, paler and dull below; primary veins diagonal, prominent below; venules obsoletely reticulate. Stipules large, deltoid-acuminate, $\frac{1}{4}$ in. long; tips thickened, hard, acute, black. Flowers: *male*, peduncles axillary, the middle one $\frac{3}{4}$ in. long; flowers sessile in glomerate heads, 20 and upwards, with several small leaflets interspersed, and narrow oblong bracts at base, their margins minutely ciliolate; calyx a small shallow circular cup, its margin nearly even; corolla pale-green, narrow campanulate, 3 lines long, 4- (sometimes 3-) lobed; lobes one-third length of

442 *Coprosma robusta* Raoul.

corolla, ovate, tips sub-acute, recurved; stamens 4 (but only 3 in 3-lobed corolla), slender, exserted, pendulous, flexuous, thickened at top, 3–4 lines long, minutely pilose; anthers narrow oblong, sub-acute, 2 lines long, deeply grooved, largely sagittate: *fem.*, clustered, decussately arranged on short axillary branchlets or peduncles, 1 in. long, forming dense, crowded, sub-globose heads—20–40 (or more) together; peduncles compressed, with short opposite branchlets or sub-peduncles, each bearing 5–9 sessile flowers, and usually with 1 minute leaf at its base, the main peduncle often continued and produced at top into a leafy branchlet; calyx 0; corolla very small, yellowish-white, $\frac{1}{10}$ in. long, somewhat tubular, broadest at top, 4- (sometimes 3-) lobed; lobes very short, obtuse, slightly recurved, their margins dark pink-red, stigmas 2 (rarely 3), short, sub 3-lines long, erect, white, stoutish, obtuse. Drupe glossy, 3– $\frac{3}{2}$ lines long, broadly ovoid, sub-compressed, sides furrowed, tip obtuse, sub-truncate; when quite ripe oblong-ovoid, turgid, juicy, vermillion. Seeds narrow ovoid-acuminate, 3 lines long, slightly curved, somewhat rugulose, dull dirty-white. [88]

Hab. Edges of woods and margins of streamlets south of Dannevirke, County of Waipawa, 1888: *W.C.*

Obs. Flowering in October and fruiting in May. Specimens of the *male* plant have been seen carrying *female* flowers at top of branchlet. As a species this will naturally rank with *C. lucida*, Forst., *C. grandifolia*, Hook.f., and *C. autumnalis*, Col. ("Trans. N.Z. Inst.", vol. xix., p. 263), but is very distinct from them all.

Genus 4. Asperula, Linn.

1. *A. aristifera*,⁴⁴³ sp. nov.

A small, slender, weak, ascending perennial herb; main stems 2 in.–3 in. long, hypogæous, sub-rigid, wiry, reddish, branched; branches 1 in.–2 in. high, erect, simple and slightly branched, glabrous. Leaves thickish, glabrous, light-green (as also calyx-tube and branches), 4 in a whorl, $\frac{1}{12}$ in. long, sessile, linear-ovate; margins sparsely ciliate; ciliae usually 4, distant, confined to middle of leaf, stout, white, patent; tips acuminate, bi-, tri-, (sometimes quadri-) aristate, divergent. Flowers terminal in pairs and single in upper axils, peduncled; peduncles longer than leaves, sub-succulent and pellucid, regularly and closely reticulately veined. Calyx-tube glabrous, laterally compressed. Corolla sub-campanulate-rotate, white (sometimes cream-coloured), $1\frac{1}{2}$ lines diameter, 4- (sometimes 5-, rarely 6-) partite, cut nearly to base; lobes linear-ovate, apiculate, sub-papillose, 1-nerved, spreading, recurved; stamens rather long (sometimes 5); anthers bright-yellow. Styles united below, tips free, rather long, spreading; stigmas globose.

Hab. Open grassy plains, Tahoraiti, south of Dannevirke, County of Waipawa; 1887, flowering in November: W.C.

Obs. A highly curious little species, apparently near to *A. perpusilla*, Hook.f., but differing largely in several particulars. Having seen some hundreds of living plants, I find their characters (*supra*) constant. Its little white star-like flowers make it to be conspicuous among the low grass and other small herbage. It seems (to me) to be

443 *Galium perpusillum* (Hook.f.) Allan.

nearly as much allied to *Galium* as to *Asperula*; and under *Galium* I should prefer to place it but for its close natural ally, *Asperula perpusilla*.

ORDER XXXIX.—COMPOSITÆ.

Genus 3. *Celmisia*, Cass.

1. *C. setacea*,⁴⁴⁴ sp. nov.

A small slender species, slightly cottony; apparently growing singly. Leaves few (6–8), 2 in.–3 in. long, $\frac{1}{2}$ line wide, sub-setaceous, greenish-grey, flaccid, drooping, margins revolute, tips acute; their bases dilated and sub-sheathing, [89] glabrous and reddish on the outside, very loosely cottony within, mid-rib on under surface glabrous (and also the whole upper surface in age). Scape single, very slender, 7 in.–8 in. long bracts setaceous, 3–4 lines long, very acute, rather distant (6–7 on scape), and closely appressed. Head small, loose, spreading, $\frac{1}{2}$ in.– $\frac{3}{4}$ in. diameter. Involucral scales few, somewhat disposed in 3 rows (of same length as disc-florets and pappus), 5 lines long, the outer ones the shortest, linear-acuminate with 1 dark central vein, slightly cottony on the outside, tips very acute, margins finely serrulate and ciliate with weak shaggy hairs. Ray-florets 14, distant, sub-lanceolate, $5\frac{1}{2}$ lines long, 4-veined, extending far beyond stigmata; tips obtuse, 1-notched; tube 2 lines long, about one-third length of floret. Disc-florets few, 8–10; stigmas long, subulate, curved, very tuberculate; tubercles linear, obtuse. Pappus pale-reddish, short, nearly equal in length,

444 Possibly *Celmisia gracilenta* Hook.f.

about as long as tube of ray-florets, scabrid; tips acute and bifid. Achene linear, 1½ lines long, angled somewhat 4-sided, glabrous.

Hab. On open ground, high slopes of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

Obs. This slender species is more nearly allied to *C. longifolia*, Cass. (a common New Zealand, Australian, and Tasmanian plant), but differs from that species in many particulars—as, in its single habit of growth, its shorter filiform leaves, more slender scapes with shorter setaceous caudine bracts, much smaller head and fewer ray-florets, shorter and glabrous achenes with pappus-bristles nearly equal. Bentham says of *C. longifolia*: “Ray-florets above 30; achenes fully 3 lines long, more or less silky-pubescent. Pappus-bristles very unequal, the shortest half as long as the longest.” (“Fl. Australiensis,” vol. iii., p. 489.) I quote from Bentham (who also notices our New Zealand plant from Hooker f.) as being the latest work, with a fuller specific description.

Genus 17. *Senecio*, Linn.

1. *S. pumiceus*,⁴⁴⁵ sp. nov.

Plant a sub-erect glabrous perennial herb, 2 ft.—3 ft. high; stems striate, stout below, ½ in. diameter, much branched above, slender and sub-flexuous; flowering stems 8 in.—10 in. long; striæ broad, flattish, yellow-brown. Leaves light-green, purple on under surface, sessile, half-clasping: *the lower ones on main stems* close, oblong, 4¼ in. long, 1½ in.—2 in. broad, sub-membranaceo-

445 *Senecio banksii* Hook.f.

coriaceous, somewhat wrinkled, veins anastomosing, prominent below also the mid-rib; margins grossly serrate and slightly revolute; tip acute; base cordate: *the upper leaves on flowering stems* linear-oblong (sometimes lanceolate), 2 in.–3 in. long, $\frac{1}{2}$ in.–1 in. wide, sparingly toothed [90] (teeth very small) and entire, sometimes but rarely sharply serrate, their bases produced much beyond the stem on the opposite side, membranaceous, decreasing in size upwards, distant; veins largely anastomosing. Flower-heads not large, 3–4 lines diameter, disposed in spreading loose corymbose panicles; peduncles 2 in.–4 in. long, much and dichotomously branched above; pedicels $\frac{1}{2}$ in.–1 in. long, very slender, with scattered small bracteoles throughout. Involucre small, campanulate, 1½ lines long (4 lines diameter when spread out flat), glabrous, glistening, slightly rugulose and scabrid at base; lobes 13, oblong-ovate, about 1 line wide, suddenly sub-acuminate, their centres thick, 2–3 dark-green stripes, 1–2-nerved, nerves yellow; margins membranous, pellucid, very broad, much imbricated, finely and regularly lacerate; tips pilose (semi-tufted), hairs white; several (5–8) small subulate spreading bracteoles with pilose tips close to base. Flowers bright orange-yellow, glabrous, all florets much dilated at bases of tubes. Receptacle white, flattish, alveolate, the alveoles large, sub-quadrilateral, with high-toothed borders, and punctulate in centre, edges of punctures raised. Ray-florets 10, ligulate, 3½ lines long, much recurved; ligule oval, largely veined; veins about 8, the main ones forked at apex; tip retuse, with two small notches, extending far beyond stigmata; the tube short, one-third length of floret, its style glabrous, recurved, tips

not dilated, and when spread out not so wide as ligule. Disc-florets very numerous, 40 and upwards, tubular, 2½ lines long (about two-thirds length of ligulate florets), narrow campanulate or sub-infundibuliform at mouth; anthers included; lobes veined; tips erect, sub-acute. Pappus erect, 2 lines long, fine, white, scabrid; tips acute. Achene linear, $\frac{1}{10}$ in. long, sub-4-sided, deeply sulcated on two opposite sides, pale-brown, glabrous, but minutely hairy in lines on the angles; hairs short, white, distant.

Hab. "Face of pumice rocky boulders near the sea, Whangawehi" (cliffs, north side of Table Cape, East Coast); January, 1888: *Mr. A. Hamilton.*

Obs. I. This plant is certainly allied to *S. banksii*, Hook.f.,⁴⁴⁶ also to *S. velleioides*, A. Cunn. (an Australian species); but, after much examination and study, I believe it to be specifically distinct from both. Having received plenty of good specimens from its discoverer, Mr. Hamilton, and being very desirous of clearly ascertaining the true position of this fine plant, I have very closely and exhaustively examined it, as will, I presume, be allowed from the description given [91] above. It differs from *S. banksii (vera)* in several characters: that plant has "linear-oblong leaves, slender blunt involucral scales, very short ligulæ" (ray-florets), and "long achenia." ("Flora N.Z.," vol. i., p. 147.) It also differs from the allied Australian species, *S. velleioides*, in the much

446 WC: "S. *odoratus*, Hornemann," of "Handbook N.Z. Flora;" but subsequently corrected by Hooker himself, in his "Additions, Corrections, &c., at p. 734, l.c., and the name of *S. banksii* restored.

shorter bracts and shorter disc-florets (and probably very much broader ray-florets) of this plant. Bentham, in his description of *S. velleioides*, says, "Involucral bracts 3–4 lines long, with a very few small outer ones; disc-florets scarcely exceeding involucre." ("Flora Austral.," vol. iii., p. 668.)

II. Hooker, under *S. banksii* (*l.c.*), has also given, with a doubt, two New Zealand varieties of that species: one of them, "var. β *velleia*," may prove to be identical with this plant. Unfortunately, Hooker says but very little about its differential characters, but that little is more in agreement with this plant. I quote his remarks: "Var. β (?) *velleia*; robustior, foliis rigide coriaceis subtus glaucis venis prominulis, capitulis latioribus, acheniis brevioribus." And, again: "The vars. β and γ may belong to different species, but my specimens of them are very indifferent. Var. β is a very thickly leathery-leaved plant, with stout stem and branches of the corymb, which bears very numerous broader heads, that have much shorter achenia."

I may further observe that Hooker also gives the *hab.* and discoverers of *S. banksii* and its two varieties thus: "*Hab.* North Island, East Coast; *Banks and Solander, Colenso.*" And the facts pertaining to the same, taken in connection with the discovery of this plant by Mr. Hamilton on the north side of Table Cape, seem to point to something more than a casual coincidence: for Banks and Solander were only on shore on the east coast at Poverty Bay and Tolaga Bay, a few miles north of Table Cape; and my specimens were also detected by me in nearly that same locality—viz., between Tolaga and Poverty Bays—in

travelling along the east coast early in December, 1841. I have never visited Table Cape.

[Since writing the above I have referred to some brief notes of that journey, written by me at the time to Sir W.J. Hooker (to accompany my specimens), and shortly after published by him in the "London Journal of Botany," vol. iii., p. 16: from them I make the following extract:—

"Dec. 9th, 1841.—I was fortunate enough to obtain here on the clayey cliffs three species of *Compositæ* quite new to me. One (No. 25) grew commonly about the bases and faces of the low clayey and sandy cliffs, and often attained the height of 4 ft.—5 ft. Another (No. 46) was found in similar situations, and of the same height as the preceding: the peculiar glaucous leaves of this last, so much resembling those found on the flowering [92] stems of many varieties of *Brassica oleracea*, greatly attracted my notice."

This locality was on the immediate sea-coast between Pakarae and Poverty Bay, and near to Whangawehi, Table Cape; and I have scarcely any doubt of the said specimen (No. 46) being identical with the plant here described. The season, too, accounts for my specimens (and still more so for those of Banks and Solander, who were a month earlier on the coast) being imperfect—*i.e.*, not fully developed.]

ORDER XLII.—ERICEÆ.

Genus 2. Pernettya, Gaud.

1. *P. macrostigma*,⁴⁴⁷ sp. nov.

A small prostrate shrubby plant. Stems woody, much branched; branchlets short, 1 in.–2 in. long, irregular, glabrous, with a few scattered long weak flexuous hairs, the very young branchlets and leaves finely pilose.

Leaves scattered, linear-lanceolate, 3 lines long, $\frac{1}{2}$ line wide, green, glabrous, patent; tips obtuse, coloured; margins distantly and regularly serrulate, usually 3–4 teeth; teeth white, sub-pellucid, each with a dark hair-like point; petioles short. Flowers small, single, axillary, peduncled; peduncle short, curved, glabrous, with 3–4 broadly ovate bracts at base. Calyx-lobes cut nearly to base, ovate, sub-acute, purple and green, finely pilose within; margins ciliate. Corolla $\frac{1}{10}$ in. long, globose-campanulate, white, veined; lobes short, blunt, tips much recurved. Stamens ovate-acuminate, 1-veined, muricated throughout; tips plain, obtuse, slightly recurved. Style longer than corolla, erect, stoutish, glabrous; stigma large, jagged, spreading; ovary prominently 5-lobed, pilose. Fruit globular, 2 lines diameter, pink.

Hab. Open grounds on dry hills in the interior, Glenross Station, County of Hawke's Bay; December, 1887: *Mr. D. P. Balfour.*

Obs. A species near to *P. tasmanica*, Hook.f., which it also resembles in general appearance. Unfortunately I have had but two small specimens, containing only a few

flowers, to examine. One very peculiar character it possesses is that of the calyx, pilose within.

Genus 8. Dracophyllum, Lab.

1. *D. recurvatum*,⁴⁴⁸ sp. nov.

An erect and tall shrub, or small slender tree, “25 ft.—30 ft. high,” branched at top; trunk below bare, 3 in.—4 in. diameter; bark smooth, greyish. Branches sub-erect and compound; branchlets bare, cylindrical, 4 lines diameter; bark smooth, pale red-brown, pretty regularly annulate with rings of fallen [93] leaves, the rings 1—2 lines apart. Leaves terminal in bunches at tips of branchlets, sub 20, close, imbricate, amplexicaul, linear acuminate, 16 in. long, $\frac{3}{4}$ in. wide at base, sub-coriaceous, smooth, glossy, finely striate, light-green, their upper half exceedingly narrow, tips subulate acuminate, flexuous; their bases orange-coloured, thin, dilated; margins entire (to the eye), but under a powerful lens minutely and distantly bluntly denticulate. Flowers terminal, numerous, crowded, paniculate in a narrow thyrsoid panicle, 5 in. long, $1\frac{1}{4}$ in. wide, linear-lanceolate, erect, red, sometimes 2 panicles together; peduncle very stout, 2 in. long, ringed, puberulous; panicle and pedicels pubescent; sub-panicles $1\frac{1}{4}$ in. long, mostly 4-branched; branches 6—8 lines long, each bearing 9—14 flowers; pedicels short, 1 line long. Sepals sub-oblate-orbicular, veined longitudinally; tips broad, angular; much and finely lacinate; laciniæ acute. Corolla sub-campanulate, 2 lines diameter; tube short, lobes longer than tube, oblong-ovate, wavy, recurved, appressed, 1-nerved; tips obtuse

448 *Dracophyllum latifolium* A.Cunn.

and slightly denticulate. Stamens long, exserted, largely decurved. Anthers large, oblong-ovate, cordate; tips very obtuse, versatile and pendulous appressed around corolla. Style stout, exserted; stigma sub-clavate, capitate, puberulous. Hypogenous scales broadly oblong; tips sub-truncate, denticulate. Capsule (mature and old) very small, orbicular, about 1 line diameter, depressed, reddish.

Hab. On high grounds, "from 2,000 ft. to 3,000 ft. alt.," hills around Lake Waikare, County of Wairoa; 1888: *Mr. H. Hill*. Also, seen there earlier by Mr. A. Hamilton.

Obs. This is a very fine species of *Dracophyllum*, the largest known of our New Zealand species. I had casually heard of it some time ago, but only from settlers, who called it "neinei," the Maori name of the large northern species *D. latifolium*; and therefore, as well as from their very imperfect account of the plant, I had supposed it to be identical with that species: but it is widely different in almost every principal character; its largely-recurved corolla-lobes and anthers, being peculiar and abnormal, give it a singular appearance. It seems, however, to be of various stature: Mr. Hill (who kindly brought me the specimens I have described, gathered by himself) saw it growing singly and sparingly in open and lower grounds, where it was only "from 6 ft. to 10 ft. high," and the diameter of its bare trunk "about 3 in.," its branches assuming a sub-pyramidal form, the largest and lowest being "about 6 ft. from the ground." Mr. Hamilton, however, had seen the plant at a much higher altitude on the same range, forming "extensive thickets or groves,"

and “from 25 ft. to 30 ft. high,” with their bare trunks below “4 in. diameter.” [94]

ORDER XLIII.—MYRSINEÆ.

Genus 1. Myrsine, Linn.

1. *M. pendula*,⁴⁴⁹ sp. nov.

A small slender tree, erect, 10 ft. high, trunk below for 4 ft.–5 ft. bare; branches many, long, pendulous; young branchlets finely and thickly pubescent, straight or slightly curved; bark reddish-brown. Leaves numerous, alternate, close and scattered, single and in pairs, orbicular and oblate-orbicular, retuse (sometimes sub-emarginate and sometimes rounded), usually 3–4 (rarely 5–6) lines diameter, not tapering to petiole, patent, green above pale below, sub-membranaceous, dotted with a few scattered dark-orange globular raised dots, and with several smaller and linear-oblong ones; veined, veins spreading, sub-flabelliform; veinlets finely reticulated; margin slightly uneven, thickened, closely lined with dark-orange raised globular dots (making the edge to appear as if it were coloured red); ciliated, ciliæ flattish, short, ragged, irregular, weak; petiole very short, pubescent, with small thickish dark-coloured stipellæ at base. Flowers axillary, scattered, single, sometimes in pairs (rarely 3 together), very minute, 1 line diameter; peduncle very short. Calyx pale-greenish, glabrous, 4-lobed, not cut to base; lobes broadly ovate, obtuse, ciliolate. Corolla, petals 4, brown, oblong, obtuse,

449 *Myrsine divaricata* A. Cunn.

recurved from middle and appressed, 1-nerved, much reticulated, with a few (4) minute scattered glandular dark-orange dots; margins ciliate and fimbriate; fimbriæ crisp, crinkled. Anthers 4, dark-brown, deltoid-ovate, sub-cordate, appressed, tips minutely crested, crinkled; filaments very short beneath ovary half the length of the anther. Stigma sessile, large, depressed, irregular, spreading. Ovary ovoid-orbicular. Fruit large, globular, $2\frac{1}{2}$ lines diameter, purple, glabrous; apex depressed, hollowish.

Hab. Woods near River Mangateraa, south of Dannevirke, County of Waipawa; 1888: W.C. Flowering in October and fruiting in May.

Obs. A species very near to *M. divaricata*, A. Cunn.; but differing from it in its larger size and habit, in form position &c. of its leaves, in its fimbriated petals and its peculiar crested anthers, and in its larger depressed and purple fruit. When closely examined and compared with the very full and able description and drawing with numerous dissections of *M. (Suttonia) divaricata* given by Hooker f. in his "Flora Antarctica," vol. i., p. 51, tab. 54, this species will be found to differ considerably in many particulars. In drying the specimens their leaves fall off in large numbers; they also become sub-rugulose and shrivelled on the lower surface. [95]

ORDER LI.—CONVOLVULACEÆ.

Genus 1. *Convolvulus*, Linn.

1. *C. (Calystegia) truncatella*,⁴⁵⁰ sp. nov.

Perennial, very large, diffuse, spreading, largely branched, twining and climbing over bushes and shrubs (almost smothering them), and up trees 8 ft.–10 ft. or more. Leaves membranaceous, distant, undulate, sub-orbicular-cordate, 1½.–1½ in. diameter, dark-green, 5-(7–9-) nerved; nerves (and veins) reddish, sub-translucent; basal lobes large, wide, rounded; sinus very broad and deep and truncate at base (2 lines wide at top of petiole); tips obtuse and retuse, with a small abrupt mucro; margins sub-sinuate, much slightly angularly-toothed; largely veined, veins anastomosing; petioles 1 in.–2 in. long, semi-terete, channelled above, spotted light-purple and green, minutely pilose. Flowers scattered, solitary, axillary; peduncles 4 in.–5 in. long, 4-angled, spotted like petioles, glabrous; bracts large, generally 3, sometimes alternate, orbicular-cordate, tip retuse, mucronulate, largely veined, veins anastomosing, margin red, sinuate and sub-angulate; the outer pair 4–5 lines diameter, longer than calyx and distant from it, the inner one close to calyx. Calyx-lobes 4–5, broadly elliptic, mucronate, closely longitudinally veined. Corolla pure-white, broadly campanulate, spreading, 1¼ in. long, 1¾ in. diameter, much veined longitudinally; lobes broad and angular, tips obtuse, margins slightly and irregularly sub-denticulate. Stamens slender, very sparingly muriculate at base. Anthers large, oblong-ovate, tip very

450 Probably *Convolvulus tuguriorum* (Forst.f.) R.Br.

obtuse, base auriculate. Style exserted much longer than anthers. Stigmas large, broadly oblong-clavate or sub-reniform, dimidiate, gibbous, pedicelled, diverging. Capsule large, glabrous, glossy, dark olive-green, sub-quadrately-rotund, 5 lines long, 4–5 lines diameter, turgid with 4 longitudinal depressions, tip sub-acute with a stout straight beak 1 line long. Seeds 4, large, dark orange-red, smooth, $\frac{1}{6}$ in. long, sub-reniform-ovoid, 3-sided, flattened and sub-rugulose on two sides, very turgid on the third; testa very hard.

Hab. Banks of streamlets and edges of woods, Seventy-mile Bush, south of Dannevirke, County of Waipawa; 1887–88: W.C.

Obs. I. This plant is nearly allied to *C. tuguriorum*, Forst., but differs from that species in several characters, the more striking being its much larger size and spreading climbing habit, its differently-shaped leaves with their remarkable truncated bases and broad basal lobes, its double row of large calycine bracts, round-topped sepals, obtuse anthers, large globular capsule, and big red seeds. The leaves on its young [96] and ultimate branchlets are much smaller and closer; perhaps in age they increase in size and distance. I have a specimen bearing 2 flowers on 1 peduncle.

II. This species flowers profusely in February, when it presents a very pleasing appearance from the pure-white of its large, exposed, and numerous flowers. It has potent and active enemies among some of the smaller-winged insects, which eat away the thick stigmas, and lay their egg at a very early date within the immature ovary, piercing it with a minute hole for that purpose, which,

however, does not affect the growth of the capsule or its seeds. In due time a small larva issues from the egg, that devours the seeds. This caterpillar invariably attacks the seeds in the one soft part at their base (*hilum*), the testa being very hard, and is sometimes to be found snugly ensconced within the seed; the seeds when “cleaned out” still retaining their position, size, and colour. I have never found more than one hole in a capsule, and only one larva inside. Such is the havoc occasioned by this minute insect, that it is a very difficult matter to find a whole capsule containing perfect seeds. I have gathered scores (perhaps hundreds) of good-looking capsules, both ripe and unripe—such, too, as were fine and healthy-looking on the plants—but only, in nineteen cases out of twenty, to find them useless—without a sound seed; tenanted if new, or the insect perfected and fled. It must be a very tiny creature, as it emerges by the original small hole without destroying the capsule.

III. A judicious remark of Forster’s on this genus may be mentioned here: “The species of *Convolvuli* are very copious in the South Sea isles, and so closely connected with each other that it becomes very difficult to determine them.” (“Observations,” p. 181.)

ORDER LIII.—SCROPHULARINEÆ.

Genus 6. *Limosella*, Linn.

1. *L. ciliata*,⁴⁵¹ sp. nov.

Plant small, tufted, creeping by surculi, glabrous, rather pale-green, perennial. Leaves erect, spreading and drooping, sub-terete, succulent, minutely dotted, connate in young plants, 8–10 lines long, linear filiform; tips obtuse, rarely very slightly dilated; half-clasping at bases. Flowers single, axillary at bases of leaves, several on a plant; peduncle short, stout, thickened in a ring at top below junction with calyx. Calyx sub-campanulate, 5-partite, segments sub-acute, each marked with a dark-red longitudinal line at base on calyx-tube. Corolla white (sometimes tinged with blue streaks on the outside), campanulate-rotate, 5- (sometimes 4- and 6-) [97] lobed, 1½ lines diameter, nearly twice as large as calyx; lobes large, oblong, obtuse, hairy within and ciliate on the lower half of margins. Stamens exserted; anthers orbicular, bluish. Style long; stigma large, orbicular, much papillose. Capsule sub-globose.

Hab. On mud-flats, margins of streams, Hawke's Bay, forming large patches; 1846–52: W.C. 1888: *Mr. A. Hamilton.*

Obs. A species pretty near to *L. aquatica*, Linn. (and its varieties), but differing in several particulars: as, in its smaller size; its linear filiform semi-terete leaves, which are truly connate in young plants; its larger flowers, the corolla being twice as large as the calyx, with obtuse hairy and ciliate lobes, long style, and large globular stigma.

451 Probably *Limosella lineata* Glück.

Genus 7. *Veronica*, Linn.

1. *V. parkinsoniana*,⁴⁵² sp. nov.

A tall slender erect shrub, 9 ft.–12 ft. high, with long slightly-drooping branches, that are bare below and sparingly leafy at tops. Leaves rather distant, lanceolate, 4 in.–5 in. long, $\frac{3}{4}$ in. broad, glabrous, smooth, sessile, midrib prominent and keeled below towards base; margins entire; tip obtuse. Flowers axillary, racemed; racemes slender, 6 in.–7 in. long, pubescent—as also pedicels, bracteoles, and calyces; pedicels 2 lines long, slender, curved; bracteole at base long, half the length of pedicel, linear, acuminate, 1-nerved. Calyx small, about 1 line long, lobes not cut to base, narrow ovate-acuminate, 1-nerved, finely ciliate. Corolla white, with pale lilac tinge, $\frac{1}{4}$ in. diameter, sometimes 5-lobed, and then the middle lower lobe is the smallest; tube longer than lobes, 2 lines long. Stamens long, much exserted, longer than corolla, broad, compressed, curved, spreading. Style persistent, slender, very long, more than twice the length of capsule, much curved, pubescent. Capsule twice the length of calyx, broadly ovoid, laterally compressed, glabrous but finely puberulous at tip.

Hab. Edges of thickets, country south of Dannevirke, County of Waipawa; 1888: W.C.

Obs. A fine species, near to *V. salicifolia*, Forst., but differing largely in capsule, calyx, &c.

Genus 9. *Ourisia*.

452 *Hebe stricta* (Banks & Sol. ex Benth.) L. B. Moore.

1. *O. calycina*,⁴⁵³ sp. nov.

Plant erect, stout, glabrous. Leaves broadly ovate, (?) 4 in.—5 in. long, dark-green, largely crenate. Petioles nearly as long as lamina. Scape 11 in. long (not fully extended), stout, angled, deeply sulcated below, with a line of weak [98] hairs on each prominent angle (this hairy line is decurrent from the outer angle of base of each caudine bract, 8 lines in all). Bracts on scape: the two lower pairs diphyllous, opposite, sub-sessile, thickish, much and reticulately veined; the lowest pair narrow oblong, 2 in. long, 7 lines wide, sides straight, deeply crenate, acute, without flowers; the next pair smaller, with 3 flowers: the upper bracts in whorls (6 in number), all quadriphyllous, sessile, oblong-lanceolate, 1 in. long (the uppermost $\frac{3}{4}$ in.), 3-nerved; tip obtuse knobbed; margins serrate, purple, their lower half thickly ciliate; ciliæ flat, wavy; each whorl bearing four flowers; all the whorls nearly equidistant, about $1\frac{1}{2}$ in. apart. Pedicels—the lower 3 in., the upper $1\frac{1}{2}$ in. long, angled, stout and rigid below at bases, slender filiform and drooping at tips, each with a single line of weak hairs. Calyx glabrous, 5 lines long, very rugose and wrinkled at base, 5-partite, lobes oblong, sparsely ciliate at their bases, 3-nerved below, only the central nerve percurrent, much reticulated between the outer veins and margins, the inner interstices clear; margins 2-denticulate, teeth obtuse and, with the tip, knobbed and coloured. Corolla pure-white, 1 in. diameter, largely and dichotomously veined, the two upper lobes much shorter, broader, and rounder at tips; tube short, sub $1\frac{1}{2}$ lines long, half the length of tube,

453 *Ourisia macrocarpa* subsp. *calycina* (Colenso) Arroyo.

stout, broad; throat densely lined with lemon-coloured, jointed, and sub-acute hairs. Anthers large, sub-orbicular-reniform. Fruit sub-orbicular, turgid, sub 2 lines long, scarcely half as long as calyx-lobes which enclose it, with a beak and very long persistent flexuous style.

Hab. Highlands on River Waimakariri, near Bealey, South Island; 1888.

Obs. I have only seen one specimen of this plant, but in a good flowering state and fresh; gathered there by a visitor and sent to Napier; its lower stem was wanting, and basal leaves imperfect.

ORDER LXIII.—POLYGONEÆ.

Genus 2. *Muhlenbeckia*, Meisn.

1. *M. hypogaea*,⁴⁵⁴ sp. nov.

A small prostrate twiggy shrub, extending a few inches (?) each way; much branched; main stems and branches being underneath the soil, and rooting at nodes, 4 in.—5 in. long, flexuous and very slender, $\frac{1}{2}$ line diameter, with only the tips of the smaller ultimate branchlets appearing above, and then also prostrate and closely appressed; bark dark red-brown, epidermis thin sub-bladdery; branchlets numerous, very short and intermixed, the younger ones striate and minutely papillose. Leaves few, scattered, orbicular, $\frac{1}{10}$ in.— $\frac{1}{12}$ in. wide [99] (frequently smaller), thickish, margins entire; mid-rib prominent on under surface, veins obscure, petiolate; petioles stoutish,

454 *Muehlenbeckia axillaris* (Hook.f.) Walp.

half length of leaf, channelled above. Bracts (*ochreæ*) entire, bladdery, pale red-brown, very numerous. Perianth solitary, sessile or sub-sessile, rugulose, a little shorter than fruit, closely adpressed, fleshy (in some specimens), 5-lobed, lobes cut half-way to base, oblong, sub-acute; nut 1½ lines long, rhomboidal, triquetrous, angles obtuse, sides concave, tip acute, black, smooth not shining.

Hab. On the sides and near the summit of Mount Tongariro, county of East Taupo, almost entirely hidden among low small herbs and mosses; 1887: *Mr. H. Hill.*

Obs. A very minute, peculiar, and distinct species, of which, unfortunately, I have only a few specimens, found by me concealed in little turf lumps of dark boggy earth, brought from the mountain by Mr. Hill.⁴⁵⁵ The leaves and fruit had mostly fallen off from their branches through damp and close packing, but the bracts remained, and all were perfect, though I only obtained about half a dozen nuts and perianths, and have not seen any floral organs.

2. *M. paucifolia*,⁴⁵⁶ sp. nov.

A low prostrate rambling shrub, extending 5 ft.–6 ft. Branches stout, bark glabrous, longitudinally wrinkled and channelled, dark red-brown. Leaves few, scattered, light-green, broadly elliptic and sub-rotund, 3–6 lines long, obtuse, sometimes retuse, glabrous, rarely contracted at middle, submembranaceous, veins anastomosing obscure (visible when dried); petioles half

455 WC: See "Observation" under "*Drosera minutula*" (supra), p. 82, for a more particular description of these little turf specimens.

456 *Muehlenbeckia complexa* (A.Cunn) Meisn.

as long as leaves, slender, channelled above, finely and closely tuberculate; stipules ovate, acute. Flowers in terminal racemes at tips of short lateral branchlets; racemes simple, short, about 1½ in. long, finely pilose, each bearing 5–7 (rarely 9) flowers, alternate and rather distant; bracts (*ochreæ*) rather large, open, glabrous, pale reddish-brown, obliquely truncate, acuminate with one long stout sub-aristate nerve; margins entire or finely and shortly ciliate (*sub lente*), each bearing a single flower; pedicels longer than bracts. Perianth (and pedicel) white, lobes cut half-way to base, oblong, obtuse, conniving; stamens longer than lobes; anthers sub-orbicular, didymous, sub-versatile, white. Stigmas small, red, glabrous, acute. Ovary (immature) pink, slightly tuberculate.

Hab. On mounds of indurated pumice, &c., at Whangawehi, north side of Table Cape; December, 1887:
Mr. A. Hamilton. [100]

Obs. This species of *Muhlenbeckia* presents a peculiar appearance, from its stout almost gnarled branches, few pale-green leaves, and numerous short lateral branchlets tipped with flowers, whose pedicels are also white. It is allied to *M. complexa*, Meisn., and to *M. microphylla*, Col., but is widely different from both.

3. *M. trilobata*,⁴⁵⁷ sp. nov.

Plant decumbent, much branched and implexed, rising twining and climbing over low shrubs and herbage. Branches long, striate, densely pubescent; hairs short, patent, red-brown. *Fem.:* leaves alternate, distant,

457 *Muehlenbeckia complexa* (A.Cunn) Meisn.

membranaceous, glabrous, green, 1 in.–2 in. apart, broadly ovate (in outline), $\frac{3}{4}$ in.– $1\frac{1}{4}$ in. long, $\frac{3}{4}$ in.–1 in. wide, wavy, sub-panduriform, deeply trilobed, largely cordate; lobes much rounded, apical lobe large, sub-sagittate; tip suddenly acute and sub-apiculate; sinuses broad; margins red, sub-entire, irregular; midrib prominent on the under surface, pubescent on the upper; veined; veins very closely and compoundly reticulate, having copious areolæ between them with free veinlets, but somewhat obsolete when fresh. Petioles $\frac{1}{2}$ in.– $\frac{3}{4}$ in., sub-terete, channelled above, soft, pubescent; cauline stipules (*ochreae*) large, truncate, nerved, pubescent on nerves. Flowers irregularly disposed, usually in axillary racemes 2 together; racemes rather slender, nodding, 2 in.– $2\frac{1}{2}$ in. long (sometimes panicled with 3 basal branches from 1 peduncle, and sometimes in a large loose panicle 5 in.–6 in. long, distantly and gracefully branched in 8–12 racemes), vaginant; vagina rather large, very membranous, sub-pellucid, cup-shaped, margin laciniate; the flowers sub-fascicled 2–4 from each vagina, largely exserted, close-set but not crowded; pedicels jointed, capillary, 2 lines long. Perianths pale-green (sometimes, but rarely, with bright-red bases), 2 lines diameter, membranous, free from ovary, glabrous; lobes shorter than nut, broadly spatulate, not cut to base; sinuses broad; tips rounded. Stigmas 3, sub-clavate-orbicular, papillose, spreading; anthers very minute, abortive. Nut black, shining, broadly elliptic, 2 lines long, triquetrous, one side broader and flat, free from perianth.
Male (also, sometimes, hermaphrodite): leaves much smaller. Racemes axillary and terminal, slender, simple, 1 in.–2 in. long; floral bracts distant; 4–5 flowers in 1

sheath; perianth membranous, greenish-white, sub-campanulate; tube longer than lobes, free; stamens longer than perianth (and nut), flexuous, spreading; anthers exserted, orbicular, emarginate and cordate, didymous, red. Nut sometimes as in female.

Hab. In woods south of Dannevirke, County of Waipawa; 1888: W.C.

Obs. This is a pleasing, handsome, and striking species, [101] from the extreme gracefulness of its slender pendulous open racemes, and the regular shape of its peculiarly-formed leaves. Sometimes the leaves of other and allied species assume a contraction in the middle, giving them a kind of sub-panduriform shape, but none are so deeply and so regularly lobed as these. This character pertains alike to both *male* and *female* plants, although the leaves of the male plant are very much smaller than those of the female.

4. *M. truncata*,⁴⁵⁸ sp. nov.

A slender rambling climbing twining shrub, rising to 8 ft.—9 ft. among shrubs and trees. Branches very long and slender, flexuous, closely twining, thickly pubescent; hairs very short, red. *Fem.:* leaves membranous, numerous, scattered, sometimes fascicled in pairs, broadly oblong, $\frac{1}{2}$ in.— $\frac{3}{4}$ in. long, sides straight, tip obtuse rounded rarely apiculate, base truncate; dull pale-green, glabrous, wavy, opaque; margins entire, red; veined, veins slightly anastomosing. Petiole very slender, almost capillary, 4—5 lines long, puberulous. Cauline bracts long, truncate, margins entire. Flowers disposed in

458 Possibly *Muehlenbeckia complexa* (A.Cunn) Meisn.

simple short racemes $\frac{1}{2}$ in.–1 in. long, and 5–12-flowered; raceme vaginant; sheaths small, reddish, funnel-shaped, oblique, with 1 long stout excurrent nerve; margins finely serrate. Pedicel short, scarcely longer than sheath, with a single narrow line of pubescence. Perianth small, shorter than nut, whitish or very pale-green, very membranous, free; lobes oblong, obtuse, appressed and spreading, not cut to base, 1-nerved; veins finely reticulated (*sub lente*). Nut very small, about 1 line long, sub-rhomboidal or broadly lanceolate, trigonous, sides equal, angles obtuse, ridges irregular, brownish-black, dull not glossy. Style 0. Stigmas 3, large, flabellate-orbicular, spreading, plumose, reddish. *Male*: leaves smaller and slightly contracted at the middle. Flowers both axillary and terminal in simple short racemes $\frac{1}{2}$ in.–1 in. long, 8–15 on a raceme, usually a single raceme in a sheath; pedicel very short, scarcely extending to mouth of sheath. Perianth-lobes obovate, cut nearly to base; tips rounded, incurved. Stamens exserted, spreading, straight and slightly flexuous; anthers white, sub-orbicular-elliptic, margined.

Hab. In same locality as the preceding species, *M. trilobata*; but neither of these species was commonly observed, while the larger species—“*M. adpressa*, Lab.” (but ?)—abounds, attaining to a very large size, and forming impassable thickets; 1888: W.C.

Obs. This species is a more slender and implexed plant, and rises considerably higher, than *M. trilobata*: its smaller and fewer flowers, and entire strictly truncated and smaller leaves, arrest the attention at first sight when

compared, and [102] are grave differential characters; besides, the reticulated venation of the leaves of the two species is very dissimilar.

ORDER LXVII.—THYMELEÆ.

Genus 1. Pimelea, Banks and Sol.

1. *P. rugulosa*,⁴⁵⁹ sp. nov.

Plant shrubby, prostrate, spreading, forming small compact low bushes; main stems rather stout, 1 ft.—2 ft. long, much branched; branches ascending and erect, 8 in.—12 in. long, stoutish, straight, sparingly hairy; hairs greyish, short, adpressed in small detached patches between the leaves, but never near their bases; bark pale reddish-brown. Leaves decussate, not close, about 1 line (sometimes 2) apart, patent, decurved, thickish, glabrous, sub-glaucous-green, minutely and regularly marked with light-grey scurf, sub-papillose on under surface, narrow oblong, obtuse, 2–3 lines long, margined; margins (and petioles) bright-red; midrib indistinct; floral leaves slightly larger and broader; petioles short, stout, glabrous, transversely wrinkled below. Flowers sub-terminal, capitate 3–5 together, sessile, closely compacted, with a thick bunch of erect white hairs at their bases. Perianth hairy, 3½ lines long, the lower half of tube rose-coloured turgid and rugulose, the upper portion slender and (with the limb) white; lobes broadly ovate, obtuse, spreading, recurved, longer than the white portion of the tube, their

459 Probably *Pimelea prostrata* (J.R. & G.Gorst.) Willd..

lateral margins slightly incurved. Stamens rather long, exserted; style much longer.

Hab. Open plains, Tahoraiti, south of Dannevirke, County of Waipawa; 1885–88: W.C.

Obs. A species having pretty close affinity with *P. prostrata*, Vahl., of which species Hook.f. gives no less than three indigenous varieties; but this plant possesses characters differing from them all.

ORDER XI.—CYPERACEÆ.

Genus 6. *Isolepis*, Br.

1. *I. novæ-zealandiæ*,⁴⁶⁰ sp. nov.

Plant very small, densely tufted, sub-erect, slightly branched at base; roots numerous, short, fine, wiry, red; culms and leaves green above, reddish below. Culms about 1 in. long, leafy (3–4) below spikelet, semi-terete, channelled on upper surface, tips sub-acute. Leaves a little longer than culms, filiform, linear, much dilated and clasping at bases; tips very obtuse, drooping; leaf-sheaths (2 or more) loose, truncate, with a short erect obtuse point. Spikelet solitary, sub-sessile, lateral at or below middle of culm, small, ovate, about 1 line long (rarely 1½), few-flowered, elongating after flowering; and [103] the lower glumes and nuts falling off gives it the appearance of being peduncled. Glumes few, broadly oblong, 1 line long, concave, 1-nerved, nerve percurrent; centre green, thickish; sides straight, entire, very

460 *Isolepis basilaris* Hook.f.

membranous; tips sub-acute, thickened. Stamens 3, long, flexuous. Nut minute, about $\frac{1}{36}$ in. diameter, orbicular, tipped with a small point, black, finely papillose, slightly turgid, a little produced at base. Style long; stigmas 2, long, spreading, scaberulous.

Hab. Sides of watercourses in low grounds, Hawke's Bay; 1880: W.C. Also *Mr. A. Hamilton*; 1887.

Obs. This little plant is closely allied to another small New Zealand species, *I. basilaris*, Hook, f., but differs from it in its still smaller size, solitary spikelet, broader and fewer glumes with their mid-rib not "excurrent," orbicular black nut, and 3 stamens. This species is also allied to *I. acaulis*, F. Muell. (*Scirpus humillimus*, Benth.—"Fl. Austral.", vol. vii., p. 324).

Genus 14. *Carex*, Linn.

1. *C. picta*,⁴⁶¹ sp. nov.

Rootstock hypogaeous, creeping, very stout, woody, irregular, knotty and branched, coarsely covered with large striate brown imbricating scales. Leaves (and culms) pale-green, very narrow, linear-acuminate, ascending, flexuous, recurved; rather closely fascicled in fours, the outer leaf the broadest, truncate, sheathing 1 in. from base, 3 in.—6 in. long, $\frac{1}{20}$ in. wide at base, flat, smooth, 2-nerved, striate, upper surface channelled, tips filiform, obtuse, their margins minutely and closely (but not harshly) serrulate. Culms filiform, 3 in.—4 in. (rarely 5 in.—6 in.) long, sub-flexuous and ascending, drooping, subtrilateral, striate, edges rounded smooth. Spikelets 1—3

461 *Carex colensoi* Boott.

(usually 2, very rarely 3), narrow ovoid and broadly lanceolate, rather slender, 3–4 lines long, shortly peduncled, dark-brown, bi-bracteolate; bracts erect, filiform, the lower $\frac{3}{4}$ in.– $1\frac{1}{2}$ in. long, the upper much shorter, one-third to one-fourth the length of the lower, coloured brown at base, with their basal margins much dilated; tips minutely serrulate (*sub lente*) as in leaves. Glumes large, very broad, orbicular-ovate, variegated, nerve at centre stout, bright-green, sides dark purple-brown, margins white and very membranous, pellucid, delicately and closely reticulate, extending beyond apex of nerve, tips rounded and sometimes emarginate; the lowest glume sub-aristate. *Male* flowers below occupying more than half of spikelet; anthers exserted, linear, very narrow, rather long, bright-yellow; stamens white, flexuous. *Female* flowers few; style very long twice the length of utricle, papillose-scabrid; stigmas 2, very long, spreading, flexuous and curly, brown. Utricle semi-terete, small, green (brown when quite ripe), broadly [104] lanceolate, beaked, many-nerved, glossy; margins of the upper half (not apex) largely serrate; tip truncate.
Achenium lanceolate.

Hab. Half-concealed among low herbage, open grassy plains at Tahoraiti, south of Dannevirke, County of Waipawa; 1887: W.C.

Obs. This little species has pretty close affinity with *C. colensoi*, Hook.f. It is, however, a smaller plant, differing in several characters, particularly in its broader and flatter leaves, its fewer and slenderer spikelets, broader and tri-coloured glumes, with larger membranous margins, narrower and beaked utricles, long scabrid styles and

stigmas, and narrow (not “orbicular”) achenium (as shown in dissections of *C. colensoi*—“Fl. N.Z.,” tab. 63B).

2. *C. polyneura*,⁴⁶² sp. nov.

Plant loosely tufted, branched below, spreading, light-green. Culms erect, 7 in.—9 in. high, smooth, bluntly triquetrous, leafy. Leaves sub-rigid, linear very acuminate, 8 in.—9 in. long, $\frac{1}{4}$ in. wide near base, flat, smooth, shining, channelled, much striate (sub 22-nerved), sheathing; sheaths membranous, sub-truncate, bifid and sub-laciniate, coloured; ligule large, diagonal; keeled, upper portion of keel scabrid; margins slightly recurved and finely serrulate, most so at tips; tips filiform, acute, recurved. Spikelets 5–6, erect, axillary, bracteolate, rather distant, $\frac{1}{2}$ in. long, cylindrical, stoutish, obtuse, the lowest peduncled; peduncle slender, rigid, 1 in. long; the top one wholly male, narrow, obovate; the others with few or no male flowers at their bases; the lower bracts long and leafy; the upper ones very narrow, short, erect. Glumes broadly ovate, bifid, purple, closely reticulated; margins membranous and finely laciniate; awned, awn as long as and longer than the glume, green, rigid, sharply and closely serrulate. Utricle longer than glume, sub-orbicular or broadly elliptic, 1 line long, turgid, smooth, shining, convex on the outer side, slightly concave on the inner, somewhat beaked, bifid, pale-greenish below, dark purple-brown above. Stigmas 3, short, pinkish, very scabrid. Anthers long, linear, brown; tips acute.

462 *Carex dissita* Sol. ex Boott.

Hab. Edges of streamlets, woods, south of Dannevirke, County of Waipawa; 1887: W.C.

3. *C. longiacuminata*,⁴⁶³ sp. nov.

Plant large, dark-green, tufted with short surculi. Culms stout, erect, 2 ft. 9 in.–3 ft. high, leafy, smooth, angles obtuse; bract-leaves long, the lowest longer than culm, 4 lines broad, keeled, margins and keel finely and closely serrulate. Leaves shorter than culm, same width, &c., as bracts, slightly rigid, [105] drooping at tops, finely acuminate almost setaceous, tips acute, many-nerved (sub 26), margins widely membranous below; the outer leaves much shorter and not so acuminate; the basal leaves very short, blackish, acute. Spikelets 6, erect and large, 1½ in. long, stout, cylindrical, peduncled; the 2 lower very distant, the 4 upper close together, the topmost narrow and wholly male; each of the 5 lower ones with a few male flowers at its base. Sheaths long, 2 in.–1½ in. from nodes, closely adpressed. Stigmas 2 (sometimes 3), erect, stout. Glumes light-brown, glossy, very membranous, semi-pellucid, largely bifid; lobes laciniate aristate, arista long (very long on lower glumes, so as to cover the arista next above), green, sharply and strongly serrate. Utricle 1½ lines long, dark umber-brown, glossy, sub-rhombic-ovoid, turgid and slightly uneven, minutely scabrid (5–6) on upper margins, finely (almost obsoletely) striate; beak bifid, short, broad.

Hab. Low swampy ground, margins of woods, south of Dannevirke, County of Waipawa; 1888: W.C.

463 *Carex dissita* Sol. ex Boott.

ORDER XII.—GRAMINEÆ.

Genus 2. *Microlæna*, Br.1. *M. ramosissima*,⁴⁶⁴ sp. nov.

A large decumbent straggling and sub-ascending perennial grass, rising and creeping over low shrubs and bushes; dark-green; main stems as stout at base as a goose-quill, hard, solid, 7 ft.–8 ft. long, with several short sheaths at base, much branched; branches long, slender, leafy. Culms 4 ft.–5 ft. long, knotted; nodes 3 in.–5 in. apart, with long ovate-acuminate sheath-like bracts 2 in.–3 in. long, light-brown, nearly amplexicaul at outer base of each node, distantly leafy throughout, stout, cylindrical, solid, 2 lines diameter at base; the lower leaves 8 in. long, $\frac{1}{10}$ in. wide, linear acuminate, striate, many-nerved (5 of them being stout and prominent); margins minutely scaberulous, recurved and red; tip long, filiform; the upper leaves reaching close under panicle, 4 in. long, very narrow almost filiform, $\frac{1}{30}$ in. wide, acute; sheaths 2 in. long, extending half-way between nodes, rigid, striate, with a few fine long hairs at the mouth; ligule small, semi-circular, somewhat chaffy, reddish, thickened. Panicle terminal, lax and sub-erect, 4 in.–5 in. long, narrow, distantly branched with 4–6 simple branches, each containing 3–4 pedicelled spikelets; pedicels long, $\frac{1}{2}$ in.– $\frac{3}{4}$ in., wiry, flexuous and (with rhachis) minutely scaberulous. Spikelet 8 lines long awns included, pale-green. Glumes, lowest pair small, persistent, whitish, spreading, the outer one very minute

464 *Microlaena polynoda* (Hook.f.) Hook.f.

one-third the length of the inner which is about 1 line long, ovate, tip retuse and jagged; the 2 following empty glumes awned, unequal, the outer one [106] 6 lines long, lanceolate-acuminate, 5-nerved, keel and margins scabrid, margins hyaline, with a small tuft of hairs at the base; the next 8 lines long including the long awn, narrow ovate-acuminate, 7-nerved, the awn long nearly $\frac{1}{4}$ in., setaceous, straight, scabrid, acute; the uppermost or flowering glume 3-nerved, margins hyaline, the lower two-thirds entire, slightly scaberulous on keel, tip irregular jagged and scabrid; awn short and stout. Pale 3 lines long, linear-lanceolate, 1-nerved, tip obtuse, margins of the lower half entire, of the upper half and tip scabrid ciliate. Scales sub-flabellate or sub-quinquilateral, 7-nerved, tip produced, margins irregular and laciniate. Anthers 4, linear, $2\frac{1}{2}$ lines long, both ends bifid, scarcely exserted. Stigmas long, diverging, ovate-acuminate, bushy, much branched, branches compound. Ovary oblong, sub-truncate. Grain not seen.

Hab. In a thicket on the banks of a small streamlet south of Dannevirke, County of Waipawa (and only in that locality); 1887–88: W.C.

Obs. This species is pretty closely allied to *M. polynoda*, Hook f., but differs from that species in several particulars—as, in its much longer and branched panicle, with long pedicels to the spikelets; in the tuft of hairs at the base of the inner pair of empty glumes, and in both of them being long-awned; in the difference in their nervature, in the tip of the pale being obtuse and ciliate; and in the form and nervature of its scales. It is, also, a larger and more robust plant.

Genus 12. Apera, Adanson.

1. *A. purpurascens*,⁴⁶⁵ sp. nov.

A tall erect and nodding densely-tufted graceful perennial grass, having numerous short stout striate sheaths, with long sub-aristate mucros at base. Stems slender, distantly leafy, knotted, striate, smooth, 2 ft. long. Culms 3 ft.–3 ft. 6 in. high, smooth, slender, nodding, purple above pale straw-colour below, 8 in.–10 in. long downwards from panicle. Leaves membranaceous, narrow, 9 in.–10 in. long, 1½ lines wide, sub-glaucous and striate above, edges and midrib slightly scaberulous, tips finely acuminate, setaceous; sheaths long, ciliate at top and margins; ligule membranous, truncate, produced in front, very short behind. Panicle large, nodding, pendulous, 2 ft.–2 ft. 10 in. long, very open, loosely whorled, the lower whorls distant, 3 in.–4 in. apart, each containing 6–8 spreading capillary branches, the two largest 6 in.–7 in. long and twice whorled, their branchlets sub-rigid, angular, compressed, flexuous, scaberulous. Pedicels 4–5 lines long, wiry, flexuous, scabrid, thickened at tips. Spikelets small, $\frac{1}{10}$ in. long, purple. Empty glumes longer than the flowering ones, sub-ovate-acuminate, 1-nerved with slightly scaberulous [107] keels; tips membranous, jagged; the outer very narrow and finely acuminate, the inner and larger one sub-aristate. Flowering glume ovate, 1-nerved, aristate; awn $3\frac{1}{2}$ lines long, three times, the length of spikelet, scabrid, flexuous and straight. Pale linear-oblong, tip obtuse, jagged.

465 *Anemanthele lessoniana* (Steud.) Veldkamp.

Stamen 1, short; anther narrow oblong, emarginate, cordate. Grain 1 line long, lanceolate, truncate.

Hab. Edges of streamlets in woods south of Dannevirke, County of Waipawa, flowering in February; 1887–88:
W.C.

Obs. This is a truly elegant grass; and when it is found growing in large tufts among small ferns, in rather open spots on the borders of the streams, with a rich profusion of numerous gracefully-pendulous panicles, purple and glistening in the sun, it is a most striking object—one sure to rivet the attention of the privileged beholder. It differs in several characters from the other only known indigenous species of this genus, *A. arundinacea*, Hook, f., and is a far more handsome plant.

Genus 14. *Agrostis*, Linn.

1. (?) *A. striata*,⁴⁶⁶ sp. nov.

A small slender erect glabrous annual grass, 5 in.–6 in. high; stems with 3–4 distant nodes. Leaves few, on stems 1½ in. long, 1/30 in. wide, striate; margins minutely scaberulous (*sub lente*); ligule long, narrow, sub-acute, erect, hyaline, jagged at tip. Panicle erect, open, free, 3 in. long, rhomboid in outline, distantly whorled, the lowermost having 5 unequal capillary rigid flexuous branchlets, the largest being 1½ in. long and whorled about the centre, all minutely scaberulous; each branchlet usually bearing 2 distant spikelets; pedicels much thickened at base of spikelet, that of the lower spikelet short, of the upper long. Spikelets 1/10 in. long,

466 *Lachnagrostis striata* (Colenso) Zotov.

membranous, whitish, shining; the two empty glumes nearly alike, much spreading, sub-linear-lanceolate, acuminate, very acute, tips purple, nerveless, but with many longitudinal minutely zigzagged purple striæ forming linear cells, scabrid on back and at margins which are hyaline. Flowering glume small, oblong, sub-truncate, $\frac{1}{16}$ in. long, striate, 3-nerved, greenish, hairy, awned, a small lateral tuft of hairs on each side near base; tips laciniate, jagged, and very hairy with long spreading hairs; awn short, stout, coarsely scabrid, springing from one of the lateral nerves a little way down the back. Anthers oblong, truncate, emarginate. Grain $\frac{1}{2}$ line long, sub-oblong-lanceolate, obtuse, narrower at apex, turgid, shining, pale ochraceous.

Hab. High lands in the interior near Lake Waikare, County of Wairoa; 1888: *Mr. H. Hill.*

Obs. This curious little mountain species is widely different [108] from all of this genus known to me; hence I have provisionally placed it here. I have only had a few half-withered and somewhat imperfect specimens for examination, which seem to have been accidentally collected with other small herbs.

**1888 A description of a new and large Species
of orthopterous Insect of the Genus
Hemideina, Walker.**

Transactions of the New Zealand Institute 21: 193-
194.

[Read before the Hawke's Bay Philosophical Institute,
12th Nov. 1888.]

INSECTA.

ORDER. ORTHOPTERA.

Section. SALTATORIA.

Fam. LOCUSTIDÆ.

Genus Hemideina.

1. *H. nitens*,⁴⁶⁷ sp. nov., Col.

Female.—Piceous slightly convex, very glossy. Head small, dark (almost black), smooth with a stout keel between the eyes which is forked between antennæ; eyes very prominent, almond-shaped broad end above horns; antennæ (tips broken off) 1 $\frac{3}{4}$ in. long, sub-moniliform, thickly pubescent, less so at base; clypeus blackish with a transverse brown band; labrum brown; labium black; palpi brown, fifth joint pubescent (also fourth, but less so), tip oval-spathulate; labial palpi slightly hairy, tip broadly-oblong. Prothorax (thoracic shield) much curved, 8 lines long, 4 lines wide, sub-rugulose, margined, anterior margin minutely ciliate, tawny brown with deeply indented rather coarse black markings (somewhat like [194] a broad full face with spreading horns); pronotum thickish; shield-like, margined, both it and

467 *Hemideina thoracica* White A..

mesothorax very dark; abdomen slightly compressed, clouded; abdominal segments darker below, increasing in hue towards tip; oviduct large, very thick at base; 10 lines long, curved, brown almost piceous. Legs stout; femora with 2 (sub 3) rows of black coarse oblong spots on each side; hind femora with a row of large black spines on lower margin (which is also black), and 2 minute ones inside of the row; the 4 anterior femora smooth; 4 anterior tibiæ with 5 black spines on each side; hind tibiæ very stout, black, with 4 long black spines on the outer side and 5 on the inner side, the third and fourth of the inner ones very long ($\frac{1}{8}$ in.) and sharp, and 2 small spines distant on the upper ridge; the posterior femora and tibiæ of about equal length—11 lines long; the anterior tibiæ with a pair of spines at the lower joint, upper side; the middle tibiæ with a single spine there; the posterior tibiæ with 2 pairs of spines ditto; tarsi piceous, almost black, slightly hairy; hairs short, patent; pulvilli thick, tumid, blackish, shining. Length of body 16 lines.

Hab. Found in firewood obtained from Forty-mile Bush, County of Waipawa, 1888; per Mr. A. Hamilton.

Obs. A peculiar species, differing from other described ones in its general very dark colour, extreme glossiness, having also a sub-metallic cupreous glow in several places, peculiar broad and coarse femoral markings, extra spines, remarkably thick and smooth tumid pulvilli, and hairy antennæ. I regret much the upper portions of the antennæ being wanting.

**1888 Notes on a peculiar Chrysalis of an
unknown Species of butterfly. *Transactions of
the New Zealand Institute* 21: 194-196.**

[Read before the Hawke's Bay Philosophical Institute,
8th October, 1888.]

LEPIDOPTERA.

Section RHOPALOCERA.

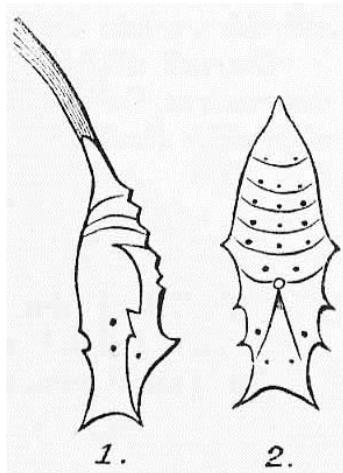
Fam. NYMPHALIDÆ.

IN the summer of 1887 (February), while botanising in the secluded forests and glens south of Dannevirke, I came upon a curious living chrysalis of a form hitherto unnoticed by me. It was attached to a branch of a species of *Galium*,⁴⁶⁸ a large [195] prostrate plant, and, believing it to be new, I carefully secured it and brought it to Napier. As I expected it would shortly emerge in its imago state, I took accurate notes of this chrysalis in its fresh and living state, also a drawing of it, which I now give. I failed, however, in seeing the perfect insect, as the chrysalis never developed, but lost its original colours and decayed. I suppose it must have received some bruising in carriage, &c., although I took every possible care, having also formerly reared perfect insects of *Pyrameis gonerilla*, *Danais berenice*, *Dasypoda selenophora*, and others. It may be, however, only the pupa state of one of our known New Zealand butterflies, and also known to our colonial lepidopterists, who will in that case immediately recognise it from my description. It

468 WC: *Galium triloba*, Col., sp. nov., "Trans. N.Z. Institute," vol. xx., p. 192. (I have since detected this curious species growing profusely prostrate in large beds.)

was certainly both very peculiar in shape and richly adorned in colours.

Description.—Chrysalis: Suspended by a stout web from its tail (none around the body), oblong (outline form), 10 lines long, 4 lines broad; somewhat sub-angular and rough, with many small muricate projections; colour olivaceous, smooth yet finely corrugated, glossy, with minute short wavy transverse black veins; the thorax and head having a semi-metallic glistening appearance, as if finely powdered with gold dust, with 6–8 large and more defined bright gold-like round spots on underside of thorax and head. Head broad, truncate and retuse almost bifid, acutely 2-horned at outer angles; sternum largely produced and very acute; tail produced, tip blackish, $\frac{1}{2}$ line long, curved with a stout silken band 3 lines long; back flattish, with 4 small sharp points (2 pairs) near the centre and 2 larger on each side (edge of wings) nearly in the same lateral line, and 1 smaller on edge near fourth abdominal ring, and 5 blackish spiracle-like slits in a curved line from fourth abdominal ring to tip of tail; several fine longitudinal black lines running from each side of horn to the fifth and largest ring of abdomen, the outer pair of lines regularly studded their whole length with minute raised points; 3 large posterior black rings and 4 sub-obsolete anterior ones on abdomen underside; 8 pairs of acute points (feet) in 2 longitudinal lines, with 6 smaller central ones in a longitudinal line on abdominal rings; and a shining blackish disc with raised margin in centre of thorax under sternum. [196]



1. Side view. 2. Front view.
Chrysalis $\frac{10}{12}$ inch long; slightly enlarged.

Obs. This chrysalis somewhat resembles in form that of *Vanessa io*. Viewed in front its prominent sternum, &c., bears a likeness of the human face in ludicrous miniature. I have ventured to classify it under the family of *Nymphalidae*, from the fact of its only suspending itself by its tail. I am aware that the sub-family of *Libythæinæ* (Fam. *Erycinidæ*) does the same, but hitherto (as far as I know) none of this sub-family has been found in New Zealand.

Should any of our colonial lepidopterists, who may see this notice, be already acquainted with this form of pupa, and also with its perfect insect, I will thank him to inform me of it.

**1888 A few Notes on the Economy and Habits of
one of our largest and handsomest New
Zealand Butterflies (*Pyrameis gonerilla*).
Transactions of the New Zealand Institute 21: 196-
199.**

[Read before the Hawke's Bay Philosophical Institute,
8th October, 1888.]

A FEW years ago, during my visits to our inland forests, I often had to pass close to a large shrubby *Urtica*,⁴⁶⁹ and I invariably saw several of our large and handsome butterfly, *Pyrameis gonerilla*, hovering over it or settled on it. The shrub itself was in a sheltered sunny nook; and on one day in particular in early spring I counted no less than seventeen of these beautiful creatures at one time so engaged about that shrub, which none of them seemed desirous of leaving. It was a truly lovely scene which I well remember. Spring's woodland harbinger, the large-flowered clematis (*C. indivisa*) was pretty well-developed overhead, swinging and displaying its long wreaths of peerless and pendulous virgin-white tresses from the lofty trees up which it had climbed when young; around were the many beautiful and stately tree-ferns, while below the ground was thickly carpeted with that neat close-growing bedding plant, with small and regularly-formed emerald foliage, *Pratia angulata*, expanding thankfully its myriads of white and blue star-like blossoms to the morning sun, and so drinking in life. The sun, too, was shining brightly down from the deep concave of the dark-blue sky, rarely flecked by a passing

469 WC: *U. ferox*, Forst., or a closely allied and undescribed species:
U. pungens, MSS.

cloud; while the melodious tuis (*Prosthemadera novæ-zealandiae*—parson-bird of the colonists), having had their breakfast of honey and nectar, were singing away joyfully and with good courage from their tiptop perches on the highest sprays, their dark and lustrous metallic plumage reflecting the rays of the sun. It is worthy of notice that this handsome and highly melodious bird always selects the highest and bare spray of a tall tree for its music-stool, [197] whence to pour forth its gushing notes; and this habit is more particularly observed by them soon after sunrise and at sunset, when to hear them of a fine summer's evening, when all is calm above and still below, is really ravishing. At such times the song by Capern, called "The Old Grey Thrush," has come forcibly to mind. As some of you may not know it, permit me to give part of the first stanza:—

Of all the birds of tuneful note
 That warble o'er field and flood,
 O, give me the thrush with the speckled throat,
 The king of the singing wood!
 For see, he sits on the topmost twig
 To carol forth his glee,
 And none can dance a merrier jig,
 Or laugh more loud than he.

The whole of that song is apt (for the tui), and well worth repeating. To return, however:—altogether it was a pleasant time; all nature seemed in harmony; even the murmur of the rippling waters of the neighbouring brawling stream joined in unison, and conveyed a more soothing cadence than usual to the ear; and the briskly flitting butterflies above all appeared to be revelling in

luxury, enjoying themselves and making the most of it. At such seasons snatches from the once popular song of fifty or sixty years ago, and long forgotten, “I’d be a butterfly, born in a bower,” &c., would come rushing rapidly along through the dark lanes of encumbered memory into broad daylight. I remember well, standing entranced, as it were, for several minutes, contemplating and admiring the scene before me ere I could bring myself to resume my journey, and dive into the deeper and gloomy recesses of the forest.

That is a faint and brief description of what I saw there at that grand butterflies’ ball and feast, in the early spring.

On a subsequent visit to that spot, one day in the autumn (28th April), on examining the *Urtica* shrub, I found 3 larvæ and 2 chrysalides of the *Pyrameis* on it: the larvæ feeding on its leaves, the pupæ hanging from it. The pupæ were suspended by a few tiny threads under a leaf, or within a leaf (or sometimes two leaves), the edges being very slightly drawn together with threads, but not closed up, remaining more than half open. In taking these rudimental insects, and gathering some of the leaves of the *Urtica* for the larvæ to feed on, I somehow got stung rather severely, in spite of all my care. I well remember the sharp permanent pain from the sting of that nettle, which lasted four days,⁴⁷⁰ and was always increased through washing or wetting my hands. [198]

470 WC: Since writing the above I find the same fact already recorded—“Fl. N.Z.,” vol. i., p. 225, and “Handbook Fl. N.Z.,” p. 252—I having forty years before experienced the same discomfort.

Four days after I again visited that spot and *Urtica* shrub for the last time that season (as I was to return to Napier the next day), and found 3 more larvæ and 2 chrysalides, and brought them all away. Arriving at Napier on the 2nd May, I placed the larvæ, with a quantity of fresh leaves, in a large white glass bottle; on the 4th, one of the larvæ had suspended itself to the (bored) cork of the bottle; on the 6th it cast its larva-skin and partly took up the chrysalis appearance, but was very wet at first; and on the 7th it assumed the true chrysalis aspect. On the 9th another of the larvæ hung itself to the cork, head downwards, and commenced its transformation. On the 11th one of the chrysalides dropped off from the cork; I had noticed that this one was smaller and of a lighter colour. On the 18th another of the larvæ entered into its chrysalis state, also attaching itself to the cork of the bottle.

On the 19th one of the chrysalides I had brought in that state from the forest burst, and the perfect insect emerged; but, owing to the shallowness of the glass in which these forest chrysalides were confined, one wing had got stuck fast to the side of the bottle in the process of emerging, and so became contracted and rigid when dry, like a little plaited epaulette; while the other wing, being free, had attained to its full size and shape; but the poor creature was sadly lopsided. On the 21st another of the forest chrysalides split open, and the imago emerged—a beautiful sight,⁴⁷¹ once seen, never to be forgotten.

WC: 471 See the full description of similar emergence of *Danais berenice*, as witnessed by me ("Trans. N.Z. Inst.", vol. x., p. 279).

A thing of beauty is a joy for ever.

This was a fine and perfect specimen of this butterfly.

I regretted much those larvæ that entered into their pupa state here in Napier not emerging therefrom as perfect insects. I suspect this was owing either to their not having been fully fed down to the time of their entering into that state, or that they assumed it too early, and perhaps in an unhealthy state. As larvæ they were very voracious; it seemed as if they were always eating, night and day; so that my stock of *Urtica* leaves that had cost me so dearly were soon disposed of. On their being used up I tried the hungry creatures with several other leaves of Maori plants, but none would they touch. That shrub itself, though a large bushy and spreading one (about 5 ft. high and several feet round), with several others, smaller ones, close by, almost always presented a sorry sight from their leaves being so gnawed and stripped; hence I had always some difficulty in procuring good specimens of it for drying and preserving. Those *Urtica* plants, however, recovered themselves throughout the winter, and were fully [199] foliaged in early spring. I may also mention that, though the plant was said to be well known in that locality, I only met with it in one other spot, and that a single small specimen.

Seeing that the larvæ in their purely natural state always either suspend themselves to a twig or enwrap themselves in a leaf of the *Urtica*, it seemed strange that in no case did one of them so suspend itself to a stem in the bottle, but only and always to the cork (of course there were no leaves left). Was this done on account of more moving air there through the holes—such being

requisite to dry their wings quickly when emerging—or to be in a position of more free space?

As I suppose both larva and pupa of this butterfly to be, like the perfect insect, well known, I do not attempt to describe them. The larva is a curious-looking object, from its being so very hairy; the hairs, too, are rather long, rigid, patent, dark-coloured, and produced in little bunches of irregular lengths.

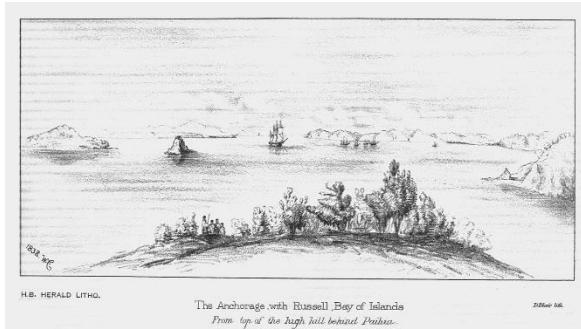
Notwithstanding my partial failure in the rearing of them, a few plain facts in the natural economy of this butterfly seem to be substantiated: (1) That its larvæ feed on the leaves of *Urtica ?pungens*, Col., and are very voracious; (2) that on their entering into the chrysalis state they wrap themselves loosely in a leaf of the same plant, to which they are also fastened, or suspend beneath a leaf from its petiole or branchlet; (3) that the time occupied by the embryo insect in its chrysalis state is more than three weeks; (4) and that if it has not ample room for unfolding its wings on emerging from the chrysalis state they become stunted and useless, and then of course the insect is destitute of flight.

ADDENDUM.

I may here mention a similar case, as to contraction of wings under similar circumstances, that occurred a few years ago. In 1884, in a case of apples received from America (? California), I found a fine butterfly; one quite as large as our New Zealand *Pyrameis gonerilla*, if not much larger. It was but recently dead, and had evidently died in the case during the voyage; both of its wings were much crumpled and contracted, and its back chafed. Its prevailing colours were yellow and black (bluish-black)

in broad streaks, the body the same, with broad yellow longitudinal stripes; very hairy at edges of wings in some parts; hairs long, yellow; and two large red spots on the wings; antennæ very dark, slender, naked; tips slightly clubbed; eyes very large and prominent. Being much crumpled, an only specimen, and tender, I only give its more striking aspect, as it requires to be softened and carefully laid out, before a strictly accurate description could be given. It is wholly unknown to me.

1888 Fifty years ago in New Zealand; a commemoration; a Jubilee paper; a retrospect; a plain and true story. Napier, R.C. Harding. 49p.



The Anchorage, with Russell, Bay of Islands.
From top of the high hill behind Paihia.
H. B. HERALD LITHO. D Blair, lith. 1838 W.C.

*Read before the Hawke's Bay Philosophical Institute,
October 17th, 1887. by William Colenso, FRS, FLS, etc,
Honorary Member of the Institute.*

*(Published under the auspices of the Board of Governors
N.Z.I., and with the approval of the Council H.B.P.I.)*

“Build me straight, O worthy Master!
Staunch and strong, a goodly vessel,
That shall laugh at all disaster,
And with wave and whirlwind wrestle.”

LONGFELLOW: “*The Building of the Ship.*”

“Quaeque ipsi vidi, et quorum fui.”⁴⁷² — VIRG.

— “We cannot express any truth without involving ourselves in some degree of error or occasionally conveying an impression to others wholly erroneous.”

— PROF. JOWETT.

Napier **PRINTED BY R.C. HARDING, HASTINGS-STREET.** 1888 [2]

Extract from a Circular issued by the Council of the Hawke's Bay Philosophical Institute, 18th June, 1888.

The twentieth volume of the *Transactions of the New Zealand. Institute*, which is now being issued, does not contain the extremely valuable and interesting “Jubilee Paper” read before this Society by Mr. Colenso in October, 1887; and on enquiry the Council find that owing to retrenchment and general lack of funds, this Paper has been “deferred,” together with many others.

Seeing that the Paper contains a long and excellent account of the Introduction of the Printing Press into New Zealand, and of the printing of the New Testament in the Maori tongue in 1887 (fifty years ago), together with many collateral and little-known facts and items of colonial and public interest, the Council took steps to procure the return of the Paper from the Governors of the New Zealand Institute, with a view to its publication.

472 Actually “quaeque ipse miserrima vidi, & quorum pars magna fui”= and those (terrible) things I saw, and in which I played (a great part).

The Board replied as follows: – “The Board very much regret being unable to publish the paper in question, and have therefore directed me to return it as requested.... The Board expresses great satisfaction at the prospect of the publication of the Jubilee Paper in another form.

— (*Signed*) R. B. GORE, *Secretary.*” [3]

FIFTY YEARS AGO IN NEW ZEALAND.

A Jubilee Paper.

§ 1. PRELIMINARY.

THIS present year of grace 1887, has been, is, and will be long-known as, the marked “Jubilee” year; probably more so than any Jubilee that has ever preceded it since time began! This arises, mainly, from the fact of its ubiquity, or universal dissemination and observance, more or less throughout the whole globe. We here in New Zealand, the most distant of all the Colonies of the British Empire, situated at the very antipodes,—we have done our best in joining with thankfulness and acclaim in the carrying-out of the Jubilee of Her Majesty our most gracious Queen Victoria.

And in doing so the question has more than once arisen in my mind, whether we (or more strictly speaking, I) have not also a Jubilee to observe, to commemorate? Indeed, all of us who have passed the fiftieth Birthday have such a private Jubilee; which is stronger still when those who can do so (as in the case of Her Majesty), can look back over the long vista of fifty years of active life; and this is still further strengthened, when, in so looking back, we can specify some peculiar useful public work

undertaken and completed for the benefit of the people fifty years ago;—especially when such was begun and carried on and finished under singular trials and hardships and difficulties.

As I have reasons for believing, that I am the only one present who has dwelt more than fifty years in this country, I trust I shall be permitted to say at the commencement, (and, in so doing, to meet and cut short all anticipation and conjecture,)—that I do not intend to speak specially of that—my arrival in this land,—in this paper. The Jubilee, or fifty years commemoration of that time, expired nearly three years ago, and was then duly though privately observed by me; as well as a few others since,—special goals or landmarks of some important epochs in [4] my life now nearly drawing to its close; a select few of the more important of them I may briefly mention: viz.—

In the year 1835, the printing of the *first* book in New Zealand.

In the same year, the printing of the first *English* book.

In the same year (Dec. 25), meeting with the celebrated *Darwin* in the Bay of Islands, and spending a happy long day with him.

In 1836, the commencement of the printing the New Testament in *Maori*.

Having so far cleared the way, I may now state that my present Jubilee paper is intended to commemorate more particularly the completion of the printing of the New Testament in the Maori tongue at Paihia in the Bay of Islands in the year 1837—fifty years ago! an event that

caused a great sensation at the time, both in New Zealand and at Home, (although now, in part, forgotten,) and one that was productive of incalculable good to the Maori race: together with the introduction of the Printing-Press into this country; and also, the gradual formation of its present written Maori language;—with many peculiar and little-known circumstances pertaining to those prehistoric times, and incidental thereto.

And as I have had necessarily a prominent part (active or passive) in almost every successional item or subject that I have to bring before you, I trust, in my endeavouring to fairly and faithfully narrate the same, I shall not be deemed egotistical.

§ 2. INTRODUCTORY.

In the year 1833, the Church Missionary Society, having determined to send out a Printing Press and types and all necessary *material* to their mission in New Zealand, were seeking a Missionary Printer to be in charge. In the end of that year, I, then residing in London, was introduced to the Secretaries of that Society at their Mission house, and engaged to go out to New Zealand with the Press as a Missionary.

For various reasons matters were not soon ready; and it was June, 1834, before we left London for Sydney, New South Wales, *en route* for New Zealand. During the long interval, (after my return from the Country in the Spring,) I was [5] frequently at the large printing establishment of Messrs. Watts and Son, near Temple Bar, about the necessary requirements, (their types, &c, being all cast at their own foundry within the same building,) but all directions, orders, &c, respecting the same, were given

by the Under-Secretaries of the Mission-House to that firm without any reference to me. Well do I remember the answers that were returned to my repeated applications for an Imposing-stone, and for page-cord, (not to mention other things,)—"What! 'Coals to Newcastle'!! In that country where the New Zealand Flax grows everywhere wild, and the Natives are all adepts at making such beautiful lines and cords! and where the handsome Greenstone abounds!!!"—I briefly mention this here, as its sure results followed.—After a long passage of seventeen weeks our ship arrived at Sydney.

Here I make a short digression. What a difference! between the Sydney of that period and of to-day!! Then there was no steamer on her waters, and but few ships! then there were only three clergymen of the Church-of-England residing in all Australia;—two of them (the Reverends Messrs Cowper and Hill) in Sydney, and the Rev. S. Marsden at Paramatta. In order to get through their fixed Sunday (or weekly) duties, those Sydney Ministers were obliged to commence them on Saturday afternoons. During my stay in Sydney I assisted them as well as I could.

As no vessel could be found willing to leave for New Zealand, owing to their fear of the Maoris, we were obliged to remain eight or nine weeks at Sydney. At last, after much entreaty, a small schooner of 67 tons was got ready, and we sailed on the 10th December for the Bay of Islands. After a long and eventful voyage of twenty days, (suffering much from want of water, as well as from a complication of *peculiar* miseries!) we landed at Paihia Mission Station in the Bay of Islands, at 9 p.m. on the

30th December; and in the following few days got the Press, type, &c, safely on shore.

§ 3. THE PRESS IN NEW ZEALAND.

1835. Jan. 3. On this day we got the Press and heavy boxes of type securely landed; the lighter packages, including Bookbinders' standing- and cutting-presses, and tools, having previously been taken on shore. It was a very difficult matter [6] to land the printing-press safely, from the bulk and weight of the iron "*staple*" (it being a large Stanhope Press), and the vessel out at anchor in the harbour, with no wharf nor good landing-place, merely the natural sandy beach open to the ocean; the passenger-boats of the Mission Station being far too light, and the Maori canoes too small and crank; at last we managed it, by lashing two canoes together and so making a deck or platform on them, and working early in the morning before the sea-breeze began. The boxes of type would have been opened on board, but as the little vessel, owing to her novelty, was continually crowded by Maoris, (all of whom were very wild and rough, and some of them not very friendly,) it was thought the parcels of type might be seized for making musket-balls, then in very great demand. It was a matter of very great rejoicing to us when all our precious stores were safely on shore and without loss.

Speaking practically, however, our rejoicing was of short duration; for on unpacking the goods and stores I found many necessary articles to be absolutely wanting! For the information of Printers I will just set down a few of them; though I almost fear my relation will scarcely be believed. There was no wooden furniture of any kind, nor

quoins, (cast-metal furniture, so common now, not being then in use,) no galleys, no cases, no leads of any size, no brass rule, no composing-sticks, (save a private one of my own that I had bought two years before in London, a most fortunate circumstance!) no inking-table, no potash, no lye-brushes, no mallet and shooter, no roller-irons and stock, though there was a massy cast-iron roller mould, and (as I have already intimated) no imposing-stone nor page-cord; and, worst of all, actually *no printing paper!!* Moreover, in those days, as things then were, none of these missing articles could be obtained from England in a less time than eighteen months! while they might possibly be got from Sydney in six or eight months. –

Such was the state of things at the setting-up of the Press in New Zealand! At first, and for some considerable time, we hazarded the hope that the deficient printing stores, especially the large bales of paper, might have been left in the Agent's warehouses at Sydney, where the Press and types and Binding-tools had been long stored; but time revealed that such was not the case. Fortunately I found a handy Joiner in the Bay, who [7] soon made me two or three pairs of type-cases for the printing office after a plan of my own. For as the Maori language contained only 13 letters (half the number in the English alphabet), I contrived my cases so, as to have both Roman and Italic characters in the *one* pair of cases; not distributing the remaining 13 letters (consonants) used in the compositing of English, such not being wanted.⁴⁷³

473 WC: I may here observe, in a note, that such an arrangement proved to be a very good one while my compositing was confined to the Maori language only; but when I had any English copy to compose it was altogether the reverse! then I had to pick out the

My Joiner also made me a few galleys, and a small inking-table, and some furniture and quoins,—these last, however, were wretched things (partly owing to the want of proper and seasoned wood,) and gave me an enormous amount of labour, vexation and trouble!

§ 4. THE LOCATION OF THE PRESS.

The sudden arrival of the Printing-press in New Zealand, took the resident Missionaries at the Paihia Station by surprise. It is true they had asked for it from the Society, and the Society had promised to supply their wants, but no time was, or could have been fixed, and communication between them was very rare and irregular—about once a year. And during our long sojourn in Sydney we had no means of communicating with New Zealand. Paihia is a small flat on the sea-side, about half a mile long, having a sandy beach in front, a bold rocky headland at each end, and a steep hill at the back; in calm weather there is good landing from boats on the beach, but not so at other times. At this date there were three Missionaries with their wives and families living here,—the Rev. H. Williams, the Rev. W. Williams, and Mr. C. Baker; they resided in three separate and rather large houses, which with their houses for domestics, Carpenter's and Blacksmith's shops, and store-houses,

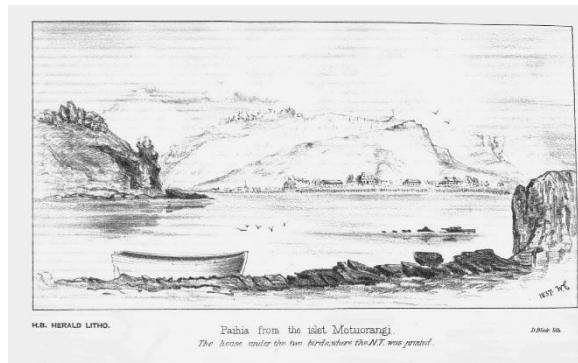
discarded English consonants as required from their lots put up in paper parcels. Fortunately this occurred but rarely; except at the time of the Treaty of Waitangi, (1840,) when I had necessarily much printing work to do for the Government of the Colony; and having no extra cases, was obliged to place the letters required in little lots on tables, and on the floor!—(See Note A, Appendix.)

and the Mission Chapel and Infants' School-house in the middle, composed the buildings of the Mission Station, making quite a little village. Fortunately it happened that a large and well-lighted room, [8] being one semi-detached wing of the house occupied by Mr. Baker, was just now empty; this room had been hitherto used as a schoolroom for the sons of the Missionaries; but it was now the holiday season, and many of the lads had gone home to their parents, and that School for the future was to be carried on at the inland Mission Station—Te Waimate. Therefore the press was at once located in this empty room, for the time at least. And though, subsequently, there was much debate, and even decisions arrived at, by the Committee of Missionaries respecting its speedy removal;—1st, to the spacious two-story stone building at the Kerikeri Mission Station, built for a general store for the Church Mission, of which all the facing stones were brought from Sydney;⁴⁷⁴ and, 2nd, to a new building to be forthwith constructed for it at Te Waimate, (of which the framework was subsequently erected, and then blown down in a gale,) yet, nevertheless, it remained in this room, for a few years, and in this room the New Testament (with several other books) was composited and printed.

And here I should also mention the reasons which swayed the Committee of Missionaries respecting the future and fixed location of the Press, these were chiefly three:—1. to be near to the Editor of the New Testament, the Rev. W. Williams, who was soon to remove to the inland station at Te Waimate;—2. to be away from the

474 WC: See Note B, Appendix.

constant interruption pertaining to a Station at the Harbour;—3. to be safe from Maori inroad and pillage; (this last had reference to the types, as Maori Chiefs had passed significant remarks on inspecting them and handling the big quadrats and *Canon* size capital letters; and the Bay tribes were in a very unsettled state, talking of going to war among themselves; this state of things was the main cause for removing the Press to the large and strong stone building at the Kerikeri station).



Paihia from the islet Motuorangi.
The house under the two birds, where the N. T. was printed.

H. B. HERALD LITHO. D. Blair, lith. 1837 W.C.

§ 5. THE PRINTING OF THE FIRST BOOK.

As all parties both European (Missionaries) and Maori were very desirous of seeing something printed, it was arranged, (1) that the Missionaries at Paihia should supply some writing-paper for that purpose from their small private stores: (2) that the *first* sheet from the Press

should be a portion of the New [9] Testament and printed in book form: (3) that as it must necessarily be, under all the circumstances, some small book, it should be the Epistles to the Ephesians and the Philippians, which the Rev. W. Williams (afterwards, Archdeacon, and also Bishop of Waiapu, and one of the founders of this auxiliary branch of the New Zealand Institute,) had lately finished translating into Maori; so, on the 17th of February, 1835, I pulled proofs of the first book printed in New Zealand; the Printing-office being filled with spectators to witness the performance. And on the 21st of the month, twenty-five corrected copies were printed and stitched and cut round for the Missionaries; their wives kindly furnishing a few sheets of pink blotting-paper from their desks wherewith to form coloured paper covers for these tracts; which, of course had first to be pasted on to stronger paper. This little book was in post 8vo., Long-Primer type, and consisted of 16 pages in double columns. For leads I was driven to the miserable substitute of pasting paper together, and drying and cutting it up! not being able to obtain any card or cardboard. My good Joiner (always willing to assist) tried his hand at making reglet, but was obliged to give it up. And not being able to manufacture a roller, from want of the proper materials, I was obliged to do my best with a small make-shift "ball" of my own contriving. I may add, that of this little first pamphlet, 2000 copies were ultimately printed, some folio post writing-paper having been found at the large Central Mission Store at the Kerikeri Station.

**§ 6. REMOVAL OF THE EDITOR AND CHIEF TRANSLATOR
TO TE WAIMATE, A DISTANT MISSION STATION: HIS
SEPARATION FROM THE PRESS.**

Not long after the printing of the first book, in the autumn of that same year, the Rev. W. Williams, his wife and family, removed from Paihia (where they had resided for several years) to Te Waimate Mission Station, inland. At that time there was no resident clergyman at that place, nor nearer than Paihia (a long day's journey); besides he was now stationed there by the Committee of Missionaries, to conduct the large boarding-school of the sons of the Missionaries, which was to be carried on there for the future. I mention this circumstance, as it [10] separated (in distance) the chief Translator and Editor of the New Testament from the Press, which proved to be a great disadvantage, and serious hindrance to the carrying on and early completion of the work. At first, however, it was determined to build a large printing-office at Te Waimate; and in time the framework of the same was erected there;⁴⁷⁵ but as sawn timber was not easily procurable (though in the midst of *kauri* forests), the work was delayed, and eventually it came to nothing.

**§ 7. OF TE WAIMATE STATION, AND THE ROAD
THERETO.**

Here I should briefly mention the geographical position of those two places or Mission Stations. Paihia (as I have

475 WC: It was to be a two-story building, and not long after erection was blown down by a violent storm and never re-erected.

already shown) was on the immediate sea-shore; Te Waimate was about half-way across the island, between the Bay of Islands and the head of the Hokianga river; not very many miles distant (perhaps sixteen) in a direct line from Paihia; but in those days of no roads nor bridges, and scarcely even a Maori track between the two Stations, it was considered a good day's journey (on foot of course,) from the one Station to the other; a portion of the way being circuitous by the sea-shore made the distance to be more than twenty miles. There were also two uninviting places to be crossed; the one at Whauwhauroa, a broad muddy estuary lined by mangroves, unfordable save at low-water or nearly so, and then only by stripping and slowly and cautiously finding one's way with a long pole, wading through deep tidal mud;⁴⁷⁶ and the other the big river Waiaruhe, equally impassable after rains, which also, a little lower down from the ford in its course, forms the Waitangi waterfall. Indeed this, the nearer way, was so very bad, that Mr. Williams, his wife and family, and his goods, all went by the much longer and roundabout one,—across the Bay and up the long Kerikeri river in boats, and thence to Te Waimate by a track over the high open land, —which altogether might occupy three days. [11]

476 WC: Sometimes, but rarely, a visitor or traveller would be taken thither in a boat from Paihia at high water to the landing place on the opposite shore.

§ 8. OF OTHER MATTERS PRINTED IN 1835.

Having obtained a small supply of folio post writing paper from the Mission Store at Kerikeri (all there was!) —1000 copies of the Gospel of St. Luke, 67 pages, post 8vo., were printed and bound during this year. Also, some Proclamations and Circulars for the British Resident, in both English and Maori, respecting the arrival and assumption of the Baron de Thierry and his party; and of the murderous night attempt on the life of the British Resident by a Maori, which, for some time, caused great sensation.⁴⁷⁷ Some hundreds of old Maori books, (of the small 4to. edition printed at Sydney in 1833,) much worn, very dirty and ragged! were also strongly bound.—

§ 9. OF AN INKING-TABLE AND IMPOSING-STONE.

I had found it a difficult matter to get on without an iron Inking-table, but the want of an Imposing-stone was a far more serious one. For the former, I had substituted a small wooden table (14 x 28 in.), the top made out of a broad plank of a hardwood tree that grew on the cliffs near by, (*Pohutukawa* = *Metrosideros tomentosa*;) for the latter I had no other alternative than to use the iron “table” of the Printing-press; this was anything but pleasant, but there was no help for it! On my early rowing up the Kerikeri river, I had noticed the many black basaltic boulder-stones of various sizes, fantastically scattered and piled and even ranged in natural rows in many places; and I thought that one of

477 WC: See Note C, Appendix.

them might be made to serve and do good service if it could be cut. This was eventually done by Mr. Edmonds, (a Catechist of the Church Missionary Society, residing at the Kerikeri Station, who, at Home, in England, was a stonemason by trade,) although when a fitting size block was found at last, and conveyed to the Station, it took him a long time to cut it into two parts (after having been trimmed and squared) through the stone itself being so excessively hard, and his not having any proper appliances for the purpose. And when cut and their surfaces smoothed they were found to possess several scattered vesicular cells, which had to be filled up with cement. Still, they were a useful pair of stones, and when, at last! (in March, 1837,) I got them brought down in our little Mission [12] Cutter (Te Karere) from the Kerikeri Station, and also got them mounted on frame with drawers, made at Kororareka (now Russell) by my joiner, I felt happy and thought I was rich! This is the first, perhaps the only, instance, of a pair of large Imposing-stones made out of a boulder of basalt, and therefore I relate it, I often heard the remark, that the cutting alone of those two stones cost the Church Missionary Society, on the lowest calculation, considerably more than £20; of course they were both from one block sawn asunder, and roughly squared and trimmed on their outsides, and very thick!—

§ 10. PRINTING THE FIRST ENGLISH BOOK AND PLACARD.

On May 19th, 1836, the first English book was printed at the New Zealand Mission Press; a small unpretentious

book of eight pages, post 8vo., containing the first "Report of the New Zealand Temperance Society." Placards also in English, and the first ever printed in New Zealand, calling a Public Meeting to establish the said Society, were printed and circulated the month before.—

§ 11. THE COMMENCEMENT OF PRINTING THE NEW TESTAMENT.

(“Opus manuum nostrarum dirige.”)⁴⁷⁸

We had heard of the arrival at Sydney of our long-looked for supplies of paper and printing materials from England; therefore, on the 23rd of March, 1836, (having recently received a few sheets of first “copy” from the Editor,)⁴⁷⁹ I commenced compositing the New Testament. It was long, however, before we received those necessary supplies from Sydney; so that I did not commence printing the Testament until the 23rd of June, —and then *alone*, without any assistant! (a memorable day and time with me!) It had been already decided by the Committee of Missionaries, that the New Testament should be of demy 8vo. size, and in Small-Pica letter, and should consist of 5000 copies: (4000 had been at first fixed on, but at the very earnest request of the Wesleyan Missionaries, 1000 additional copies for them was added thereto.) Finding I was advancing very slowly, and the work long and heavy, I engaged three steady Christian

478 “Direct the work of our hands.”

479 WC: His kind note which came with them is so characteristic of him, that I am tempted to make an extract from it.—See Note D, Appendix.

[13] Maoris, (adult and tattooed chiefs from Te Kawakawa,) Andrew, Joseph, and Hamo, to work as pressmen. But while, at first, willing to learn and to work (*in their way*), they caused me so much trouble and anxiety, and also loss, (besides their getting to dislike the work, as being wholly unsuitable to their habits, there was so much standing, and that too in one place,) that I was obliged to dismiss them and to do without them, and go on, as before, *alone!* The youthful Maoris of that day would not work at all, and could not be trusted. Indeed I had tried some sharp intelligent Maori youths (sons of neighbouring and friendly chiefs) during the past year to roll the forms, while engaged in printing the gospel of St. Luke, and some other smaller works; but they soon got tired and left me, just as they were severally becoming useful; this was in a great measure owing to their being obliged to stand so long in one spot at their work.⁴⁸⁰ As a bit of curiosity I may mention, that the wages I paid to those three men, as agreed upon between us, was 3s. each per week, and their food,—this latter mainly consisting of potatoes and other edible roots of Maori cultivating. Three were engaged, as while two (in turn) worked at Press, the third did the simple cooking, getting water, shell-fish and firewood.—

“All service ranks the same with God—
With God, whose puppets, best and worst,
Are we: there is no last or first.”—

Browning.

480 WC: See Note E, Appendix.

§ 12. OF THE PECULIAR HINDRANCES TO THE PROGRESS OF THE WORK.

Here, I think, I should briefly mention the hindrances or obstacles in the way of carrying on this important work; for unless I do so, such would not be known, nor even guessed at. These were many, and may be classed under three main heads; viz. (1) on the side of the Editor: (2) on the side of the Press and Printer: (3) Sundry.

I. *Those on the side of the Editor, were:*—(1) His own heavy and constant daily public duties, besides those appertaining to his own growing family, arising from his being the only Clergyman at that Station, and indeed in the whole North inland District, extending from Mangakahia on the South to Kaitaia [14] the most Northern Station: (2) from his being the Master and the only Teacher in the Mission Boarding-school for boys: (3) from his being the only resident Doctor and Surgeon in those parts: and (4) from his residing so far away from the Press, with which he could only have distant, precarious and irregular communication,—scarcely on the average of once a fortnight; and then only by special messenger, and not unfrequently at some risk.—

II. *Those on the side of the Printer and the Press.*—These were also manifold, heavy and unceasing. For, in addition to those of his own separate department of the Printing-office and Binding room, (in two houses far apart,)—all of which had to be performed by him alone; there were the common daily public duties of the Mission Station, of which he had to bear his share. The rule of the station was, that out of the three resident Missionaries, comprising the Rev. H. Williams and Messrs C. Baker

and W. Colenso, one was always to remain at the Station; this was absolutely necessary on account, of visitors, both Maori and settlers in the Bay, and also foreigners from ships at anchor; and my own particular duty in the Printing-office confining me at the Station during week-days, a larger share of the home or Station duties frequently devolved on me. Besides I alone had the charge of the Surgery, the attending to patients, and the making-up and issuing of Medicines; occasionally informing Rev. W. Williams of severe and peculiar cases for my guidance. My daily week-day duty commenced with early morning Maori prayers in the chapel, and adult male school in the open air in its grounds when fine, when showery in the chapel, and the keeping the roll and books of the School; that over, to return to my house and prepare and get my breakfast, and then to the Printing-office or Binding-room according to what work might be in hand. Then there was the warehousing work, (viz. the receiving of paper and other printing stores, the packing and sending off of books &c., to the different Mission Stations,) also the keeping of the accounts of the Printing-office, both for receipt and expenditure of material and money, including periodical returns both for the Committee of Missionaries in New Zealand and for the Parent Society; and not unfrequently the tiresome jobs of bartering with the Maoris, for potatoes and other edible roots, maize, pigs, fish &c., &c, which necessarily took up a great [15] deal of time, so much of it being *new* to me! and the Maoris utterly regardless of the value or the waste of time; and also twice a week attending to the delivery of rations, and many other necessary and common things in daily use: the “rations” included the

cutting-up and weighing out of pigs (pork), weighing out of potatoes, flour, rice, &c., &c., for the Mission families and the inmates of the European Girls' Boarding-school (approaching 50 persons),⁴⁸¹ also for all the Maori domestics and workmen of the Station, in number about another 50. This work, however, for some time, was mainly undertaken by Mr. Baker when at home and well, before that he removed to Waikare Station. Of course there was also the cooking to be attended to,—another heavy item with me, as it included the making of bread; (no Bakers, nor Butchers either, then in the land!) this was mostly done by me on Saturday afternoons. The having to go to-and-fro so very often daily, from my dwelling-house to the Printing-office, situate far apart, was another item causing great loss of time,—to say the least of it. Then, at night, was the learning the language, (&c, &c, mainly, if not only, to be obtained from oral intercourse with the Maoris.

Sundays, also, were my heavy days of work; on these there was no rest for me. Indeed my duties on Sundays were generally heavier than on weekdays; whether it was my turn to remain at the Station—to hold Divine Services there, or to go out to the Maori villages to do so. *If at the Station*,—then there were invariably (weather permitting) four or five Church-of-England services; four at the Mission Station, viz. two in Maori, early morning and evening, and two in English at 11 a.m. and 3 p.m., which several of the more respectable English settlers residing on the opposite shore of the Bay, together with the

481 WC: Both of the two senior resident Missionaries had very large families, nearly one dozen of children in each.

British Resident (Mr James Busby) his lady and family usually attended weather permitting, and frequently captains or officers and a few men from ships; and, also, at 2 p. m., at Kororareka (now Russell) on the opposite shore of the harbour, to which place we always went in our boats, the only mode of communication; usually the Missionary who had taken the two morning services at the Station had to cross over to Kororareka and take the two afternoon Services there, (one in English and one in Maori,) [16] besides visiting the sick Maoris, &c, and then late in the evening take the Station Maori Service on his return, (this last often performed in excessive weariness!) *If away from the Station*,—at Kawakawa, or at Waikare, (or at some of the other Maori villages on the shores of the Bay,) then in order to get there in time and with the tide, (always some hours pull or sail,) I often had to leave the Mission Station by sunrise or earlier, and return at 8 or 9 p. m., hungry and completely worn out! and that partly through travelling some miles over hilly country on foot, after landing from my boat, to get to the Maoris at their several villages: sometimes, when wind or tide or both against us, I have not been able to get back to the Station till midnight, or early morning, after pulling perhaps six or seven hours!—I ought not to omit to mention the good praiseworthy conduct of my young Maori rowers, &c, *at such times* of trial; but in order to obtain it, or to keep it up, one must ever be in a good humour! at such seasons not always an easy matter.

III. *Sundry*:—To those already mentioned must also be added certain abrupt obstacles of another kind, often of a very serious nature, which could neither be foreseen or provided for; as, for instance:—

1. The state of the weather; for if wet, (heavy rain which sometimes lasted two or three days,) especially in winter,—the young Maori messenger could not well perform the journey on foot, whether to or from Te Waimate; besides we all knew, from sad experience, that the Maoris were careless and prone to sleep in their wet clothing, especially when tired and in a strange place, which frequently ended in consumption. And just so it was for a few days after heavy rain, as the big river Waiaruhe would then be flooded and impassable at the only landing-place, its current too, at such times being very strong: Europeans have been drowned there.⁴⁸²
2. The dislike Maoris always had to travel alone to any distance. This was a national feeling and not to be wondered at nor trifled with. At the same time they frequently paddled singly in their small canoes many miles up and down the rivers and estuaries of the Bay, when they could see around them for some distance and so be free from surprises. We generally had [17] a pretty large number of Maoris dwelling with us at the Mission Station, but most of them (sometimes all) had come thither from other and distant tribes to be taught in our schools; and these strangers could not be sent on any such journeys, over the lands &c, of other tribes, who might have been their deadly enemies in the past, or have some grudge still unavenged; neither could they have been induced to go.
3. The uncertain capriciousness of the Maoris (in those days), rarely ever to be depended on for coming at the

482 WC: See Note F, Appendix.

time appointed; the one engaged as a messenger being continually liable to be called away, or to turn aside, or to loiter, and be almost sure, after he had arrived at the place to which he was sent, and delivered his packet, to want to rest for a few days, or to visit some relative or clansman in the neighbourhood, where he would while away two or three days or more; indeed, to do so, would often be the real ground of his going as a messenger.

4. The interruption occasioned by travelling or voyaging parties of Maoris coming peacefully or otherwise to the Station, and which for the time upset, or put a stop to, all regular occupation;⁴⁸³ not unfrequently causing the Missionaries and their Maori residents and domestics to be on the *qui vive!* Here, also, must be placed the interruptions caused by unexpected European visitors,—as by the Captains and officers of Ships of war; the last visit to the Station and New Zealand of the Rev. S. Marsden and his suite, &c, &c.⁴⁸⁴

5. Also, in stormy weather, the hauling up of all our boats and canoes on to the high bank above the sea-beach as a place of safety; and, again, the saving of the few head of cattle belonging to the Station from being lost in the neighbouring swamps, into which they sometimes ventured in quest of food, and could not extricate themselves.

6. And lastly, during the year 1837, great and serious and long-continued hindrances arose, owing to the Ngapuhi tribes in the Bay of Islands fighting among themselves;

483 WC: See Note G, Appendix.

484 WC: See Note H.

this was their last battle—or series of battles, for it continued several months, during which many on both sides were killed and wounded.⁴⁸⁵ Of course this sad unsettled hostile state of things proved to be a great hindrance to any communication by a single Maori messenger between the two Mission Stations. [18]

§13. THE PRINTING OF THE NEW TESTAMENT—continued.

To return: My three Maori neophyte pressmen having left me, and of course taken back with them to their *pa* (village) and people a full and particular account of the many disagreeables inseparable from this new and wonderful art of printing there was no longer any hope of fresh Maoris in their place (nor did I wish to have any more,) so on their leaving me in August, I was obliged to carry on my heavy work *alone*, and that very slowly; what served to make it worse, and to embitter it, were my many interruptions and extra burdens,—not a few of which might have been lessened if not avoided: (my feelings at that critical period I will not attempt to give). —Thus it continued till the middle of November, when I accidentally fell in with two young pressmen on board of an American whale ship, and as they were desirous of leaving their ship I engaged them; their names were Henry Mann and John Bevan; and as these men had worked as pressmen in America I record their names as my first trained helpers in the work of the printing the New Testament. Unfortunately, however, they only

485 WC: See Note I.

remained with me until near the end of January, 1837, (just nine weeks,) when they left. No doubt the isolation and quiet of the Mission Station, and the great difficulty of their getting any needful supplies, (save the common rations already mentioned,) had much to do with their leaving me; they were quiet industrious men. I may also mention, that their wages were, each 5/- per day, and they worked 5½ days a week. This latter their own choice, as they spent the Saturday afternoon attending to their own private matters; also in going across the harbour, when fine, in one of my boats, to the Storekeepers on the opposite side, about three miles distant, to purchase stores.

Here I should state, that the American whale ships (which at that period came frequently into the Bay of Islands to obtain supplies) were always manned with a very different class of men to those of our English ships. The crew of the American ships were not usually trained sailors, but young workmen of almost all trades; men who, tired of their occupation, or desirous of seeing the world, or of going on a voyage of adventure and sport, engaged on board of those ships; yet they generally worked well together there, and seemed happy;—I had several [19] opportunities of observing them in my visiting those ships, where I sometimes partook of their free and kind hospitality. Once more, being left, I carried on *alone*; and this continued about a month; when, on 23rd February, I again met with two more American pressmen on board of one of the American whalers at anchor in the Bay, and they being willing I engaged them. Their names were James Powell and Charles Upham; the former remained with me scarcely five

months, leaving in July; but the latter remained until the printing of the New Testament was completed, in December, 1837. —They were both very quiet industrious steady men; it was even a rare thing to hear them talk! Upham in particular was a very peculiar man, a thorough American, even to the chewing of tobacco! and a good quiet steady hard-working fellow; excessively quaint in his few remarks made at intervals. The wages I paid these two men were, at first, the same as to the two former pressmen, 5/- per day; but after a short time, at their own request, their pay was altered to 25 cents, or 1/- each per "token," (10 quires = $\frac{1}{2}$ -ream,) besides which, as they could not be always at press-work, they were paid 12 cents, or 6d per hour for other work connected with the Printing-office and Binding-room, and Warehouse,—as, in drying, and pressing, and folding the sheets, &c.; but would never do anything in the way of distributing type, and even if a letter should be drawn out, or be broken in their working-off the forms, (which sometimes though rarely did happen,) they would not, or more properly could not well, replace it; and spoiled paper (if any) they had to pay for,—which, however, did not amount to much. Upham worked alone at Press for a period of six months, after his companion left, (always a disagreeable and slow process for *one* person,) and, of course, from that time he was paid 2/- per "token." He was a very good and trusty pressman, and kept the "colour" well up, and his rollers, &c, in nice working order. During the whole of the time they continued with me they never once got into altercation or trouble with the Maoris.—

§ 14. COMPLETION OF PRINTING THE NEW TESTAMENT.

The printing of the New Testament, consisting of 356 pages, being at last accomplished by the middle of December, 1837,—a [20] cause of great rejoicing with me! (and also many others who were in eager expectation of receiving a copy;)—the next step was to get the books bound. By dint of steady persevering labour I was enabled to finish binding a few copies in calf on the 30th December, for distribution to the Missionaries on the approaching 1st January, 1838, as a New Year's Gift; which was heartily welcomed with many thanks and correspondingly valued by them. Now the demand for copies became great beyond expression, from all parts of New Zealand where the Missionaries were known, or to which Christianity had extended; finding it impossible for only myself—unassisted—to get them bound fast enough, (and there were plenty of other useful and needful works awaiting publication,) the Committee of Missionaries met, and I was instructed to send a quantity to Sydney, in lots of 500 at a time, to be bound there; having first arranged with a Sydney firm as to price, &c. These were all bound in cloth, but were not so strongly and carefully bound as those which I also bound in linen cloth at Paihia. And as it was well-known, that the Maoris valued more highly an article they had paid for, than one given to them, it was also decided that the book should be sold, and the price fixed for it was 4/-,—a rather large sum in those days for the Maoris to raise, (as they received but a very low price for all their articles of barter, which, as a matter of course, was very rarely ever paid in coin,) at the same time many copies were given away. The 1000 copies in sheets were soon handed over,

as promised, to the Wesleyan Missionaries residing at Hokianga, who sent them to England to be bound.

**§ 15. NOTICE OF SOME PLEASING OCCURRENCES,
SHOWING THE HIGH VALUE SET BY THE MAORIS ON THE
BOOK.**

Many remarkable incidents happened at this time, showing the extreme value placed by the Christian and well-disposed Maori Chiefs on the Sacred Volume; all of them would prove highly interesting; one or two I will briefly mention. The powerful Chief of Kaitaia, (near Ahipara and the North Cape,) Panakareao, (afterwards Baptized and named Nopera = Noble,) wrote me a letter for a single copy; and in order that it should arrive the more dignified, he sent it all the way by a special messenger, (a long journey of several days through a wild and [21] little-known dense untravelled forest,) and with it he sent me £1 in gold for payment, strictly limiting his request to *one* copy only! It was *the first* sovereign I ever saw with a Maori, or in this Country, (indeed, silver coin also was very scarce, rarely seen or used,)⁴⁸⁶ and the letter and the gold were well-secured being wrapped-up in folds of cloth, and bound and worn turban-fashion night and day on his head. And as not many of the principal Maori Chiefs or their sons could then write, many of them travelled on foot and barefooted to Paihia, from very great distances, to obtain a copy; at the same time running no small risks in their doing so, owing to the unsettled unavenged old feuds which still existed. Several distinguished early foreign

486 WC: Note J, Appendix.

visitors also got single copies by asking,—as the Bishop of Australia, Admiral du Petit Thouars of the French Navy, Capts. P.P. King, and Harding of the British Navy, Commodore Wilkes of the American Exploring Expedition, &c, &c.—In line, and in spite of the utmost care, the whole edition went away so fast, that a new edition of 5000 copies, in 12mo., was speedily printed in England by the British and Foreign Bible Society.

§ 16. FOREIGN CONGRATULATIONS ON THE SUCCESSFUL PERFORMANCE OF THE WORK: THIS EDITION OF THE NEW TESTAMENT THE *FIRST* PUBLISHED IN THE SOUTHERN HEMISPHERE.

Among the number of kind congratulatory letters I received from many and distinct quarters abroad, on the finishing of the New Testament, I may be allowed to give an extract from a high official one written by the Clerical Secretary of the Church Missionary Society, the Rev. William Jowett,—a good man! his letter is truly *sui generis* and highly characteristic of the writer.—

“Church Missionary House, London,
December 17th, 1838.

“Dear Mr. Colenso,

... “I desire to turn your thoughts to the peculiarly useful (and therefore honourable) department which you *do* occupy. The sight of that New Testament in the Native language, which you have been privileged to carry through the Press, is such a sight as fills my heart with indescribable joy. Think now to what great ends it is capable of becoming instrumental. Preachers will preach

from it: Families will conduct [22] family-worship by it: Conversations innumerable will be held upon it: it will help private self-examination: it will help those who conduct examinations of the professing Native Christians: it will be for private meditation and prayer: it is the Standard of Wisdom of every kind: it comes in most seasonably with a flood of light to resist the invading darkness of" (the time): "it will, moreover, help the fixing of the language; and school-books, and many other books, will grow out of it. No doubt the Spirit of God will use this sword!

"Then it may be well to consider, that *we* are *only* instrumental in this matter. *We* did not make the Book; Divine Inspiration gave it. You did not translate it; others did that. But you were at hand with the *art*—hidden for ages—by which this great and simple work, this *unmiraculous miracle*, was produced.

"There is on every side cause to be thankful and humble. The Lord make you and me to be so, and that habitually! I have often heard persons of the highest talent say, that they would gladly be hewers of wood and drawers of water in this cause. One had better not say too much for one's self,—but I could almost fancy that were I a Christian Nobleman, and had the choosing of a humble but most useful office in the Missionary field, it should be that of a Printer, to print the Holy Scriptures and Religious Tracts. Now this office *you* have: Bless the Lord for it, and serve Him in it!

"I remain, Yours most truly,
(signed) "WILLIAM JOWETT."
"Mr. Colenso."

From the date of this letter may be well-inferred the length of time it took for a letter, &c, to go Home and to be, answered, (as alluded to by me in § 3.) I had sent bound copies of the New Testament by first direct ship in April, 1838.—It was known that those whale-ships always sought for whales on their way Home, and so made long voyages. It will, also, be seen, that Mr. Jowett wrote thus fully and kindly to cheer and encourage me in my work; having known from my daily journal (which we were all bound to keep and forward regularly to the Society,) how I had been situated. I have given a longer extract from his letter than I had intended, to record his Christian hope and belief of the, great and manifold benefits to be derived from the printing of the New Testament in the Maori language, (in which he was also joined by all the Members of the Church Missionary Society;) as well as to show his valuable opinion of the Press and its introduction into this Country; he too being an author of several works. [23]

And here, perhaps, I may also mention, the little-known but astonishing fact, that this edition of the New Testament in the language of New Zealand was *the first* publication of the Sacred Volume entire in the. Southern Hemisphere!

— “Sail on, O Ship of Life,—
In spite of false lights on the shore,
Sail on, nor fear to breast the sea!
Our hearts, our hopes are all with thee,
Our hearts, our hopes, our prayers, our tears,

Our faith triumphant o'er our fears,
Are all with thee,—are all with thee!"

—Longfellow: "*The Building of the Ship*" (slightly altered).

§ 17. OUR HOLIDAY ON THE COMPLETION OF THE NEW TESTAMENT.

The Committee of Missionaries very kindly granted us two (the Editor and the Printer of the New Testament) a holiday,—or relief from heavy and constant daily duties which had long been pressing on us both; it being also the time of the Christmas vacation with his School. And with the New Year, (1838,) we were directed to visit the Natives at the East Cape and Coast on to Poverty Bay, (then an almost unknown district,)—so we left the Bay of Islands on our voyage thither, on the 1st January, and returned on the 13th February following.—Our journey of several weeks among those hitherto unknown parts and people was a very interesting one, highly romantic in not a few instances;⁴⁸⁷ one benefit to the Press resulting therefrom I may here briefly mention, viz.,—that out of the nine youths I brought away with me from the East Coast for instruction, two of them I succeeded in training to become fairly good and useful pressmen in the following year, 1839.

487 WC: See Note K, Appendix.

**§ 18. A FEW REMARKS ON THE NEW ZEALAND
LANGUAGE, AND THE CHARACTERS OR ALPHABET USED
IN THIS EDITION OF THE NEW TESTAMENT.**

When Professor Lee of Cambridge in 1820, supervised and methodically arranged the MSS. of the New Zealand language,—that “had for the most part been previously collected by Mr. Kendall, who had for several years resided as a settler in New Zealand under the auspices of the Church Missionary Society; and who, on his return to England, took two Native [24] Chiefs with him, Hongi and Waikato;”⁴⁸⁸ Professor Lee (or Mr Kendall) gave the five vowels (still retained and in common use) and twenty consonants; so making the New Zealand Alphabet to consist of 25 letters or characters,—much the same in fact as the old and common English one, with the sole exception of the letter *C*; and yet one essential sound or character was not provided for. In course of time, however, this long alphabet was found to be not required; and no less than eleven consonants were discarded,⁴⁸⁹ and the alphabet correspondingly simplified.

On my leaving London in 1834, for my sphere of labour in New Zealand, I applied at the Church Missionary House for a copy of Lee’s “Grammar and Vocabulary,” published by them; and I was informed that I had better not study one on my way out as it was in many places incorrect; so I came away without a copy. On arriving in New Zealand, I found the language had been lately

488 WC: See Preface, Lee’s “*Grammar and Vocabulary of the Language of New Zealand,*” page 1

489 WC: These discarded consonants were B, D, F, G, J, L, S, V, X, Y, Z.

settled by the resident Missionaries; (as, also, recently used by them in some portions of Holy Scripture, prayers, and hymns, that were printed at Sydney for the Mission in 1833;) and this orthography was further adopted in the printing of the New Testament, and other early books and papers.

Still, there were grave objections to the combination of the two English consonants *n* and *g*, to represent the nasal sound, or *ng*, (as given by Kendall and Lee,) such being complex and unwieldy, when a new and much more simple character (say half of the *n* and half of the *g*) would serve, and in writing be more quickly made; this objection, however, was overruled, on its being shown, that some of the New Zealand tribes, particularly the Ngatiawa, only used the *n*, dropping the *g* sound altogether.

I was not very long in the Country before I discerned, that one more character or letter, was absolutely necessary to make the New Zealand alphabet perfect; this was early made very apparent to me while conducting the adult Maori school, as I saw from the want of it the Maoris themselves often made both ludicrous and grave mistakes in their reading in class the Sydney printed books; where the consonant *w* was made to stand and do duty both for its own simple sound of *w*, and for the more complex one of *wh*. [25]

In course of time I wrote a long letter on the subject to the Committee of Missionaries, showing the need of the wanting character being supplied, and also how it might better be formed, from several printed examples in large and small letters, as, *w'*, *wh*, *f*, and *v*. To my letter an

official reply came from the Secretary, informing me, that the Committee of Missionaries did not see the necessity of any alteration or addition to the Maori alphabet.⁴⁹⁰

And so the New Testament was printed according to the then established orthography.

Notwithstanding, my expressed opinion grew, and was supported by several, and among others by the Wesleyan Missionaries on the West Coast, who adopted the *wh* to represent the sound not already provided for. I had certainly preferred the more simple form of *v*, (so easily written,) which, together with *f*, had been also used by some of the Missionaries in the South Sea Islands to represent that common Polynesian sound. Subsequently, the Rev. W. Williams, and the Rev. R. Maunsell, agreed with me in this.

In 1842, the Bishop of New Zealand, Dr. Selwyn, arrived in New Zealand, accompanied by his Chaplain, Rev. W.C. Cotton and others; and in the following year (1843), a Printer having arrived at Paihia from the Society in England to take charge of the Mission Press, I went to reside with them at St. John's College, Te Waimate. They had seen the letter I had previously written to the Committee of Missionaries, and agreed with it; and as the Bishop had a very small printing-press and type of his own, at which small notices, bills, leaflets, and single pages, were frequently printed in Maori, (though not by me,) Mr. Cotton adopted the *w* with an apostrophe (thus, 'w,) to indicate the wanting

490 WC: See Note L, Appendix.

character for that particular sound, and a type was struck at Home at Mr Cotton's expense, to represent it, and in course of time used there at the Bishop's press. For my part, however, I never cordially approved of it, as it was not so simple as the *v*, and not quickly written, the accent-like apostrophe might be easily broken off, and it was opposed to all established Polynesian alphabets. In subsequent years that new character was abandoned and the *wh* adopted, which has long ago become general and fixed, as we now have it. [26]

In concluding this section of my paper on the orthography of the Maori language, I would give an extract or two from Cook, and also from Forster,—the talented German *savant* who accompanied him on his second voyage to the South Seas, and who did so much under great difficulties. The marvel with me has ever been that Cook and his party on the whole managed so well as they did, which must mainly be attributed to their having the Tahitian native Tupaea with them as *quasi* interpreter. Capt. Cook says, in his genuine racy way:—

“It is the genius of the New Zealand language to put some article before a noun, as we do *the* or *a*; the articles used here were generally *he* or *ko*: it is also common here to add the word *oeia* after another word, as an iteration, especially if it is an answer to a question; as we say, yes indeed; to be sure; really; certainly: this sometimes led our gentlemen into the formation of words of an enormous length, judging by the ear only, without being able to refer each sound to its signification. An example will make this perfectly understood:—In the Bay of Islands is a remarkable one, called by the natives

Matuaro. One of our gentlemen having asked a native the name of it, he answered, with the particle, *Komatuaro*; the gentleman hearing the sound imperfectly, repeated his question, and the Indian repeating his answer, added *oeia*, which made the word *Komatuarooeia*; and thus it happened that in the logbook I found *Matuaro* transformed into *Cumettiwarrovia*: and the same transformation, by the same means, might happen to an English word." [Of which he gives examples.]—*Voyages*, vol. iii, p. 476 (original 4to. edition).

Unfortunately, however, similar errors still continue here among us! notwithstanding their settled, plain, written, and printed tongue.—

I have often been struck, some 40-45 years ago with the close phonetic rendering of many Maori names of Birds, Fishes, &c, by the two Forsters (father and son), and with the large amount of patient toil they must have experienced in taking them down; albeit their orthography, at first sight, abounding in harsh double consonants, looks very barbarous, and is anything but tempting: also, with those of Lesson and other Naturalists belonging to the French Discovery Expeditions of 50-60 years ago. Of course their orthography varies much from the far simpler one adopted in rendering the Maori tongue into writing; still it is such that I could have beneficially used in my early enquiries among the Maoris, which is more than can [27] be said of many (so-called) Maori names more recently written and published too in this country! A few of those old Maori names of Birds I will give here from Forster, as a curiosity. It will be seen that he, in many instances, adds the indefinite

article (*he* = a) to the name of the Bird, and uses *g* and *gh*, hard for *k*:—⁴⁹¹

English Name. Maori Name. Maori Name from Forster.

Sparrow-hawk.....Karearea.....Kari-area.

OwlRuruHerooroo.

KingfisherKotare.....Ghotarre.

Parson-bird.....TuiiToi.

Bell-birdKoparaHeghobarra.

Thrush.....KoropioGolobieo.

Fantail Flycatcher ...Piwakawaka Diggowaghwagh:
(Piouakouaka, *Less.*)

RobinToitoiGhatoitai.

Pigeon.....Kereru.....Hagarreroo.

PloverTuturuwatu.....Doodooroo-attoo

Blue Heron.....Matuku Matook:
(Matoucou, *Less.*)

Paradise Duck.....Putangitangi .. Pooaduggieduggie.

DuckParera.....He-Parerra.

§ 19. OF PAY AND RATIONS, VIZ., MONEY AND FOOD.

I have in this paper said a little about pay (to Maoris and American pressmen) and rations; perhaps I had better say a little more on these subjects; as, at the present day, they must appear somewhat antiquated, and my further information may serve to amuse if not interest you.

491 Forster learned his Māori in the South Island, where Ngai Tahu used the hard “*g*” when northern Māori would use a “*k*”.

I. *Of Pay:* Money (coin) was not then in use in dealing with the Maoris, (nor indeed in dealing with whites, who were paid in Orders, which they parted with at the Stores.) With the Maoris, whether for wages or for articles brought for sale,—as pigs, fish, peaches, melons, pumpkins, potatoes, maize, *kumara* (sweet potatoes,) &c., it was invariably a matter of barter.—Sometimes, two, three, or four canoe-loads, belonging to different parties, landed and stacked on the beach, were purchased and settled for in an hour or less; at other times the purchase of a single pig brought for sale might occupy (if allowed) half a day. The Mission goods sent out for that purpose were always good useful durable articles, whether iron ware,—as axes, spades, iron pots, knives, &c., or soft goods,—as blankets, prints, calico, [28] shirts, trousers, caps, &c.; and as these English goods were well appreciated by the Maoris, we generally had plenty of enquirers or barterers, whenever they had produce for sale. A large and constant supply of pigs and potatoes was required by the Station. Sometimes, however, we knew what it was to want—for a season, especially in times of drought and scarcity; but the shell-fish (principally cockles) in the adjoining sea-banks, were always available and prized. At such times we had to purchase Rice and Biscuit from the Stores in the Bay for vegetable rations to our Maoris, and sometimes obtained a large lot of Yams, brought for sale from the Islands further North, for the same purpose. Pork was the only Butchers' meat known to us for many years,—the flesh of wild, or Bush pigs, and very good it was. We had also some fowls and eggs, and fish, too, occasionally, but not a full supply. Milk and butter were not to be had (by

me) for many years after my arrival. The sum of 3/- per week (with simple rations) to each of my three Maori pressmen, must *now* seem ridiculously small, but it was not so considered then; indeed, it was the highest rate known. At that time, useful foreign articles of common use among the Maoris were cheap, and they, in their frugal simple way of living, did not need many; and tobacco was under 6d per lb., and not yet in common use.—

Some, perhaps, may wish to have their curiosity satisfied as to my own pay, or salary; for several years this was £30 per annum, (fixed by the Home Committee, and to commence on my arrival in New Zealand,) with rations, and a “*whare*” (small house) provided, but no furniture. I did not know anything about either pay or rations until I arrived in New Zealand; I had never enquired in England; I never cared to do so.

II. *Of Rations*:—The rations furnished us, consisted of five principal foreign articles, viz. Flour, tea, sugar, salt, and soap, and whale-oil and ball-cotton wick for a small (shilling) japanned hand-lamp; and also two Maori articles of food—potatoes and pork. The weekly allowance of foreign rations was very small, and generally served-out every half-year; it was said to have been the same in quantity as the convicts’ allowance in Sydney; a single ration not being sufficient for one person (as in my own case), but a number coming together—as in a large family where all received rations, did better. I have still an official [29] note of January, 1836, from the Secretary Committee of Missionaries, informing me, (in reply to my note respecting the

smallness of the rations issued,) that my future “ration of sugar was increased from 1 lb. to 1½ lb., and of tea from 2 oz. to 3 oz. per week;” the sugar served out was only the soft brown kind, and not unfrequently obtained from Tahiti. Some, or most of those rations were charged high,⁴⁹² *i.e.*, in one’s wanting any quantity *beyond* what was allowed;—this was done, not to make any profit, but to meet heavy extra expenses and loss. Flour, for instance, when made from wheat grown on the Society’s farm at Te Waimate was nearly double the price of the same article when imported from Sydney for the use of the Mission; and we were, in a measure, obliged to take it! The extra price for Flour from the Church Mission Farm, arose in part from the fact, of it being carted thence to Kerikeri across a rough country and no roads, there to be stored, and from Kerikeri to Paihia by boat or small vessel; all which additional charges for land and water carriage were added to that of growing and grinding the wheat.

§ 20. CONCLUSION.

Having thus briefly and somewhat disjointedly brought together and placed before you a truthful relation of matters pertaining to the Introduction of the noble art of Printing into New Zealand—the future “Britain of the South,”—I cannot lay down my pen without making a few final observations.—

492 WC: I quote from an official memo., sent to me:— “Flour, 6d per lb.; Tea, 8/- do.; Soap, 9d. do.; Sugar, 6d. do.; Pork (fresh), 3d. do., and (salt) 4d. do.”

1. It seemed almost natural,—in this year of universally observed “Jubilee”!—that I, having been so long and closely connected with the “Divine Art,” and having also survived the many who were my early co-workers in this Land fifty years ago!—that I should be desirous of placing on record at this period what I knew concerning the Press,—its birth and early yet slow growth, under many peculiar hardships and difficulties; which, however, have long ceased to exist; and which, were they not recorded, could never be conjectured. And all this, I fancy, will be more truly and fully appreciated a hundred years hence, than it can possibly be now. [30]

2. I have often looked back with much pleasure to the period of my long connection with the Church Mission and *first* Press in New Zealand; and at the quality the usefulness and the amount of the work issued from it. Notwithstanding it was a time of heavy labours and of much anxiety. The Press rightly used is a mighty power for good, none greater; but it is too often used in the opposite direction; and then, alas! the truthfulness of the old adage is again clearly shown and seen,—“*corruptio optimi pessima.*”⁴⁹³—

3. In my coming to reside in Hawke’s Bay in 1844, I brought hither with me a small Albion Press and types, which I again found to be of great service; though, having a people scattered over a very large district to attend to, with its consequent heavy travelling on foot, there being then no roads, I could not use my little press so much as I wished.

493 The corruption of the best is the worst of all.

4. Happily there is no need for any one at the present day to attempt a panegyric on the Art of Printing, or the diffusion of light and knowledge through the Press; one might just as well vainly venture

“To gild refined gold, to paint the lily,
To throw a perfume on the violet,
Or add another hue unto the rainbow.”—

Yet, the words of an eminent Printer of the beginning of this century, may, I think, be here aptly quoted, in connection with the advent of Printing into this (then) dark Land; (words used by him in vividly portraying the contrast between what existed in the dys of the dark ages and the great and sudden change that attended the invention of the Art of Printing;)—

— “No sooner did this bright luminary [the Press] burst upon Europe than its brilliant rays, like the meridian sun, not only enlightened and invigorated mankind, but also dispelled the murky clouds which had for ages cemented the bands of Ignorance and Superstition.” And again:— “For our own parts, we never think of the benefits conferred on mankind by this Art, but we feel our bosoms swell with admiration of the Divine Being for this inestimable blessing.”

— Johnson: “*Typo-graphia,*”
vol. I, preface, pp. i and xii.

And heartily supporting those truthful noble words and sentiments, with them I close my Paper.

P.S. Printed hooks and papers, letters, locality map, sketches illustrative, accounts, &c., mentioned, or alluded

to in this Paper, were all exhibited at the meeting of the Hawke's Bay Philosophical Institute. [31]

APPENDIX.

Note A, page 7.

Having mentioned my printing for the Colonial Government on the formation of the Colony, I may here briefly relate a few circumstances in connexion with the same. My work began in January, 1840,—immediately on the arrival of H.M.S. "Herald," Capt. Nias, bringing Capt. Hobson, R.N., our first Governor,—and continued at intervals throughout that year. During the time it lasted my life was truly a heavy one—doubly laborious! and though in good health and strong and willing I was well-nigh worn-out, and obliged at last to inform the Government, (officially through the Committee of Missionaries,) that I could not do any more public printing for them; as much of our Mission printing was sadly in arrear, &c. During that year the new Governor resided at Okiato, (about three miles up the inner S.E. arm of the harbour from Paihia, and on the opposite shore,) where, also were the Government offices; but many of their chief officers dwelt in different places on the neighbouring shores of the Bay where they could find suitable residence. A curious circumstance occurred in the printing of one of the Proclamations of the Government, viz., that proclaiming British Sovereignty over all the Islands of New Zealand, which ran thus;—"extending from 34 deg. 30' North to 47 deg. 10' South latitude," &c. I duly executed the order, and subsequently pointed out to them what I deemed to be an error—*North*

for South! Soon after that Proclamation was set aside, and a new and corrected one issued. One of the last works I executed for the Government was the printing of the *first* Government Gazette issued in the Colony, (December, 1840,) in four pages, demy 4to.,—but without the Royal Arms. For all that I did for the Government I never received any pay or recompense whatever from them, neither anything extra from the Church Missionary Society; but I did receive a very handsome letter of thanks, wholly written by Governor Hobson himself,—although at that time from long illness and injury to his arm he was scarcely able to write.

Note B, page 8.

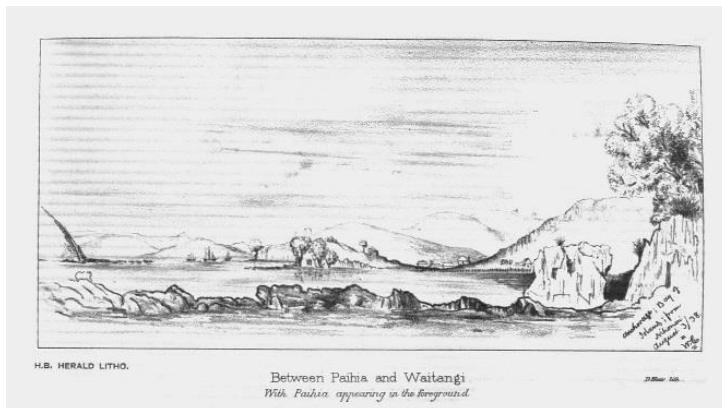
In the early days of the Church Mission in New Zealand, it was absolutely necessary to have a quantity of goods stored for the use of the various scattered Mission Stations, and for barter with the Maoris—wherewith to obtain daily food, &c. At that [32] time and for long after there were neither stores nor shops in the land, and communication with England, or even with Sydney, was very rare, and not to be depended on. And as the Maori tribal wars were frequent and severe, it was needful to have a secure building in a suitable situation to contain the Mission goods; hence the large general Mission Store was erected at the head of the Kerikeri river. It was strongly built of stone on the bank of the river, and was quite a massy structure; certainly in those early days it had a very imposing appearance from there being no other building like it in all New Zealand; its white Sydney sandstone facings being, also, such a contrast to

its dark-blue stone walls. It was especially striking in rowing up the long and desolate river, (not a house nor even a Maori plantation nor fishing-village on both its sides,) and coming suddenly upon it on rounding the last bend only a little distance ahead. The doors were very thick and strong, reminding me of those of a prison or a fort; and the windows were also well-secured on the inside with strong iron bars; so that on the whole it was pretty safe both from sudden Maori attack and from fire. The Kerikeri river is navigable for vessels of 100 tons to within three or four miles of the Station, and for small craft (such as the Mission Cutter) close up to the wharf alongside the Store. It was in this building that the Bishop of New Zealand, Dr. Selwyn, securely stored his large and valuable Library during his residence of three years at Te Waimate.

Note C, page 11.

The British Resident, Mr. James Busby, resided in his own house at Waitangi, Bay of Islands; this was about two miles by the sea-beach from the Mission Station at Paihia, with a small navigable tidal river between, and he had no neighbours. A Maori Chief of middle rank had taken offence for some small matter, (an easy and common thing in those days!) and Maorilike was determined to have his revenge. So, one night, he crept stealthily through the garden up to the house with his loaded musket, and squatted in the front verandah; and having, as he thought, exactly determined Mr. Busby's position (who was sitting writing at his table in his parlour,) from the shadow cast from the lamp on to the

window-blind, he took steady aim and fired at his head! the shadow, however, being both enlarged and raised, the ball, fortunately, passed a little above his head, and lodged in the plaster of the wall of the room. The would-be man-slayer then returned to his people and village, not very far off; he was, however, soon known, as he did not attempt to conceal it, rather the contrary. The evil deed naturally caused a great deal of disquietude among the unprotected white residents scattered throughout the Bay; and no small number of meetings and amount of inflamed talk with the friendly Maoris. Mr. Busby [33] bore it all very well; and eventually a block of land lying between Waitangi and Te Waimate was publicly ceded to the British Government as a kind of compensation for the crime.



Between Paihia and Waitangi.
With Paihia appearing in the foreground
 H. B. HERALD LITHO. D. Blair, lith.
 Anchorage; Bay of Islands; from Nihonui; August 3/38.
 W.C.

Note D, page 12.

His kind note which came with them is so highly characteristic of him, that I am tempted to make an extract from it. —

“Waimate, March 14th, 1836.

“My dear Friend,

“I herewith send you twelve chapters of Matthew, and will endeavour to have more in readiness very shortly..... While employed in your own particular department you will have the comfort of knowing, that you are fulfilling one of the most important parts of the work, a work without which the rest will be paralysed. I trust when you see the result of your own labours in the hands of the natives, knowing the blessing that must follow, you will be able to rejoice with a joy which will not be intermeddled with. The Missionary body in New Zealand hang together as members of one body, and you may depend upon it, that so far as you are concerned, the rest of the members will do their utmost, not only to remove every difficulty, but to render every assistance which is practicable.

“Wishing you more encouragement in your work, and hoping that we may rejoice together over it,

“I remain, Yours most truly,
(signed) “W. WILLIAMS.”

“Mr. Colenso,
Paihia.”

Note E, page 13.

And not only for such a reason as is there assigned. More than once during the printing of the New Testament my household Maori lads (or young men) left me, unexpectedly and suddenly, and that without notice or warning. This, however, was mainly owing to their belonging to the neighbouring tribes and villages. I well recollect on one occasion in particular, (in January 1837,) how I was served by them, and how I also managed to turn the tables upon them! it is worth relating. One morning after School and breakfast, I left my dwelling-house for the Printing-office, as usual; giving directions to the man-cook to get ready the simple dinner. It had so happened that morning, that I had been obliged to say a few words to one of my rowers, (a high-minded young chief named Hatete, lately come to reside with me from his tribe at Waiomio a village a few miles beyond Te Kawakawa.) On my return to my house at the dinner hour, I found all hands had vanished! taking all their clothing and blankets with them, leaving behind on the table a very laconic note, containing these words,— “*E mara, kua riro matou: hei kona ra.*” (= O Sir, we are gone: remain in peace.) [34] Disappointment and vexation having subsided, I found they had not gone away by water in a canoe, the usual course, therefore I surmised they had gone to the *pa* (village) at Te Kawakawa by an overland route, a long hilly and difficult way, little known and rarely ever used, one which they could not possibly travel over in a single day, and there were no intermediate villages, so I laid my plan accordingly. The next morning early I started in my whale-boat, with four Maori rowers, kindly lent me by

Mr Baker, for Te Kawakawa, and arrived there at the *pa* just after the runaways! who were then relating their escapade in a crowded circle of their own people. And so intent were all hands to listen, that no one saw me until I made my *debut* suddenly among them. (This I had contrived, on nearing the upper landing-place with almost muffled oars; my Maori crew entering heartily into the plan, as I feared if the alarm was given (they having arrived before me), they would have secreted themselves or gone farther.) I did not speak to them at first, but to the chiefs and people, and it ended well,—in matters being cordially made up between us, and in my bringing them back with me in my boat to Paihia, where we arrived late at night. The next morning at the School, their appearance caused much derision. To the credit of their fathers and the old chiefs they all gave them good advice, and roundly took my part, as by the runaways' own showing I had done them no harm, and still further (as the chiefs said) I was engaged for them all on that great work the printing of the Maori New Testament. My prompt and effective acting on that occasion stood me in good service afterwards. All the New Zealand Missionaries had frequently to contend (or rather, put up) with conduct of this kind on the part of Maori domestics (both male and female) and workmen. Such, too, was sometimes shown when it could not well or readily be met or borne;—even by a guide in an unknown part of the country, as I have too often proved. That “*pokanoa*” (as it was well and expressively termed) sudden and entire change of mind, or work, without cause; mutability, fickleness;—was a well-known trait of the

Maori character, and far too common among themselves.—

Note F, page 16.

One day I had to cross the Bay to Kororareka, purposely to bury one of those poor fellows whom I had known, and who was drowned in attempting to ford this river in his way to the Bay from Te Waimate. I myself have had to swim across at various times; and on one occasion in particular had a very unpleasant time of it. I was returning to Paihia from Te Waimate, on foot, and on my arrival at the river I saw it was under flood, the water being also muddy. I did not like to go back to Te Waimate, as my day had been fixed for my return to Paihia, and I feared I could not carry all my clothing over on my head [35] dry,—it being however the summer season I was very thinly clad. While I was deliberating, and trying the depth of the water near me with a string and stone tied at the end of some rods, (flower-stalks of flax joined together,) a party of Maoris, men; and women, (who were encamped in the neighbourhood on the opposite side,) made their appearance through the fern and scrub and squatted down on the bank of the river, watching my movements. Being strangers they would not assist me,—other than to offer to fetch my clothes and carry them across before me, which I would not agree to. It was a time of great embarrassment; the day, too, was passing, and I had many miles yet to travel,—besides the ugly dreaded Whauwhauroa crossing at low tide!) They lined the bank in the sun at the only landing place; laughing and saying they wanted to see

how well a White-man could swim, &c, &c. As there was no alternative I prepared for the worst—a good wetting of my clothes. I cut flax leaves and tied up my clothing in a pretty compact bundle, which I fastened up so as to carry on my head, keeping my shirt loose in my straw hat. I had previously sounded the depth of the water, and, at last, entered the river backwards, and when out of depth turned and swam till near the opposite shore, when feeling the ground, I again turned, and by degrees put on my shirt, and so got to the bank,—not a little vexed with that party of Maoris; who, however, were loud in their praises (?) of “the cunning White man;” and who, long after, said, had they but known me, or had I told them my name, they would have assisted me to cross. [To tell one’s name, at any time, was, however, not in accordance with Maori etiquette.] The great danger in crossing the New Zealand rivers in the olden time, arose from the denseness of the tangled vegetation on the banks, which also extended overhanging a long way out into the river; so that if you did not happen to hit the one narrow and worn landing place, through the rapidity of the current, there was little chance of getting to the bank at all.

Note G, page 17.

A notable instance of this kind occurred in the summer of 1836. There had been for some time sad variance between two sub-tribes of Ngapuhi, respecting the rights to a piece of waste land on the outer coast between Whangaruru and Whangarei; and at last it was agreed by both parties, to take their case to Waitangi, and there for Mr Busby, British Resident, and the Church Missionaries

of Paihia, to hear and to act as umpires, and so end the quarrel. At the time fixed, a large party of Maoris assembled there, and Messrs H. Williams and C. Baker went thither from Paihia—I remaining in charge at the Station. In the afternoon their decision was given, which so exasperated the losing side, (mostly wild heathen,) that they flew to their [36] arms, which they had secretly brought and hidden, and fired right and left, killing two and wounding others of the other side who were unarmed. The consternation was great! The killed and wounded were brought to Paihia; one of the two killed was a fine young man of the Station, a married domestic of the Rev. H. Williams named Taha, and one of my best Maori teachers in the adult Maori School, where he had on that morning worked with me! The wounded I had to attend to, and one of them, a chief of rank from Whangarei, was shot very seriously through the groin, so that for some time his life was despaired of, but he was eventually cured, and became a Christian. He remained several weeks at Paihia in my charge. For a considerable time after that occurrence armed bodies from the wounded party and their friends came continually to Paihia, to meet, to talk, and to combine for war, to avenge their loss; but after some time, through our always meeting with them and advocating peace, we prevailed. The loss of time, however, was great, all work at a standstill.

Note H, page 17.

The interesting and pleasing visit of Daniel Wheeler and his son George, Members of the Society of Friends, in

their yacht "Henry Freeling," should also be briefly noted by me, as it was both unique and of good service. These good Christian men had been making a religious visit to the various Missions in the South Sea, and were now on their return voyage to England. They arrived in the Bay of Islands in November 1836 and remained nearly two months with us; during which time they visited several of our nearer Mission Stations. D. Wheeler, being both aged and rather infirm in body, was carried by Maoris in a chair when visiting the inland Mission Stations. On one Sunday in December, according to appointment, they accompanied me in my Mission boat to Te Kawakawa, whither I went to hold Divine Service, and where D. Wheeler preached in English to the Maoris, I interpreting. It happened to be his birthday (when he attained his 65th year), and this was an extra theme of rejoicing with him. We spent a pleasant day together; a day to be remembered! As we were obliged to land at the lower landing-place owing to the state of the tide, the elder felt the long walk through the fern and scrub to the *pa* (about a mile), which also caused us to be rather late; on our return we were overtaken by rain just as we got to our boat, but we reached their vessel and the Mission Station, "all right"— save a wetting. I saw them often, and having been formerly well-acquainted at Home with Members of their Society, (also, occasionally attending their places of worship,) I was very much pleased with their visit, and they with the Printing-office and the work then in hand, Their yacht was very nicely found, and [37] their state-cabin or sitting-room was fitted up with an astonishing number of curious articles and natural specimens from the Islands; giving it the appearance of a

Museum. I retain many pleasing recollections of their visit. They reached England in safety, and published an interesting account of their long voyage; but have both long ago been gathered to their fathers.

Not very long after they had left us, the Rev. S. Marsden with his daughter and voyaging companions arrived at Paihia; they came by the way of Hokianga and Te Waimate, and remained with us till the 4th July. On Good Friday, (about a week after Mr Marsden's arrival,) I had a very peculiar and unpleasant adventure. [I quote chiefly from my Journal.] Called on, unexpectedly, this morning, to go up the harbour to Pomare's *pa*, Otuihu, to bury a man who had been murdered by the Maoris two days before, and also buried secretly by them at the foot of the high cliff near which the *pa* stands. There were several Missionaries at this time at Paihia, who had come to see Mr Marsden, but I was told off on this errand. I went with the Captain of the American whale-ship in his boat, from the Station, he taking a coffin he had got made on board, and spades, &c., and a crew of six or seven strong seamen, the murdered man having been his steward. On landing under the cliff, I directed the seamen to disinter the body. A Maori who was there, ran up the hill to the *pa*, to inform Pomare; the Chief soon made his appearance on the brow of the farther cliff, and bawled down to stop! while I encouraged the men to proceed: they however were afraid and irresolute, half-hesitated and talked, and did not work as they should have done. I told them they were not Englishmen!—for they had soon uncovered the body, only slightly put under the earth, (or rather thrown there at the foot of the cliff and a, little clay from the face of the cliff knocked down upon it,) and

they might have got it easily enough on board of their boat alongside the bank in deep water. Pomare then came down to where we were, in a boiling rage! and first he vented his passion on an unfortunate European who lived there close by in a small hut, (as he had pointed out to us the spot where the body lay,) and not content with striking him, persisted in driving him into the sea!

Meanwhile, the crew had taken to their boat, with their spades, leaving the coffin, and pushed off into deeper water. I saw that Pomare had been drinking, and I interfered on behalf of the poor ill-used White; this brought the chief on me. I happened to say, in our wordy dispute, that Rum had turned his head!—which, of course, was immediately magnified into a dreadful curse! and he got into a towering passion, declaring, if I were not a Missionary he would kill me! I took off my hat, and lowering my head close to him called on him to strike, &c, &c. He got worse and worse, at length demanding that the coffin should be given up to him; [38] this I was determined to resist and ordered the wondering crew to jump out and take it on board their boat. He demanded, “Why I dared to dig without first asking his leave?” I retorted, “Why did you, or your men, dare to murder the White-man without first asking leave of us?” He ordered me to the boat; I refused to go; he came up and gave me a shove, I retaliated with another; he repeated it, and so did I: fortunately our handy-work ended here. The Captain and crew, seeing how matters were, wished me to enter the boat, saying, they should abandon the job; on hearing this I requested them to come back, and bury the body deeper; this they did. Pomare now said, I should never again enter his *pa*; I rejoined, I would do so, and then and

there that very day before I should leave. He returned slowly to his house, stopping and warning me not to follow. Of course many Maori were now looking-on, silent spectators. I climbed the high hill, or zig-zag track up the face of the cliff, after Pomare, (much against the expressed wishes of the Captain and his boat's crew,) and went on to the entrance of his large house, and sat down on the door-step; he and many of his people were inside, and a bottle of rum was handed round, of which all hands partook. After some time, I rose to go back (as the boat was waiting for me), telling Pomare, I had fulfilled my promise. On my way down the hill, Pomare came out and called after me to take away the body; but the Captain would not have any more to do with it,—saying, they had done their duty, &c.—I learned afterwards, that the poor steward was greatly liked on board of his ship; he had only gone ashore at the *pa* (below or rather on the strand on the other side, where the grog-shops, &c, were) three days before, in the afternoon on a two-hours' leave, and was returning sober to his ship carrying a bottle of rum, which some of the Maoris seeing demanded from him; he refused to give it up, on which they pursued him and he ran into the sea, where in the end they killed him; and then to hide their deed, dragged the body to the farther side and deposited it at the foot of the cliff, &c. The Captain, in his search after the missing steward, had gathered this (privately) from the White residents, but the Maoris of the *pa* had denied the deed, also the burial; so that it would have been useless to apply to the chief.— This was one of the *few* cases in which, during my long residence in New Zealand, (though often in danger,) I

was struck by a Maori, or struck one in return; but I would never put up with a blow.—

Note I, page 17.

Two or three rather peculiar events that occurred during this long and dreary struggle of internecine warfare in the Bay may be mentioned; especially as such are never likely to happen again. But, in order the better to understand them, [39] one should first know something of the fighting ground and the position of the combatants. Several of the smaller tribes of the Ngapuhi (united) were in arms against the two chiefs Pomare and Te Mauparaoa and their followers and adherents; the head quarters of the Ngapuhi allies was at Kororareka (now Russell), which commanded the outer harbour; that of Pomare and Te Mauparaoa at Otuahu (where these chiefs both dwelt), an almost impregnable castellated war *pa* at the head of the narrower inner harbour, centrally situated between the two navigable estuaries of the rivers Te Kawakawa and Waikare, and commanding the whole of the inner waters, and about six miles from Kororareka. On a fine calm morning in the summer of that year (1837), at a very early hour, when the waters of the Bay were like glass, before the daily rising of the ruffling sea-breeze,— a small canoe with only one man in it was seen paddling in haste from Te Wahapu on the opposite shore of the narrow harbour (and about half the distance between Otuahu and Kororareka,) towards Waitangi on the Paihia side. This man was the (afterwards) renowned Hoani Heke. He had crossed over before day from his village at Te Ti on the Waitangi river, to purchase powder from the

merchants' stores at Te Wahapu wherewith to carry on the fight; and the eagle eyes of the foe from their eyrie or look-out on the high *pa* at Otuihu had descried the little canoe, and rightly guessed the errand. In a twinkling Pomare's big war-canoe, being all ready at anchor, was manned, and now the exciting chase began! Heke had seen her coming, and well-knew there was no hope for him there—at Te Wahapu—among his White friends, (who also were anxious to get rid of him, knowing they were powerless to protect him;) and so he put out to sea, taking his kegs of powder with him, really paddling for dear life! I suppose there were at least sixty rowers in that fine and handsome canoe; she glided through the water like a fast steamer, only noiselessly; while those on board of her (warriors) who were well armed with guns kept up a continual and rapid fire upon the tiny cockleshell fleeing before them. And Heke! he, too, dared to return the same; absolutely laying down his paddle now and then, and loading his piece and firing at them backwards over his shoulder—in mere defiance and bravado!! All hands in the Mission Station were out on the sea bank looking out, expecting every moment to see him struck with the balls playing around him; and feeling sure he could not possibly escape from the fleet war-canoe rushing after him; death seemed imminent—certain. But when the war-canoe had come down into the more open harbour, clearing the peninsula Toretore beyond Te Wahapu, and getting abreast of Kororareka, the Ngapuhi there, hearing the firing and seeing what was up, had speedily [40] manned their canoes, and came out to the rescue and the attack; when Pomare wisely returned. From an entry in my Journal, I find, that shortly after

this, the Ngapuhi tribes went up one morning in 36 canoes and boats to attack Otuihu; they landed there and fought, and several were killed and wounded on both sides; among them some head chiefs of note. In the evening they returned to Kororareka, bringing off their own dead and wounded, and also the bodies (chopped up warm and divided among them) of two chiefs of their foes, killed in that day's fight, who had only the day before arrived at Otuihu from the interior to join Pomare; both, too, were good friends of mine. For one of them, in particular, Te Koukou, I felt very much; for he had recently received me and my travelling party of Christian Maoris very hospitably, on my visiting his *pa* for the first time in my returning overland from Whangarei to the Bay; and had also then given in his adherence to Christianity. Hearing that the Maoris at Te Ti (near us), had got an arm and shoulder of Te Koukou as their *share* of that war-spoil! I walked there early the next morning and induced the chiefs to give them up to me,—the mischievous and brave chief Te Kemara, himself climbing the tall *Karaka* tree to bring them down; to my surprise the whole arm, &c, was still supple! (Te Kemara was a little lithe nimble fellow, though of middle-age, and being fully and closely tattooed so as to be almost black, he always reminded me, when in heroics! (and he just could roll his eyes and grimace!) of one of Dante's demons—in *Inferno*!!) I subsequently saw at Kororareka, other and sickening portions of Te Koukou's body, hacked and stuck up on the tabooed temporary fence erected around the body of the great chief Pi, of the Mahurehure tribe, also slain the same day in that fight; Pi with his people had come over from Hokianga on the

West Coast to join Ngapuhi in the fight. The body of Pi was laid out in great state, &c, &c.; and as I had visited this large party of allies on their arrival at the Bay, while they were encamped at Waitangi, (before they crossed over to Kororareka,) and addressed them as to possible consequences, I now went inside the sacred enclosure, (much to the dislike of many of the Maoris present,) and took my stand close to the dead chief's body, and there told them my mind. To narrate the whole scene and what took place on this sad occasion would take too long. However, I could not prevail on them to give me the fragments of Te Koukou, all I could obtain was, a promise they should not be cooked and eaten; but two of the head chiefs of Kororareka, Rewa and Te Wharerahi, gave up the portions in their possession for burial.— [41]

Several attacks were made at Otuihu by the united Ngapuhi, who had always several miles of water to cross before they could begin operations; sometimes they turned out twice in the week; while Pomare and his party kept in their *pa* and never once ventured to return the aggression by attacking his foes at Kororareka; yet he did go down more than once into the Bay of Kororareka, in his fine war-canoe, and there blaze away—but not within gun-shot. During this long war we (the Missionaries) had often tried in vain to bring about a peace between the belligerents. The great obstacle, at *first* and for some time, being, that the scales could never be made equipollent; as, according to Maori custom, peace could never be brought about until this was accomplished or nearly so,—losses on both sides must be made square or equal. On the one day the Ngapuhi side were the heavy losers in fighting; on the subsequent day the other side

were so, too—and beyond what was required! and so it went on.—

One day in particular, towards the end of the war, when (it was said) a decisive assault was to be made by the Ngapuhi, I accompanied the Rev. H. Williams in his Mission-boat to the fighting-ground. Our boat pulled up the harbour to Opua, where we landed on the little beach, and walked out over the rocks to the bold cliff, whence we had a full view of Otuihu on the opposite shore directly before us about half a mile distant. The Ngapuhi had previously landed on both sides of the narrow arm of the harbour, and taken up their position on the two jutting headlands,—one at Opua where we two were, and the one nearly opposite Oropa,—where they swarmed on the exposed ridges. A large amount of musket-firing was kept up on both sides, but very little harm was done, owing to the two parties being too distant from each other. We two were pretty safe, being partly sheltered by the steep rocky headland and by the large overhanging Pohutukawa trees that grew there, while with our glasses we could easily watch Otuihu. Pomare's people made some slight advance towards their foes in canoes, from which they kept firing as well as from the cliffy brow of their *pa* above, but only now and then balls fell among or near the Ngapuhi. While this a being carried on a rare thing happened: a reckless bravo (*toa* warrior) paddled fearlessly from Otuihu towards the Ngapuhi in a little dingy—or really small canoe (*kopapa*), suited for one or, at most, two persons; he actually came over into the open water in the midst of those two headlands, nearly abreast of us two on the rocky point, between the two bands of Napuhi! and there he openly defied them in his song,

brandishing his paddle, and turning round put his head down in his canoe and smacked his naked posteriors at them!! which done he paddled back to his party *unhurt*, singing as he went. [42]

The Ngapuhi showered balls at him from both ridges; they fell around him like hail, splashing the water around him, but he escaped; I don't think his canoe was hit. It seemed to me that the fellow really had a charmed life; it was one of the most coolly sustained foolhardy doings I ever witnessed. We both made sure he must be killed, and marvelled much at his escape, while the Ngapuhi were very savage over it; at the same time setting it down to the efficacy of the *karakia* (= spells) which had been used, and on which he had relied. They, also, had both seen and heard of similar feats having been performed before—in the olden time.—

On that day, too, I watched some of the Ngapuhi side (raw recruits?) load and fire off their guns, mostly old flint-and-steel muskets; some actually held their pieces nearly vertical and turned away their faces when they fired; while some, in their haste, fired away their ramrods! one, who was very near me, in loading bit off the end of his cartridge and cast it down; seeing it was a printed scrap (a most rare thing! for there were no common Newspapers then, and I never allowed a bit of printed (or waste) paper to go out,) I took it up and on untwisting it found it to be a portion of a leaf of an English Bible, and to my astonishment containing these words— “How long have I to live?” (2 Sam. xiii, 34.) I showed it to Mr. Williams who was equally surprised. I afterwards heard at Kororareka of some books having

been stolen by the Maoris there for the purpose of making cartridges, and among them was a Bible; paper of all kinds being then with them very scarce.—

I have mentioned, above, what was at *first* the cause that hindered peace being made; and afterwards—when both sides were pretty well tired of the costly and savage game at which they had been so long playing, and the general planting season near,—the *second* obstacle was the demand made by the Ngapuhi, that Pomare should cede to them certain lands on the adjoining Waikare estuary. A day was, at length, fixed for a meeting at Otuihu and fully discussing the terms of peace, when all the Missionaries then in the Bay district went up to Otuihu in the big Mission boat, having a white table-cloth flying at the mast head as a Peace standard; several neutral (or related) Maori Chiefs also going thither in their canoes; there we spent that day in endeavouring to bring matters to meet—but, again, in vain! as Pomare would not yield any land for that purpose, having had also a large number of killed and wounded on his side. Notwithstanding, peace was firmly made within a fortnight from that visit; and about the same length of time after the Rev. S. Marsden's last departure from New Zealand.— [43]

Note J, page 21.

I have said, that silver and gold coin was very scarce,—in fact, not required. I never had any; a few small coins (silver and copper) I had happened to have on my landing in New Zealand remained unused in my desk for many years. All our monetary requirements were met by small Orders, which were in high request at the few Merchants'

Stores, as by-and-by when they made up a pretty large amount they were exchanged for Bills on the Society in London. The only coins I saw for several years (and then only casually and in the possession of others,) were dollars in silver and doubloons in gold. The American dollars however, were much sought after by some of the Storekeepers; those of Mexico bearing a greater exchange value than those of the United States.

Note K, page 23.

On the 1st January we left the Bay in the Mission Schooner "Columbine"; on the 4th we anchored inside of Tauranga harbour (under Maunganui), and remained on shore till the 12th, visiting the various *pas* there—Maungatapu, Otumoetai, &c., in which were a great number of Maoris, some of whom I had formerly seen at Paihia. Here I gained some curious information from old priests. On the 12th we recommenced our voyage, and landed at Wharekahika (Hicks' Bay) on the 16th, there we found Te Houkamau, one of the principal Chiefs of the East Coast district, with a number of his people. I should, perhaps, here mention, that on our leaving the vessel, (which was to proceed to Poverty Bay and there await our arrival overland, by the Coast) the steward and others *cried!* saying "They should never see us again!" Such was their opinion of the East Coast Maoris (from the East Cape Southwards), who had long borne a bad name for being treacherous to shipping and to seamen visiting their shores. From Hicks' Bay we travelled on by the Coast to the Valley of Waiapu; astonished at several things both natural and artificial we there saw. 1. the

large amount of grassy plains and hills wholly unknown at the North: 2. the immense size and strength of their war *pas*, closely filled with houses: 3. the great number of the people, all healthy. We also noticed the absence of some of the commoner and picturesque trees of the North,—especially the shore loving *Maanawa* (= Mangrove), and the *Pohutukawa*; the *Kauri*, too, was not seen inland in the forests.

We halted at Rangitukia, a very large and well-built *pa*, where we stayed a few days. Soon after our tents were pitched in an open space or square within it, we found that we could not get outside for any purpose! the Maoris were [44] so numerous, forming a compact mass of many hundreds—men, women, and children,—all eager to satisfy their curiosity and see and observe the White-man! At last we were obliged to appeal to the head chief, to have a way of egress and ingress left open to us, and he repeatedly spoke to his people, but in vain; the foremost ranks being hemmed in by those in the rear; (for all the world such as I had formerly seen in a dense London mob.) At length, and as a last resource, the Chief threw off his fine dress mat garment, and went naked to work! rushing up and butting like a ram against the people, who were soon tumbling all of a heap on all sides—mainly from the fear and dread of being touched by his head, which, of course, would make them *tapu* (= sacred) for a season, and so be attended by disagreeable consequences of privation to themselves. However he succeeded in clearing a way for us,—though many high words followed, used by other chiefs of note who were also overthrown pell-mell in the *melee*!

From Rangitukia we went further up the Waiapu Valley to Whakawhitira, a very large *pa*, the largest by far that I (or we) had ever seen. Its fence was also threefold, the massive and combined outer one being twenty-five to thirty feet high; its main posts consisting of entire and straight trees denuded of their bark, with large carved full-length human figures painted red on their tops,—of these figures there were above a hundred. During our stay there, we measured, by stepping, one of the sides of this *pa*, and found it to be more than a mile in length! and the huge carved figures we ascertained to be more than six feet high, with their heads fully and deeply tattooed;—this we proved from one that had been broken off and fallen, and placed upright below its big post. I took a sketch of this *pa* (as I had also done of Rangitukia) which I still have.

While at Tokomaru (the large *pa* at the North end of that bay), being tired of cliff climbing and beach walking (there being no footpaths nor tracks along the coast from one *pa* to another,) we gladly accepted the offer of the chiefs to take us by canoe to Uawa (Tolaga Bay); so, one morning we left Tokomaru *pa* in a big canoe well-manned; but the sea rose high before we had gained the southern headland of the bay, and for some time it was doubtful whether we should be able to round it—or ever land again, for we were in great danger. Apart from our perilous situation, it was truly a magnificent sight! to see those big ocean billows breaking on the rocks around, and our little bark threading her winding way in the hollows between them. The chiefs, seeing the danger, held a short consultation, whether to go on or to attempt to return to Tokomaru; I believe they would have [45]

returned, but they feared to attempt turning the canoe in the great swell we were in lest it should be upset. I was never more impressed with the admirable skill at navigation possessed by the Maori! how readily the rowers (or paddlers) obeyed every command given by the skilled steersman, and how regularly and ably they wrought! The chiefs, too, and the *Kai-tuki* (= singer-of canoe-songs—which is done both to encourage the paddlers and to enable them to keep time,) retained their standing positions in the canoe and never flinched! On rounding the headland we landed in a delightful little cove, called Te Mawhai, having a curious looking high pillared rock just at its entrance, and there launching a still bigger canoe (which was hauled up high and dry and protected under a long covered shed,) we started afresh for Uawa. On arriving at the bar at the mouth of the river, most of our crew jumped overboard and holding on took us over the bar in safety. I need not remark how glad we were, to get safely on shore; not merely on account of the dangers we had passed, but from being cramped up in the canoe during our very long day's paddling—I suppose quite forty miles! While stopping here I conversed with old chiefs who had seen Capt. Cook and his ships when at anchor here in this bay.

I may also mention, that all along the Coast, in many places, we saw small rafts hauled up above high water mark, each being eight or ten feet long and three or four feet wide, composed of only a few small poles, roughly and distantly but very strongly lashed together with open spaces between them. On these the East Coast Maoris went out to fish in deep-water, one on each; and also, (when opportunity offered) to a ship with a pig, or two,

fastened to the raft! They said, these rafts were quite safe, more so indeed than a small or middle-size canoe, as there was no danger of upsetting.

We were nearly a fortnight in reaching Poverty Bay from our leaving the ship, and great was the joy of our shipmates when they saw us! having given us up. After staying some time at this bay, visiting its neighbouring *pas* and villages, we left on our return to the Bay of Islands, visiting also Tauranga (a second time) and the upper Thames (Waiheke, &c.,) on our voyage back.—

I have already mentioned my bringing back with me to Paihia nine youths and young men for Instruction, &c.; two of them became useful pressmen, and served well in the Printing-office. At that period the Rev. Dr. John Dunmore Lang (of Sydney), arrived at the Bay, where he stayed some time on the opposite shore of the harbour; during which he once visited the Mission Station at Paihia. It so happened that I alone was at home on that day and so received him at my house; he sat some time with me, made several [46] enquiries, and partook of refreshments; when he expressed a wish to see the Printing-office, of which he had heard; on our going thither and entering it, he manifested great astonishment and pleasure at seeing the two young Maori pressmen at work, and that, too, by themselves alone in the office. I mention this little incident here, because when Dr. Lang published his account of his visit to the Bay of Islands, he not only said a few unkind things in it of the Church Mission in the Bay, (which he had gathered from the idle and their associates at the port of Kororareka,) but he also carefully abstained from mentioning this circumstance, at

which he had showed so much satisfaction, or even alluding to it!

I may further remark, that one of those young Maoris learned to write before that he could read! and so, sometimes, wrote to his relations and tribe down South. Maoris in our Station School generally learned to read well (beginning with A) in six months; they privately diligently conned their one book in spare hours and in wet weather. In the reading classes in school there was generally great attention and emulation shown to catch one of the older scholars making a mistake—and so taking him down, to which they always good-humouredly submitted.

Another circumstance I should also mention, as forcibly showing the great power of the mind and feelings (superstitious imagination) over a strong healthy man. And this, I have ever believed, is the root of that fearful power formerly so very prevalent among them, and so greatly dreaded, under the name of *maakutu* (= deadly spells and witchcraft); of which even Settlers of to-day have also heard something. Not very long after our return to the Bay of Islands, a serious epidemic suddenly became common, among Whites as well as Maoris and some of the former and many of the latter died after only a very short illness. The attack began with common feverish symptoms, severe headache and determination of blood to the head, soon followed by swelled and sore throat, which quickly carried off the sufferer. I myself was attacked, and indeed brought very low—all but entirely given up! My Maori lads (now eleven in number) were all naturally very anxious about me, and scarcely cared to cook food for themselves, or to eat; at the same

time they were all well and had escaped this sickness. On the last day of my very severe illness, when it was known that the crisis was at hand; one of those young men whom I had brought from Tologa Bay,—a stout, strong, healthy, able, fearless Maori,—who was much attached to me, —fully believed that I should die that night; he would not be consoled by nor even listen to the Missionaries present, neither by the Doctor, Ford, who also attended [47] closely on him, and by the next morning he, poor fellow! was dead,—and the unfavourable crisis was also passed with me. Dr. Ford always maintained, that there was nothing whatever ailing him physically, on the contrary he was perfectly healthy; it was solely the effects of his imagination!! in which I concurred. Possibly, had he been allowed to *see me*, in my bed, he might have recovered. I have also known of cases somewhat similar occurring among the Maoris; but this is the more striking from the fact, that it was not the fear of *maakutu* falling on the sufferer himself, but on another to whom he was attached.—

Note L, page 25.

On several occasions in former years I had brought this matter, of a new consonant being required for the New Zealand language, before the Committee of Missionaries, but always without anything definitely being settled about it. Again, in July, 1841, at their half-yearly meeting, in an official letter to their Secretary, I made the following request, (among several others):—

“9. An order, authorizing the adoption of an additional consonant, in order that the deficiency still existing of

some character to represent the “*wh*” sound,—a subject of material and increasing consequence,—may be, without any further delay, supplied.”—

The reply was, — “Wait a little, until we consult Rev. W. Williams:” (who was then residing at Poverty Bay.)

In September of that year I also wrote to him on this subject; from his letter in reply I make the following extract:—

— “With regard to the orthography of words beginning with “*w*, ” and the propriety of making a distinction to mark the “*wh*” sound; I have to make the following observations:—

“If the general opinion be in favor of an alteration which would doubtless make reading easier to an Englishman beginning the language, I do not object to a change. Should such be the decision of the collective wisdom of North and South, I would suggest that your proposal of the letter “*v*” be adopted to make the “*wh*” sound. I have not heard on the subject from the Northern District Secretary. Perhaps an accented “*w*” would be more appropriate, and would do less violence to the orthography.—Turanga, Sept. 7, 1841.”

Time rolled by, and another year was half through; and as nothing had been done by the Northern District Committee of Missionaries in this matter, at their subsequent half-yearly Meeting in January, 1842, (and as the Rev. W. Williams did not now meet with them, he belonging to the Southern District,)—in June, 1842, I wrote the following letter to their Secretary:— [48]

“Paihia, June 13, 1842.

“My dear Sir

“I enclose for the consideration of the Committee a few printed Maori sentences, as a specimen of certain proposed alterations, which, for some time past, have been had in contemplation by different individuals who have given their attention to the Native language; one of which, it is thought, it is highly expedient should be adopted with as little delay as possible.

“I believe that it is now very generally conceded, by all parties understanding the Native tongue and competent to give an opinion thereon, that some character is still wanting to represent that sound in such common use, and hitherto known in oral communication by the combined consonants “wh.” Believing this, it is not my intention to say anything further on the *necessity* of selecting some character to represent the same.

“Among several characters that have been from time to time proposed by different persons, to convey the idea of the sound under consideration, the following are the principal;—viz. the “wh,” (which has been lately partially adopted by the Wesleyan Missionaries in their books, and by the Rev. R. Maunsell in his “Grammar,”)—the inverted comma “‘,”—the apostrophe “’,”—the “f”,—and the “v”. Printed sentences, containing these characters, I now lay before the Committee, on whom it will devolve to say,—which shall be chosen to distinguish this peculiar and hitherto undistinguished sound.

"I beg, also, to offer a few remarks, which I venture to hope may not prove altogether unworthy the attention of the Committee.

1. "That the "wh," though at present in partial use, being two consonants is at variance with the universally acknowledged fundamental rule of all the Polynesian dialects—of no two consonants without a vowel between. If, however, it be urged, that the "wh" is here to be considered as only *one* character, then it will, of course, have to stand in the Alphabet under its own proper name; and therefore, from its possessing a heavy inelegant appearance, from its taking up much room in printing (owing to its size), and much time in writing from its complex shape,—I think it should be rejected.
2. "That the character wanted being intended to represent a true and distinct consonant-sound, and not merely the lengthening nor the shortening of a sound already produced by any one of the present number of consonants, the proposed addition of an inverted comma, or apostrophe, to the "w," would not be at all adequate to the thing required. Besides which, either is liable to the same objection as that already adduced against the "wh," —the being at variance [49] with all the printed Polynesian dialects. To say nothing of the very hiatus-like appearance which such marks always impart to printed pages, particularly in long words and with large type.
3. "That in my proposing the "v" to represent the character in question, it has been borne in mind,—1. that it is already in use in several of the Polynesian dialects:—2. that it is a small and neat, and (in writing) a

quickly-formed character:—3. that the Rev. J. Hobbs (at present the Wesleyan Superintendent,) has promised to use his influence in getting the “v” substituted for the “wh,” (now used by them,) should the Church Missionary Committee of Missionaries adopt it:—4. that the Rev. R. Maunsell has informed me, that he intends using it for the future in his “Grammar,” now in course of printing at Auckland, and which will doubtless (if not already in use) be adopted by the Government;—and, 5. that from a similarity (though distant) in the Maori sound, for which a character is now sought, to the sound of the English “v,” future Missionaries and new-comers generally will be assisted in reading in the pronunciation of the same.

“In conclusion, and with the utmost deference, I beg permission to express my hope, that in the consideration of the matter in question, each Member of Committee will ingenuously dismiss from his mind those prejudices which, too often, unfortunately, stick as closely to the skirts of abstract literary and scientific questions as to other matters whether social or political.

I am &c
 (signed) WILLIAM COLENSO,
 Superintendent C.M. Press.”

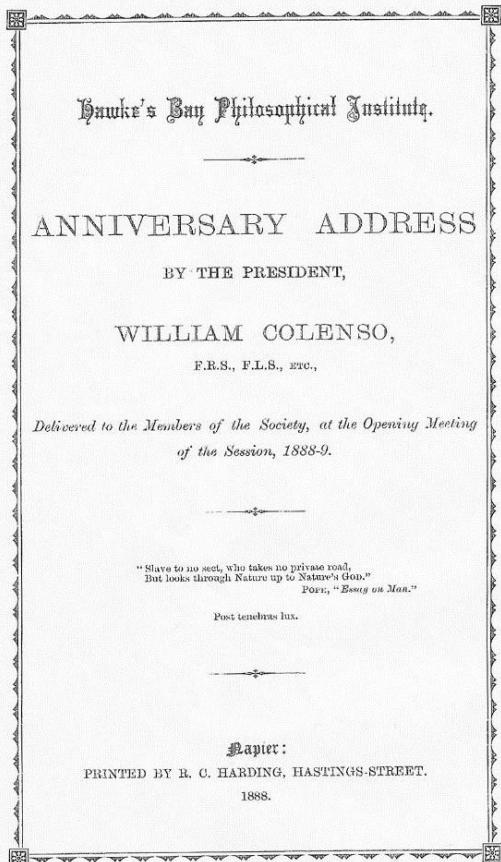
“Mr. R. Davis,
 Secretary, Northern District Committee.”



Harding, Printer, Napier.

**1888 Hawke's Bay Philosophical Institute:
Anniversary Address by the President,
William Colenso, F.R.S., F.L.S., ETC.**

With the President's Compliments.



Delivered to the Members of the Society, at the Opening Meeting of the Session, 1888-9

“Slave to no sect, who takes no private road,
But looks through Nature up to Nature’s GOD”

Post tenebras lux.⁴⁹⁴

LADIES AND GENTLEMEN,

Members of the Hawke’s Bay Philosophical Institute.

In my taking the President’s chair on this occasion, being the opening of our Sessional meetings for this year, 1888, I must, in the first place, thank you, for your having again unanimously elected me to this office. And while it is my pleasing duty to do this, and to assure you I will endeavour to do my best to fill it creditably,— I feel a certain amount of diffidential fear, lest I may fail, and so not come up to what you may have been led to anticipate; and this arises from many peculiar circumstances, which I need not particularize.

Aid here, *in limine*, before that I enter on my Address, in which I shall necessarily have to touch on many and diverse matters, I would beg permission to use the introductory words of a celebrated man of history (the Bishop of Hippo), as used by him nearly 1500 years ago

“Quisquis haec legit,
ubi pariter certus est, pergit tecum;
ubi pariter hæsitat, quærat tecum;

494 Light after darkness.

ubi errorem suum cognoscit, redeat ad me;
 ubi meum, revocet me. ”⁴⁹⁵

From the published Report of our Council for the last year's Session, which you have seen, I find there were 13 Papers on various subjects read here by Members of this auxiliary branch of the New Zealand Institute (luring that period. As the annual volume of “Transactions” published by the Institute has not yet been received by us, we do not at present know how many of those Papers may have been selected for publication in it; I hope, however, that our Society will shortly find, that, if not all, a fair proportionate number will have again passed their ordeal.

I confess, I would much rather have seen the expected annual volume of “Transactions”;—seeing, too, we are later than usual in opening our Session; as from it we should have learned the number, the variety, and the quality of its Papers—contributions from Members of the New Zealand Institute scattered throughout the Colony. And these Papers, or some of them, in brief review I might with pleasure now bring before you; just to show the working of the united society during the past year, and not unlikely serving to stimulate this branch of it to greater exertions.

495 Further let me ask of my reader, wherever, alike with myself, he is certain, there to go on with me; wherever, alike with myself, he hesitates, there to join with me in inquiring; wherever he recognises himself to be in error, there to return to me; wherever he recognises me to be so, there to call me back. St Augustine, De Trinitate I, III, 5.

I have also noticed in our Council's Report, just adverted to, that our Papers were not so many as during the previous Session of 1886,—though several of them were both long and important; this, I trust will not be the case during this year. I should like to see a much larger number of Papers, (even if some were to be shorter,) on the many and varied subjects which lie within the large and comprehensive range of our Society, as laid down in §1 of its Constitution:—viz.,

“The Institute is founded for the advancement of Science, Literature, and Art, as well as for the development of the resources of the Colony.”

Fairly considered, this embraces nearly (if not quite) all intelligent subjects: all that pertains to the nobler part of Man; all that makes life worth living for. There is scarcely a single subject throughout the long and wide range of philosophy, literature, philology, and general science—natural, technical, social, and inventive—but is free to us. Indeed, under our liberal Constitution, logically construed, it is hard to say what beneficial subject is excluded. I have heard it said, that Religion and Politics, speaking generally, were so shut out: but this I greatly doubt; that is, the real fundamentals of both,—or, what constitutes true Religion, and wholesome Politics: for certainly Science has (or will yet have) much to do with both; and with their aid the many resources of this great and rising Colony will be the better and earlier developed.

Some of you now present have heard me quote pertinent language from Sir J. Lubbock bearing on this subject; words which I would were engraved in brass or in

marble, or written in letters of gold and stuck up in the forum; words which I now again with pleasure repeat:—

“Every increase in Science—that is, in positive and ascertained knowledge—brings with it an elevation of Religion.... The immense services which Science has thus rendered to the cause of Religion and Humanity has not yet received the recognition which it deserves. Science is still regarded by many excellent, but narrow-minded, persons as hostile to religious truth; while, in fact, she is only opposed to religious error. The time is approaching when it will be generally perceived that, so far from Science being opposed to Religion, true Religion without Science is impossible.”—(*Origin of Civilisation*, p. 292.)

For my strong and growing belief is, that there is an eternal invisible golden or adamantine chain, extending alike through all, and continually and securely binding all together in their proper sequence for good: future times will show the truth of this. Now and then, here and there, a link of this chain is found, hit upon accidentally as it were, discovered (much as we daily hear of gold, and precious stones, and still more precious medicines,) by energetic ever-seeking ever-advancing man, for the common good of our race. And this, as I take it, is the essence and meaning of *true development*. Believing this, I as your President, would cordially invite you individually *to think for us*, and so to throw in your quota; to bear in mind that you are Members of this Society, and as such have each your common relative duties to perform; duties which cannot honourably be shirked; as Members you should contribute fairly from your mental stores, (whether, speaking figuratively, in

silver three-penny bits, or in golden sovereigns,) to the "Transactions," in Papers read here during this present Session on which we are now entering.

For there is yet another prominent feature in our last Report, in connection with the relatively fewer number of Papers read here during the Session of 1887, viz.,—the still greater paucity of their writers. This, however, should not be; as it throws the working of our ship upon a few hands only; and this, if continued, will surely bring about—not a mutiny, but the stoppage altogether of her sailing For, in my opinion, this branch of the New Zealand Institute will droop, and wither, and die, if it becomes unfruitful. The Ordinary Meetings will not continue to be held unless there are original Papers to bring before the Members; and if this should happen, and consequently no Papers from the Hawke's Bay auxiliary to appear in the annual volume, then the large number of Country and other Members, who, from their residing at a distance, are precluded from attending the Ordinary Meetings, will cease remaining subscribers. In this ship, or Hive, there should be no Drones. Our Society is both smaller and poorer than other kindred ones in this North Island—Auckland Wellington; happily there is no distinction made on this account; nevertheless we here in Hawke's Bay must feel it, and therefore it is the more imperative upon us, as a determined and devoted though small band, devoid of those large blessings which our elder sisters enjoy—in rich endowments,⁴⁹⁶ princely

496 WC: From the "Report of the Auckland Institute for 1887-8," just published, I gather their investments to amount to £10,366, and their receipts for the year to be nearly £1000.

gifts, resident learned scientific men, extensive libraries and museums,—to be active, to be penetrated with that genuine *esprit de corps*, which not unfrequently more than makes up for the want of everything else. In particular, let this very proper and praiseworthy spirit be shown in your attendance here on the regular nights of meeting; coming, too, in time for the fixed hour of opening, and also in the upholding the proper status of our young Society; I mean, the carrying-out all its standard Rules in their integrity, particularly Rule 3, which, I think, was too often infringed on during the last session. I mention this, as I have plainly perceived, that if care be not taken, our Ordinary Meetings are apt to degenerate into those of a low debating club; (*Facilis descensus Averni!*⁴⁹⁷) and so cease to remain an auxiliary branch of the New Zealand Institute, a society founded for a highly different purpose.

Moreover, this spirit is still the more needful, the more to be desired among us; when we consider our true position as an allowed intellectual Society, yet having no literate friends outside of us—if I may so speak. And this is certainly very sad, very different to what it should be ; widely different I believe, to what it would be in the Old Country; and this I say not merely with reference to ourselves, but mainly with reference to the rising generation. For it is of no use blinking the fact; endeavouring to construe what we see and know in a more charitable than true light; which, however estimable a feature at times, is sometimes the bane of both Societies

497 The descent of Avernus is easy. Virgil, *Aeneid*, VI. 126; ie, it is easy to slip into moral ruin.

and places. And it would ill become me, at my advanced age and with my experience, to speak from this Chair with bated breath on these important matters. About a month back I received a letter from a lover of Natural Science and a close working-student of Nature, who is also an old Member of the New Zealand Institute in which he laments the ignorance, and the apathy of the young folks of the present day towards scientific pursuits and subjects; remarking, that during his late travelling in New Zealand he had made it his practice to endeavour to find out such, in order to strengthen them; but that he was sorry to say he had not met with *one!*—and such, too, I may add, is my own sad experience here.—

And here, I think, I should inform the Members of our Society, that original Papers written by others than Members themselves may be received and read at our Ordinary Meetings: this has been frequently done at some of the meetings of the larger and older branches—as at Auckland, Wellington, and Canterbury, and that too with advantage to all parties: indeed some of those papers have been also published in the “Transactions.” Such papers, of course, must be introduced by a Member. It would be well for our Members to bear this liberal manner of acting in mind.—

The powerful and active enemies of Science and of general learning are—too great love of holidays and of idleness, of frivolity and of fleeting pleasures which yield no enduring satisfaction; which generally, if not invariably, look for more, never being satisfied, and mostly leaving “an aching void.” And should there be, before the final close, a few hours or days free from pain

and extreme weakness for reflection, then the sad heart-rending vista presents itself of time lost, of noble almost god-like faculties abused, of a wasted life! Our classical British poet, Thomson, might well exclaim, while meditating on such scenes:—

“Where now, ye lying vanities of life!
 Ye ever-tempting ever-cheating train!
 Where are you now? and what is your amount?
 Vexation, disappointment, and remorse.
 Sad, sickening thought! and yet deluded Man,
 A scene of crude disjointed visions past,
 And broken slumbers, rises still resolv'd,
 With new-flush'd hopes, to run the giddy round.”

(*Winter.*)

To speak more clearly, to bring matters home, there are at least three classes here among us who stand aloof rendering no aid! Such needful help is largely in their power to render; viz. 1, the Clergy; 2, the Principals and Head Teachers of our schools; and, 3, the Editors and Proprietors of our local Newspapers. As I take it, these all to a man should be found heartily aiding “Science Literature and Art,” if not enrolled under its banner. At Home, the Clergy generally (especially Ministers of the Established Churches in their respective parishes) are found so engaged; also, the Professors and Heads of the chief teaching establishments, whether in town or country; and the Editors of all respectable Papers are always on the look-out and ready to advance the great good cause for the real welfare of the people. But such unfortunately is not the case here, and that stigma rests more prominently on this third class, because they

controul the Daily Press—the most powerful engine of modern times for both good and evil. We, unfortunately, know from sad experience how truly careless our local Newspapers are with reference to us,—to our meetings, and to our read Papers; whereas, on the contrary, they might, if so inclined, render useful service, and be productive of much and lasting good.⁴⁹⁸ It matters not what the subjects of the Papers read may be; whether “dry” Natural History ones, or more popular and interesting ones relating to our District, of which (as I have often heard it said) many of their readers in Hawke’s Bay, and our Country Memmbers in particular, would rejoice to find even the mere outlines fairly given in the local News of the day. On the contrary, what do we find in them? Firstly, in importance, some Foreign amid Colonial telegrams, often interesting and of service, (for these, they, the Editors and Proprietors, have, and shall ever have my hearty thanks): but, secondly, what do we find? a horrid dissonant uncivilized semibarbarian lot! column after column; paper after paper; of most wretched information, composed of Races and their vicious belongings! Football and Cricket Matches (even those of schoolboys and Maoris!) *usque ad nauseam!* Inhuman Pigeon matches, at which tame birds issuing from a trap box are fired at, many wounded, a few killed! Fancy

498 WC: Here, however, I should state, in justice to the Evening News, that this paper did on several occasions give a pretty full and fair report of our meetings; this was owing to the kindness of Mr. Hardcastle, one of our active members, who was usually present and who wrote those reports for that paper, with which he was connected. At such times there was quite a run for extra copies.

Dress Balls; Lawn Tennis; Pugilistic encounters; Skating Rinks; Foot-race matches; illiterate rustic clownish holiday Pastimes; a legion of Theatrical performances in endless variety, regularly kept up with their standing exaltations in puffing—written, too, by the actors themselves! and so dressed up for the nonce, as if now the expressions of the audience themselves!! All making a continuous round of folly! leading to a complete dissipation of mind, and consequent loss of health morals and manners. In fact, to such an extent has this low craving after plays and pastimes, fun, frolic, frivolity and buffoonery been carried in this District, that it is almost an impossible thing to find a single Daily local without its News columns being more than half-filled with such trash!—

And when to all that is also added the low prurient *nouvellettes* with which those papers are further adorned; what wonder is it that “Larrikinism” (as it is called) should flourish as it does among us? Ever and anon we find the Editors of our Papers spasmodically muttering a weakly warning voice, against this insidiously increasing Colonial moral disease; but, I fear, they themselves, have yet to learn, that they are of its main causes, through their assiduously fostering all those things which encourage its wild and vicious growth. Such thoughtless doings seem to me, to be very much like the old Greek story of sowing the Dragon’s teeth! If our Papers judiciously and constantly led Public opinion to higher and better matters, instead of pandering to low and depraved tastes, things in general would be much better among us; honesty would show its face, and Society be generally advanced in its tastes and pursuits.

No doubt some of those gentlemen connected with the Press (should they hear of these words of mine), may say—and rightly say—“Your Natural History and general scientific Papers are dry reading, uninteresting to the popular mind.” No doubt of it: there is no royal road to learning. For, firstly, all beginnings are “dry” and distasteful; whether such be Euclid or Latin Grammar, or (to go down to the lowest rung of the ladder) A, B, C, first taught at the good mother’s knee; but the eye and the mind should be trained to patiently look for and follow after the certain reward:—and, secondly, crime has always been more exciting than honesty: the constable was never so picturesque an object as the highwayman: the brigand has from time immemorial been deemed a more romantic personage than the common soldier. The best critics agree that the most interesting character in Milton’s “Paradise Lost” is Satan. Why, in the great contest between right and wrong, between good and evil, between science arid ignorance, between light and darkness, which is always going on in this world, the low degenerate and evil principles should be allowed such odds in their favour is one of those mysteries which no one has yet solved. But so it is; yet why literate men (like those I have mentioned) should also join in supporting such, is to me a still greater mystery. I note, that the Prime Minister of England lately said at a grand Conservative Dinner in London:—“We have nothing sensational to offer, only advice based on scientific principles”; and so I may say, *mutatis mutandis*, speaking here from this Chair on behalf of our Society,—We have nothing sensational to offer, only facts, and truths, and advice based on scientific principles.—

I have gently indicated that (in my opinion) our Clergy, and our principal Teachers should be much more active in Natural History and Scientific matters; but then to do so effectually they must themselves have a love for such things. If they possessed this faculty and assiduously cultivated it, our Teachers might do a good deal among the more advanced science-loving pupils under their care, particularly in country places. Certain I am of there being untold unknown mines of ore among them, which only require to be worked; or, in other words, hidden minds of thought—living embryos shut up in their mental eggs, awaiting perchance some kind foster-parent to timely incubate and evolve them. Such an occupation, in my opinion, forms the more pleasing portion of the Teacher's duty or work; it is this especially that more fully comes up with the poet's thought, when he says,—

“Delightful task! to rear the tender thought,
To teach the young idea how to shoot,
To pour the fresh instruction o'er the mind,
To breathe th' enlivening spirit, and to fix
The generous purpose in the glowing breast.”

—THOMSON, *Spring.*

Scientific study should be largely inculcated, by kind and plain words, by Manuals, and by Example; for Science has extended into all portions of life. What I mean by a scientific education, is not the mere confined knowledge of that one branch taught, or thing brought more particularly under consideration, whether Euclid's problems or Natural Science—the science of living things,—as seen in the wondrous complex yet perfect and beautiful structure of a Fly, a Mussel, or a Moss;—for

Beauty's best in unregarded things;—the mention of which as a useful study is too often met with a *cui bono?* For the opinion is often expressed, that certain scientific pursuits are not compatible with the business pursuits of life. But there is no greater fallacy than this; as we may see in the living instances of many eminent men of our time. Sir J. Lubbock, for example, is one whose life disproves that charge; his scientific works, on Ants, Bees and Wasps, and other insects, are largely known, and it is hard to find a better man of business. And this notion or apprehension is not one of mere modern invention or conceit, although I fear it may have wonderfully increased of late years—even by “leaps and bounds,” owing to the great prevalence and power of Mammon-worship, especially here in the Colonies. Some of the Members present this evening may recollect two Papers “on Nomenclature,” read by me here about six years ago; in one of them I quoted some words of Sir J.E. Smith, the celebrated British Botanist, which seem to me to bear so intimately on this portion of my Address, and at the same time are so clear and simple, and pregnant with fine old English manly thought and feeling, that I venture to repeat them, (especially as those two papers were not published in the Transactions of the New Zealand Institute, being disallowed by the Editorial Board of Governors;) Sir J.E. Smith, writing sixty years ago, says:—

“We are no longer in the infancy of science,⁴⁹⁹ in which its utility, not having been proved, might be doubted, nor

499 WC: By “science” here, Sir J. B. Smith particularly means that of Botany.

is it for this that I contend. I have often alluded to its benefits as a mental exercise, nor can any study exceed in raising curiosity, gratifying a taste for beauty and ingenuity of contrivance, or sharpening the powers of discrimination. What then can be better adapted for young persons? The chief use of a great part of our education is no other than what I have just mentioned. The languages and the mathematics, however valuable in themselves when acquired, are even more so, as they train the youthful mind to thought and observation. To those whose minds and understandings are already formed, this study may be recommended, independently of all other considerations, as a rich source of innocent pleasure. Some people are ever inquiring, "What is the use" of any particular plant; by which they mean "What food or physic, or what materials for the painter or dyer does it afford?" They look on a beautiful flowery meadow with admiration, only in proportion as it affords nauseous drugs or salves. Others consider a Botanist with respect only as he may be able to teach them profitable improvement in tanning, or dyeing, by which they may quickly grow rich, and be then perhaps no longer of any use to mankind or themselves. They would permit their children to study Botany, only because it might possibly lead to professorships, or other lucrative preferment. These views are not blameable, but they are not the sole end of human existence. Is it not desirable to call the soul from the feverish agitation of worldly pursuits to the contemplation of Divine Wisdom in the beautiful economy of Nature? Is it not a privilege to walk with God in the garden of Creation, and hold converse with his Providence? If such elevated feelings do not lead to

the study of Nature, it cannot far be pursued without rewarding the student by exciting them."

—(Introduction to Botany, preface, 6th edition.)

Now what I mean by a scientific education is, the teaching of the power of observing; the teaching of accuracy; the difficulty of attaining to a real knowledge of the truth; and the methods by which one may pass from that which was proved, to the thought of that which was also capable of being proved. The first thing to learn is the power of observing, the power of seeing things in their relations to other things, and the modifications they might undergo; this, though a difficult thing, is attainable. Science teaches not only how to observe, but how to record facts, and how to arrive at general conclusions upon facts. The habit of accuracy which Science inculcates, makes a man accurate in the ordinary business and pursuits of life. There are many people—good people who would not tell a lie, but for their lives they seem as if they could not tell the exact truth. Now science teaches the difficulty of attaining truth, and shows how to arrive at it. It is said of the celebrated John Hunter, who delighted in plain language, that he once said,—If he wished to sum up his advice to students, it would be, "Don't think; try." What he meant was,—When one was satisfied about certain principles, do not think that you can think what must necessarily follow, but try test experiment, observe, record facts; then you would see whether what you thought was true was really true.

I hope a better day is at hand for our Government Schools; when Education Boards (if existing), or Committees (when formed of proper literate men), will

pay full attention to this one great qualification or main desideratum on the part of Teachers seeking situations: viz, their love for Natural Science and for Scientific study, and their aptness to teach such, both out of school as well as in school. Such a Teacher in a Country School would prove a real blessing to the youths under his care; while Teachers who are patrons and supporters of Racing, with its attendant evils,—betting, gambling, lying, and general dissipation,—(whatever their scholastic attainments might be,)—should be set aside; as, also, all who are smokers during school hours: for example is always more powerful than precept. And here I may remark, that it has ever appeared strange to me, that none of our many Teachers seem to be inclined this way—towards the Natural Sciences, though otherwise well-fitted for their honourable posts; seeing, too, that their worthy Inspector of Schools, to whom this Society is so largely indebted, has from the beginning set them such a good example.⁵⁰⁰

And just so it should be with our working Clergy; especially, too, as so many of them have often been so loud in their denunciations of our “Godless Schools,”—as they are pleased to term the Government Schools of the Colony. Do they and their Sunday-School Teachers ever reflect on the utter incongruity of some of their teaching with the certain light of Science? Take, for instance, a single concrete example, of almost constant recurrence, in their Sunday Services, and in their Sunday Schools in teaching their Catechisms,—I mean the Fourth Commandment. And here I would prefer using the

500 Henry Hill.

words of a favourite clerical author of mine, a high Church dignitary, the late universally respected Dean of Westminster; writing on this Commandment, he says,—

“We cannot be called, as in Exodus, to remember that the earth was made in six days, for we most of us know that it took not six days but millions of ages to bring the Earth from its void and formless state to its present condition. The letter of the Fourth Commandment has long ceased.”—(*Christian Institutions*, p. 342.)

I need not to dilate on this: for if the children are taught the letter only as infallible truth, the time is sure to come when they will know of its error, and then mark the certain consequences which must follow; for the law controlling the mind of man when set to work, is much like that of machinery—the strength of the strongest is that of its weakest part.—

My mentioning the Clergy, serves to remind me of an account of the opening by the Primate of England of the new Oxford Hall Bethnal Green, London; received by the last mail from England, which has greatly pleased me. This new hall is an addition to Oxford House, an institution founded by Oxford men for the social elevation of the working-classes, and in connection with it are four working-men’s clubs. The new hall is capable of accommodating 900 persons, and has been erected at a cost of £1100. The Archbishop made several good and homely telling remarks; among others

—“that the two real evils of Bethnal Green, were Drunkenness, and early reckless marriages. Drunkenness was an offence against all mankind, and early reckless marriages were offences almost as great. In his own part

of London it almost made his blood run cold to think of the many early marriages. Sometimes he heard in Lambeth Church on a Sunday morning the lists read out of asking So-and-so, and there was an enormous number of minors, who did not think it any harm, with no means in the world, to set up, and begin to bring a family into the world. Self-restraint was the road which governed both kinds of intemperance,” &c.

I the more readily quote this excellent observation made by the Primate, as it is of equal value here in this Colony, where “self-restraint” from all intemperate and vain pleasures is so greatly needed, and where, I fear, those “early reckless marriages” are also too often made.

If the question were to be put to me,—which has been not unfrequently asked of aged persons who had seen a little more than usual of life, on their reaching the confines between the two worlds in full possession of their faculties, and with the illimitable full in view,—“What I considered the very best thing for man?”

Speaking from experience I should reply, “*Love of Work.*” Work, employment, whether mental or physical; or better still (where such can be) both; both combined as it were in a pair, arid so helping one another. And here, please, note, I do not dogmatically lay down what kind of work is to be followed: No; I would, I must, leave that entirely to the idiosyncrasy of the individual. Take up and follow that to which you are more naturally inclined, only let it be work,—real application; endeavour to master it. It is said of the Prince of Wales, that on one occasion, in speaking in public, he said,—“Whatever is worth doing is worth doing well.” And it is also recorded

of John Wesley, that he had said,— “If I were a shoemaker, I would try to become the best shoemaker in the parish.” But no doubt, both these sayings, or the truisms inculcated by them, are not original. Knowledge is really happiness; a man who has a fair share would not give it up for anything he could see; and it is admirably fitted to supply satisfaction to those powers of the mind which otherwise have a tendency to drift into mischief. Here, methinks, the words of one of our esteemed British bards are very applicable:—

—For “it has peace, and much secures the mind
 From all assaults of evil, proving still
 A faithful barrier, not o’erleap’d with ease
 By vicious custom, raging uncontroll’d
 Abroad, and desolating public life.”

—COWPER: *Task*, b. iii.

That, also, is a delightful little poem of our British poet *Byrd*,—made in 1588, (300 years ago,)—beginning with,

“My mind to me a kingdom is.”—

—This I have often repeated aloud, with much depth of thankful feelings, when alone (yet *not* alone!) in the deep recesses of our ancient forests—surrounded by the manifold and wondrous beauties of Nature.

Moreover, scientific processes also gratify our love of novelty, of wonder;—all have an insatiable appetite for the wonderful; civilized man is still, everywhere like the Athenians of old, eagerly enquiring after “some new thing.” And to a certain extent (if, indeed, such should ever be limited,) this common trait is conducive of great

good, as, in spite of many failures, it continually leads to the advancement of our race.

When Dr. Johnson was once asked, “What books he would select for a boy’s reading?” He replied, “I would let him go into a well-stored library and select for himself.” That was good: but, please remember, a library in those days and a library now, (that is, say, such as this Public one here in this building of the Athenæum!) are two widely different things. At that time, light reading, novels and romances were very few indeed; they may be counted on one’s fingers, and were generally of a select class, such as are still called “the British Classics”; whereas now, every common library, every reading room is inundated with them as with a flood—“the very spawn of Nile”; and the depraved modern taste, I regret to say, goes madly after them, and too frequently the very lowest. There is yet another important branch of scientific teaching which I should also like to say a few words on, viz, Technical Science. This of late has come largely to the fore, and very properly assumed a first place at Home; much having been said in its behalf by powerful and talented speakers. Indeed, its absolute necessity is clearly shown, if our British nation is to continue to hold its own among the other civilized states of the world; and this, as I view it, is a fair fruit of the National Exhibitions of the last half-century, one of which is now about to be held in Melbourne, and if such teaching is needed at Home, it is still more needed here in this new country. I have very lately been reading in “General Gordon’s letters to his Sister,” and among them is a short one bearing, and that quaintly yet truly, on this subject; a portion of it I extract, as I fully support it,

having myself had to do in this country, some 40-54 years ago, many of those very things so feelingly mentioned by Gordon; and which, at first, I felt very stupid about: but *patientia docet*. Gordon says

"If I had sons I certainly would teach them a little of most trades—amongst others, bootmaking. You have no idea how feeble one feels not knowing these things. People in our position of life must see the time has gone past for sinecure posts; that their sons, or grandsons, at any rate, must be prepared for the Colonies. What a number of useless boys there are, who cannot even write a good hand (I can't, I know). I had a signal failure with my repairs on my boots to-day. A little carpentering, black- and tinsmithing, shoemaking, and tailoring, would be a real gift to a young man; he would be prouder of himself, feeling, 'Let the worst come to the worst, I am not useless.'⁵⁰¹ I declare I feel for the poor little chaps of the future, if we give the A B C education we do now. Large schools are, to most boys, not an advantage, but the reverse. What earthly use will the Latin, Greek, or Algebra be to thousands who have learnt, and probably, forgotten, them. Looking at many one knows, they never need have learnt more than reading, writing, arithmetic, history, and geography. A disastrous war would close the Army, except to strong men who were soldiers only. It seems cowardly to say it, but I am glad I was born when I

501 WC: This practical remark of Gordon's reminds me of an ancient Maori proverb:—"He kai kei aku ringaringa": meaning, I can earn my livelihood by my own hands—my own exertions or industry, Lit., I have food in my bands—or, in the use of my hands. The proud saying of an industrious people; the very opposite of an idle person and "loafer."

was. I imagine six months would give a boy a good insight into all trades, sufficient to let him carry on any one with ease if he chose to pursue it in after years."

Here I will also quote a few highly suitable sentences on this subject from an oration delivered by Professor Tyndall, at his banquet (of which, more further on);—he said:—

"I was called on to deliver a series of lectures on scientific education. I then referred with serious emphasis to the workers in our coal mines, and to the terrible perils of their occupation. I pointed to the intellectual Samsons toiling with closed eyes in the mills and forges of Manchester and Birmingham; and I said,— 'Give these toilers sight by the teachings of Science, and you diminish the causes of calamity, multiply the chances of discovery, and widen the prospect of national advancement,' Thus early, you will see, I was alive to the importance of technical Education, and I am no less alive to it now." &c., &c.

Since writing the foregoing,⁵⁰² I have been reading the Rectorial Address lately delivered by Mr Goschen as Lord Rector of Aberdeen University to the students there; and I have been both struck by and pleased with it. And it seems so beneficial and suitable to the present time, (both here as well as there,) and also so much in unison with

502 WC: This Paper was mainly written while at Dannevirke, in May, confined to house through rain; hence, this, from Mr Goschen's Address, was extracted and added after my return to Napier, in June.

my own observations I have just given to you, that I extract a small portion of it. Mr. Goschen said

“He wished to plead, not for any particular branch of knowledge, but for a temper, an intellectual habit, an attitude of mind, which was applicable to every kind of study, and, indeed, to every sort of work—the habit of intellectual interest in all that was studied, learned, or done. Without intellectual interest no study, no profession, no business could be satisfactorily carried on, Intellectual interest sprang from the work itself, and was born of doing it, and was not the interest of success, rivalry, profit, or duty.”

Having spoken approvingly of the devotedness of many engaged in the professions of Law and of Medicine; he went on to say

“It might be said that these were learned professions.... His contention was that the same truth held good with regard to callings which were commonly considered the least intellectual. He would take an illustration from a very prominent controversy of the present day. Many of our commercial cities were at this moment terribly exercised by the fact that foreigners are ousting Englishmen in our counting-houses at home, and in the competition for new trades abroad, German clerks, it was said, were invading every business house in London, and depriving Englishmen of their bread; and the reason was said to be their greater knowledge, their command of foreign languages, their acquaintance with all the technicalities of their business, and the excellence of their Commercial Schools. Conferences had been held to consider the cause of English failure, and remedies had

been suggested in plenty to meet an admitted danger. Foreign languages were to be more and more introduced into our Educational system. English clerks were to have a special business training; higher commercial schools were to be founded to produce an article capable of competing with the foreign importation. He would not throw one drop of cold water on any one of these projects, all of which had evidently become necessary and all of which should be pushed with ardour and enthusiasm. But when they had done all this,—had taught the English clerk five languages, had instructed him in the technicalities of his business, they would not have done enough unless they had succeeded in making him as fond of his work as his German competitor (hear, hear). There was a danger in thinking that it was only knowledge that was lacking, that it was only in width of information that the foreigner was superior. He knew more, no doubt; but that was not the root of the matter. The root of the matter was, that he cared more about his work; that, as a rule, he took an interest in it apart from its results in money; which, for whatever reason, the Englishman had not hitherto learned sufficiently to take. Of course he was speaking in very general terms; but he pointed to the admitted fact, that it was characteristic of the German clerk that his work presented to him a field which excited his interest and filled him with an ambition for wider knowledge, which was not to be despised because its subject seemed dull and dry. The man who, however instructed, mentally swore at the work to which he was condemned, who regarded it as drudgery to be done from necessity or from a sense of duty; but to be got over as soon as possible and forgotten, was at a

disadvantage in competing with the man to whom that work was constantly suggesting topics of interest, and to whom it was therefore not a drudgery but a pleasure (hear, hear). He had seen German clerks listening to some discussion on a complicated question of commercial law, not with the bored faces of men who kept their eye upon the clock, anxious only to know when the hour of release would strike, but with the keen interest of experts who delighted in the analysis of an intellectual problem. Such interest could not be explained away by putting it down to the mere instinct of money-grubbing. No thought of salary was present to the minds of those salaried men. Over such discussion the dinner-hour would be forgotten.... He hoped his hearers would not misunderstand him: he was analysing a type of character, not holding up an ideal. From a different point of view the English clerk would be the more attractive man. In loyal devotion to the interests of his employers, he had certainly no superior. He had natural quickness, he had energy when called upon for special duty. He had many interests beyond the counting-house or the warehouse, and if, when the hour of his release had come, he hurried off to ride his bicycle, or to strip for the river, or to carry his bag to some suburban cricket-field, or made his way quickly to his wife and children at home—who should say one word of blame? But, as a man of business, the rival to whom his work was not a mere task, who got rid of it with less alacrity, who found pleasure in it as well as outside it, would beat him in the race.”—(London, “Standard,” Feb. 1, 1888.)

Before that I conclude this part of my Address I would also remark, (having had a hand in forming this Society,

and in drawing-up our Constitution and Rules,) that if I had to begin again, I would certainly seek to have at least one other additional rule added to our present number, viz.,—that every Member should contribute annually at least one original Paper, or five good specimens to the Museum, or two suitable books to the Library. Indeed, and for my part, (speaking experimentally, as long being the Honorary Secretary and Treasurer of this Society,) I would much rather receive an original Paper from a Member than his guinea annual subscription,—but better still both.

No doubt Members will have noticed with much satisfaction, the large number of specimens both Natural and Artificial that have been added to the Museum of the Society during the past year. Time will not permit of my speaking of them particularly, and there is the less need of my doing so, as they are all here present, more or less patent, to speak for themselves. I would, however, say a few words of congratulation respecting the discovery of such a large number of valuable Moa bones in this almost immediate District; nothing approaching this had hitherto been met with in the North Island. These as you know, were all obtained by our zealous Curator⁵⁰³ from one spot near Patangata, all more or less huddled together; and of them, I dare say, he will give a full and particular account during the Session.

Such a very large and unexpected accession of varied specimens, as mentioned in the Report, many of them, too, being very valuable, naturally leads me to remark on our great want of room for displaying them to advantage,

503 Augustus Hamilton.

as well as their insecurity from fire. This subject has been touched on by the late Council in their Report,—I was going to say, almost ironically! I wish I could see an early remedy for this,—or even a future one: but I must confess, I do not. And I, for my part, feel this perhaps the more keenly, knowing, as I do, that things might have been different with our Society in this respect, had it not been for the waywardness or shortsightedness (to give it no worse name) of the officebearers for the time being of the Athenæum, (under whose controul was this building and its adjacent grounds,) who opposed what then might have been usefully and beneficially accomplished. I much fear that such a chance may not again happen.

And here, bearing in mind our already confined and over crowded room, and our scanty and uncertain monetary resources, and our present unpleasant state of finance,—I would remark, that it may be found advisable strictly to limit all future outlay in the procuring of specimens for the Museum to those of the Colony only, especially those of the old Maoris, to which may be added the genuine artificial productions of ancient Polynesia generally; leaving the Natural History specimens, including those of this Country, (especially of the animal kingdom,) which are much more common and always more easily obtainable, to a future and more prosperous time.

I should like to take a rapid glance of the principal achievements of Science during the past year, and to lay them before you; but such would prove a hopeless task, even if I had attempted it at the beginning of my address, and confined myself solely to it. For while she has been as busy as ever, and very many things heretofore hidden have been made known, and utilized, and perfected, still

the year 1887 has not been noted for any remarkable or great discovery. But, in so saying, I must not forget that the past year was the marked Jubilee Year of our most gracious Queen. And here I cannot do better than to quote from a most excellent lucid and learned scientific oration, delivered by Professor Tyndall, at the complimentary dinner given on his retirement from the Chair of Natural Philosophy at the Royal Institution; the President of the Royal Society in the Chair. Professor Tyndall, after premising that this was the Jubilee Year, and asking, what would be a handsome Jubilee present to offer the Queen, went on to say

"It would be a handsome Jubilee present, if it were possible to roll up the career of Faraday into portable form and to offer it to the Queen as the achievement of one of her Majesty's devoted subjects during her own reign. But passing beyond the limitations of the individual, what was Science, as a whole, able to offer on the golden wedding of the Queen with her people? A present of the principle of gravitation—a handing over to her Majesty of the bit and bridle whereby the compelling intellect of Newton brought the solar system under the yoke of physical laws—would surely be a handsome offering (loud cheers). He mentioned this case of known and conspicuous grandeur, in order to fix the value of another generalisation which the science of her reign could proudly offer to the Queen, quite fit to take rank with the principle of gravitation—more momentous if that were possible—was that law of Conservation which combined the energies of the material universe into an organic whole—that law which enables the eye of Science to follow the flying shuttles of the universal

power, as it weaved what the Earth Spirit in Faust called “the living garment of God” (cheers). This, then, was the largest flower of the garland which the Science of the last fifty years was able to offer to the Queen. The second generalisation was like unto the first in point of importance, though very unlike as regards its reception by the world. For, whereas the principle of Conservation, with all its far-reaching, and from some points of view, tremendous implications, slid quietly into acceptance, its successor evoked the thunder-peals which it was said always accompany the marriage of thought and fact. For a long time the scent of danger was in the air. But the evil odour had passed away; the air was fresher than before; it filled our lungs and purified our blood, and Science, in its Jubilee offering to the Queen, was able to add to the law of Conservation the principle of Evolution.”—

During the past year much has not been done in the way of fresh geographical discovery. The unexplored portions of the globe are becoming so rapidly contracted that we can scarcely reasonably expect great discoveries from the modern traveller. Central Asia and Africa however, are still the scenes of various geographical labours. Little has been done in high Northern latitudes; but our knowledge of the Siberian islands has been considerably increased; and the Antarctic regions are again coming to the fore, and claiming notice; though I, for my part, bearing in mind the former Expeditions, both American and English, of nearly half-a-century ago, (having, also, myself, visited the ships when at anchor in the Bay of Islands, and made the acquaintance of their officers,) I have not any high opinion, or expectations of discovery in that direction.

The past year, however, was fruitful in additions to our previous knowledge of the planetary bodies, the former total of 260 being increased to 271. The Solar Eclipse of August 19th, owing to bad weather, yielded poor and scanty results, which, I believe, are still unsettled; and the results of the transit of Venus in 1882 are only lately published; they give a value for the solar parallax corresponding to a distance from the earth of 92,560,000 miles. Several new variable stars have also been discovered; and about 21 which Flamsteed described, but which Bailey, being unable to identify them, imagined to have disappeared from the heavens, have now been identified by Peters. Probably it will be admitted that one of the most striking scientific events of the year has been the announcement by the well-known astronomer Mr. Norman Lockyer of his meteoric theory of the structure of the universe. Whether it will supersede the nebular hypothesis, which has held the field so long, remains to be seen. Mr. Lockyer's theory displaces the nebula from its position of cosmical parent, and gives that honour to the meteorite. It is only recently that astronomers have arrived at an approximate idea of the enormous number of these wandering bodies, and it is obvious that they play a much more important part than was at first supposed. His theory has the merit of simplicity, and it would seem to offer a reasonable explanation for many of the phenomena of the universe. Whether it will hold its ground in the light of subsequent research, or whether it will fall into the limbo of untenable and exploded hypotheses, time alone can shew. The photographing of the sky by International arrangement is proceeding apace, and when completed will prove to be a most valuable

acquisition. Photography has not yet solved the problem of “taking pictures in colours,” although the announcement of it has again been made. The Astronomical Congress at Paris was a noteworthy scientific event of the past year, leading as it did to more organized action in searching the heavens among astronomers in all parts of the world. Ignorant people have been very much excited, and have written much nonsense, because Venus has been appearing as a morning star with more than her usual splendour. There has been much foolish talk about the “Star of Bethlehem” in connexion therewith, showing how much remains to be done before even the most elementary knowledge of common things become generally diffused. There is yet another fact gleaned from Meteorology I should also like to mention; as I think it will be found to bear upon what we have often of late years found to be the case here, and that, too, increasingly—I mean the cause of drought. Hitherto the theory of Wells, that dew is condensed out of the air near the surface of the earth has been universally received; but, after an extensive series of experiments and observations, Aitken has arrived at the conclusion, that it comes out of the ground: a theory, however, which is not quite new, as it had been already indicated.

In Chemistry the event that has interested the public most during the year has, no doubt, been the synthesis of glucose (the manufacture of the principle of grape sugar) by Fischer and Tafel. A great deal has been done in synthetic chemistry during recent years, and people have been fearful enough to prophesy the ruin of the sugar industry all over the world. There is little danger of that,

even if the new substance could be manufactured in sufficient quantity; for whatever purposes it may be used, we are likely to go on sweetening our tea and coffee with the produce of the cane or beet. Saccharin (as this new substance is called), is from 180 to 300 times sweeter than sugar, and is now being made on a commercial scale from Coal Tar; its present advertised retail price is 5/- an ounce, and for medical purposes it is very valuable. A natural poison, named Tyro-toxicon, producing nausea, vomiting, and purging, has also been obtained by Mr. Vaughan from cheese and ice-cream; and while the knowledge of this produces a kind of fear, it may also prove salutary in more ways than one. Microbes—of various names, and of almost as varied direful import—are still the subject of research; Dr. Klein affirms, that he has discovered the germs of Scarlet fever in the *Micrococcus scarlatinæ* of diseased milk; and then there is the bacillus of Cancer, of which so very much has lately been said in the telegrams and papers of the day. It is, however, more agreeable to have to note, that a Bavarian chemist has confirmed the experiments of Crookes, Odling, and Tidy, in which they found that disease-producing microbes quickly perish in water, so that the danger from that source is not so great as was at one time believed.

In Physiographical Science, one or two things may be noticed, though their causes are still obscure. One is, that the curious Seiches, or oscillations, of lakes, hitherto noticed in Switzerland, are now recorded from Lake George in New South Wales. Another is, that of Earthquakes, (which we here in this country know a little of,) their causes seem to differ in different places,

though, as a general rule, the contraction of the earth's crust to accommodate itself to the shrinking of the nucleus on which it rests, is said to afford the most reasonable explanation of its tremors. Thousands of new fossils are constantly being disinterred all over the globe, all interesting and none of them (as far as I know) yet affording any facts against the current views; our local and colonial Geologists contributing their fair share to those discoveries.

In Botany, Zoology, and general Biology much work has been done, all tending towards filling-up the links still wanting in the one great chain of Nature; of which (and of Botany in particular) more anon.— In General Physics there is not a great deal of novelty to note. The applications of Electricity are increasing, and it is said, that before long there will be Telephonic connection between London and Paris, it being now possible to send speech through water. As an apt illustration of the power of Knowledge the Telegraph wires stand pre-eminent, along which unheard and unseen conversations are going-on! The Phonograph is being utilized by the "phonograms" of a conversation; that is, the little sheets of foil on which the records of the sounds received have been imprinted, these are put back into the apparatus, and the *ipsissima verba* and tones of a conversation reproduced as often as may be necessary. These phonograms are practically indestructible, and may be sent by post as easily and as cheaply as a letter.

Electricity being one of the most prominent (if not the very prominent one) of our useful modern scientific discoveries,— under its present beneficial threefold aspects of Telegraphy, Telephony, and Electric Light, are

now in use in this town, (with more excellent uses of this potent power yet to come!) I will just quote a few words from the conclusion of the very interesting inaugural Address of the President of the Society of Telegraph Engineers and Electricians, Mr. Edward Graves, the Engineer in Chief to the London General Post-Office, at a Meeting held at the Institution of Civil Engineers, Westminster, in the early part of this year (1888). He, naturally, selected Electricity for the subject of his discourse, and enumerated the various directions in which the electric force is utilised, such as Telegraphy, Telephony, and Electric Lighting. He said

“They had a grand total of 42,368 persons engaged in this country in industries relating directly to electricity. Adding to these the individuals that could not be classified, who must amount in the aggregate to at least an equal number, they arrived at a total approaching 100,000 persons, in round numbers. The employment of 100,000 persons meant the support of at least 800,000 of the community. If these figures represented even an approach to the truth, it was evident that throughout the earth there must be 5,000,000 of people, at least, who would have to seek for other means of subsistence if electricity and its commercial applications had not been made known to man. Thus it was evident that a double blessing had been conferred by the discovery of its potent force—a blessing to the inhabitants of the world at large, who profited by its operations, and a further blessing to the toiling myriads whose field of labour lay in carrying them out”

And now another novel discovery in Electricity is reported, viz., that of purifying London Sewage. The plan

has been devised by Mr. W. Webster, F.C.S., and a long and interesting account of it has been given, from which it appears, that a current of electricity, produced either from cells or from a dynamo, is sent into the sewage, the transmission being effected through metallic electrodes; and thus the chemicals required are created in the sewage itself by the action of the electric current on the electrodes and the sewage, and the effect is curious and prompt, Mr. Webster has already carried out his plan, which he has patented, beyond the bounds of his laboratory.—

I have already alluded to Botany (my favourite Natural Science,) with a remark that I should return to it; I now do so, with great pleasure, as I wish to call your particular attention to the very high honour lately done to our chief New Zealand Botanist (for such I may truly style him) Sir Joseph Dalton Hooker, whose descriptions of New Zealand plants, also of the plants of Tasmania, Cape Horn, Fuegia, the Falklands, and the furthest Antarctic Islets, collected, too, by himself, together with his celebrated writings on Southern Botany in general, are on our Library shelves, and are well-known to many of you. Sir J.D. Hooker, then a very young man, was the Botanist and Naturalist, (and assistant Surgeon) of Sir J. Ross' Antarctic Expedition, already mentioned by me. The Royal Society held their anniversary meeting at the close of the last year in their apartments in Burlington House, London, when the anniversary address was delivered by the President, Professor G.G. Stokes, M.P., from which I must be permitted to give you a rather long but very interesting very satisfactory extract; and I do this the more readily, believing in the truth of the ancient

saying or fable,⁵⁰⁴ with which you I think, will also readily concur. At the opening, the President,—having first feelingly mentioned the decease of one of their Fellows, another of our New Zealand Scientists, Sir Julius von Haast, (a member of the New Zealand Institute, and well-known to many of us,) he having been “so lately among them in London, apparently in full vigour, and now this distinguished Geologist and Naturalist is no more!”—informed the Fellows, that

“the Copley medal⁵⁰⁵ for the year has been awarded to the eminent Botanist, your former President, Sir Joseph Dalton Hooker, K.C.S.I. It is impossible, within the limits to which I must confine myself on the present occasion, to do more than briefly refer to some of the more salient features of his scientific career, extending as it does over nearly half-a-century of unceasing intellectual activity; and I need hardly say that in attempting to give some idea of important labours which lie outside my own studies I am dependent on the kindness of scientific friends. As a traveller he can, perhaps, only compare with Humboldt in the extent to which he has used travel as an instrument of research. To quote a remark by Professor Asa Gray, “No Botanist of

504 WC: I allude to the fable of “the body and its members,” in the story of Menenius Agrippa and the revolting plebeians of Rome, as related by Livy, *lib.* ii., c. 32.

505 WC: This gold medal is the highest prize annually awarded by the Royal Society. When (sixtythree years ago) the Copley medal was awarded to Arago, Sir H. Davy, the President, in presenting it, said, that “Science, like that Nature to which it belongs, is neither limited by time nor space. It belongs to the world, and is of no country and no age.”

the present century, perhaps of any time, has seen more of the earth's vegetation under natural conditions." His Antarctic voyage in 1889-48 supplied the material for a series of well-known works of first-rate importance on the vegetation of the southern hemisphere; and these, in their turn, formed the basis of important general discussions. The journey to India in 1847-51 yielded, in the Himalayan journals, as Humboldt has remarked, "a perfect treasure of important observations." The maps made of the passes into Tibet are even still unsuperseded. The fine work on the "Sikkim Rhododendrons" was at once a revelation to the botanist and to the horticulturist. His account of the glacial phenomena of the Himalayas supplied facts both to Darwin and to Lyell. A journey to Morocco in 1871, and a later visit to North America, led to important conclusions on plant distribution. Perhaps Sir Joseph Hooker's most important place in scientific history will be found in the rational basis upon which he placed geographical botany. De Candolle, while admitting the continuity of existing floras with those preceding them in time, still adhered in principle to the multiple origin of species. To quote a remark by Professor Asa Gray—"De Candolle's great work closed one epoch in the history of the subject, and Hooker's name is the first that appeals in the ensuing one."

According to Lyell, "the abandonment of the old received doctrine of the 'immutability of species' was accelerated in England by the appearance in 1859 of Dr. Hooker's 'Essay on the Flora of Australia.'" This essay effected a revolution. It was quickly followed in 1860, by the classical essay on the "Distribution of Arctic plants;" and in 1866, by the Nottingham lecture on insular floras. The

fact of widely dissevered localities for species, which De Candolle found an insuperable obstacle to abandoning the doctrine of multiple origin, has, in the hands of Hooker and A. Gray (as stated by Bentham), afforded the most convincing proof of the genetic relationship of the floras of which such species are components. In systematic botany Hooker has, perhaps, no rival since Robert Brown. "The Genera Plantarum," the joint work of himself and his friend Bentham, and the "Flora Indica," to the completion of which our colleague is devoting the leisure of a well-earned retirement, form only as it were the head of an immense body of taxonomic memoirs. Nor have his services to botanical science been confined to geographical botany and to taxonomy. His researches on various groups, such as Welwitschia and others, deal in a masterly way with morphological problems of the highest interest and of extreme difficulty. While no one would attempt to minimize the commanding and unique position of Mr. Darwin, the scientific historian of the future will recognize how much the development of the modern theory of Evolution, from its first conception in the mind of Mr. Darwin, was facilitated by the interaction upon one another of the work and minds of Darwin, Hooker, and Lyell. It was due to the earnest efforts of his two friends that Mr. Darwin was induced to publish the first sketch of the Origin of Species at all. And no one, had he been alive, would have more cordially recognized than Mr. Darwin, how vast an armoury of facts the wide botanical experience of Hooker constantly placed at his disposal in fortifying and supporting his main position."—

I can assure you, Ladies and Gentlemen, it was with the utmost possible pleasurable feelings that I read the able address of Professor Stokes, containing those words I have extracted for you, while away up in the forests, surrounded as I then was with Nature's living Botanical children;—those very trees and shrubs, Ferns and Mosses of Hooker's own classifying and naming, describing and drawing. All, I fancied, joining in expressive though mute unison with my feelings, and so invigorating me, causing me to drink in the more deeply from the spirit of the woodland scenes. Moreover: on my return to Napier, all that was renewed on my finding here the one thing wanting to fully complete my joy, viz., the reply of Sir J.D. Hooker on that memorable occasion; this had been privately printed and a copy kindly sent out to me. From his plain and feeling and hearty response I will now give you the last paragraph in Sir Joseph's own words; which are worthy of the man, and go far to support much of what I have this night read to you in the early part of my Address.—

"Mr. President, I have exceeded all bounds already; but if I may be allowed a few minutes longer, I would, taking advantage of the patriarchal age which your Treasurer has assigned to me, say a few words for the encouragement of the younger scientific men here present. A septuagenarian may indulge in introspection; indeed it comes natural to him to do so; and when I heard of the award of the Copley Medal to me I could not but ask myself to what quality or exceptional condition of mind I could attribute it, that I had attained to so unique an honour. Heredity, early training, advantages, opportunities, experiences, and even research itself are

fruitless, *if there is not some inward motive power to compel us to exercise our faculties, and some inward heat, some fervour, to ripen the fruits of our labours.*—I can truly say that I am conscious of no genius, exceptional powers, or talent; but I have a talent, and it is one that is possessed by every one in this room, and by many I hope in greater measure than I possess it. It is not talent in the modern meaning of the word, but in the old French meaning of wish or will; and I cannot better express the sense in which I possess it, and you all possess it, than in the words of a very modest motto adopted for his rule in life, by a very great man, who died four hundred years ago—Prince Henry of Portugal, the Father of Navigation and Patron of Navigators, who chose for his motto '*Talent de bien faire,*'—‘the wish to do well.’ *To such as have this wish, and will use it with all their might, even a Copley Medal is attainable.*”

Here I may, also, briefly mention what some of our members, zealous naturalists, have done during the past year, in again collecting more of our New Zealand novelties from distant and little-known parts in the interior,—as from Mount Tongariro,⁵⁰⁶ Ruatahuna,⁵⁰⁷ and elsewhere; descriptions of many of these, will, I trust, be found in this year’s annual volume of the New Zealand Institute “Transactions.”

There are several other important subjects I should much like to touch upon, but time presses. One, however, I must select and say a few words on, as a branch of it I am (or, may I say? we are) particularly interested in,—I

506 Henry Hill and William Collie sent specimens from Tongariro.

507 Augustus Hamilton sent specimens from Ruatahuna.

mean the subject of Philology; and the one branch in particular the great Polynesian one. Here we have a language,—or shall I more correctly say, the remains or debris of one?—that extends over one-tenth of the whole globe! A pure (i.e. simple, unmixed,) indigenous islands language, grammatically spoken in numerous dialects, yet all originally springing from one root.⁵⁰⁸ If we look around us here in this very room, we shall see much of food for the thoughtful mind concerning the ancient aboriginal inhabitants of this and other Polynesian Islands, showing what those people once were; although we, through force of circumstances beyond our controul, have only come in late as it were, for the very rejectamenta—the scraps and leavings of the great feast. But while these mute objects tell their dumb tale, what of

508 WC: "It is an astonishing fact, and one worthy of close attention from future philologists, that the Polynesian language, of which the Maori or New Zealand is a branch dialect, is commonly spoken by people scattered over one-tenth of the whole globe! Throughout an Island area, containing 80 degrees of latitude and 70 degrees of longitude,—from the South Island of the New Zealand group, in 47° S latitude, to the North Island in the Sandwich Group, in 22° N latitude, and from the West Coast of New Zealand, in long. 167° E, to Easter Island in 109° W, is this great Polynesian language spoken.... The Polynesian is, therefore, peculiarly an island language, being nowhere found on the main-land in either the East or West continents; or in any of the larger semi-continental islands of the globe.... Williams of the London Mission, (who spent many years among the islands,) considered the principal dialects as being eight in number—of which this of New Zealand is the principal one."—(Essay on the Maori Races, *Transactions N. Z. Institute*, vol. I. §49: which see, for more interesting information on this same subject.)

the language, the noble euphonious language of this ancient people?

Situated as we are here in New Zealand—in Maori-land, what have we done to conserve their language? or to preserve those fast fleeting relics of the past? Of all the British Colonies in the South Sea, this one was the one pre-eminently fitted for this work; I might truly say, called to do it; or, in still stronger and plainer language, that such a work devolved upon her as a duty, which she could neither shirk nor delay;—seeing the enormous and valuable transactions which have been, and are still daily taking place, between the colonists speaking only their English tongue, and the other foreigners (colonists also) each their own national vernacular,—and the aboriginal New-Zealander only speaking Maori! Moreover, to all that has to be added, 1. the great need of skilled educated Interpreters of Maori in our Law and other Courts; and 2. the Maoris, not knowing English, having been admitted into the General Assembly. I suppose you have seen the notice of motion lately given in the Parliament by the Eastern-Maori member, Mr. James Carroll; respecting the necessity of proper educated Interpreters of Maori in the Courts of Justice; and the purging of the present large and “licensed” rank-and-file of those unfitted for that very important and necessary office.⁵⁰⁹

509 WC: To this I may add, that, 25 years ago, (when I was a Member of our Provincial Government, and, also, of the House of Representatives,) I saw so many instances of mis-interpretation, that I took on myself to represent to the Colonial Government of the day, the absolute necessity in the cause of justice of having two Maori Interpreters in all important cases in which Maoris were concerned; one for the Crown and one for the prisoner. And I, also,

I have long been of opinion, that it would have been much better for the general welfare and advance of the Colony, had a Maori (or, better still, a Polynesian) Chair been created in our New Zealand University, rather than some others which have been established there, and which, hitherto, have been of very little real service. But do not misunderstand me: I would be among the last to decry anything instituted for good among us, especially in connection with Science—with a University and its teachings; but the great utility of such a creation as a Maori Chair cannot be gainsaid; very sure I am that its classes and lectures would have been crowded with willing students and diligent learners, seeking after useful information, in order to carry it into daily practice, beneficial to both races.

I am the more inclined to speak and write now on this subject, from noting what the Indian Government has lately done, in connection with their conquest of Burmah—arising, too, (just as here,) from the sheer necessity of the case,—as between the two races using two different languages,—viz. instituted a Burmese Chair in their College. Had New Zealand ever possessed a truly thoughtful Government, deeply careful for the commonweal, no doubt a Maori or Polynesian Chair would have been long ago established in our New Zealand University.—Is it now too late to begin?

Indeed, considering the general bent of the modern Colonial mind, I can only marvel at it not having been

specially saw his Honor Judge Johnstone (now recently deceased) in Chambers, and brought this matter fully before him; he at that time, being the Supreme Court Judge for these parts.—

long ago demanded—*pro bono publico*. At present, as far as I know, there is not a single school in the whole Colony where the Maori language is taught! though such Instruction has been often sought by individuals. But, alas! such apathy in scientific matters seems to belong to our British nation of modern times, and to be derived, or hereditary among us! Here a remark made by Professor Tyndall, (on the occasion already mentioned by me,) seems so exactly suitable that I cannot resist extracting it. Referring to Science, the Professor said:—

“On the Continent of Europe, Kings had been the nursing-fathers, and Queens the nursing-mothers of Science; while Republican Governments were not a whit behind in the liberality of their subventions to Scientific Education. In England we had nothing of this kind; and to establish an equivalent state of things, we had to appeal, not to the Government, but to the people. They have been roused, by making the most recondite discoveries of science the property of the community at large. And as a result of this stirring of the national pulse—this developement of self-reliance—we saw Schools, Colleges, and Universities now rising in our midst, which promise by and by to rival those of Germany in number and importance.”

I trust, that Professor Tyndall’s hopes may be fulfilled to the letter.

From information recently received by me from England, I learn, that the new Oriental College at Berlin was opened in October of last year; and, as a matter of course, a very large number of students have matriculated. There are Chinese, Japanese, Hindustani, Arabic, Persian,

Turkish, and Swaheli (*i.e.*, South African) Chairs, and besides German professors, natives are attached to most of them. It is also announced that Members of the College will have the preference for all appointments of Government Interpreters.—I may here observe, that among our late public telegrams from England was one informing us of a Chinese professorship having been (at last!) instituted at Oxford.

Having touched on this important subject of Philology, some one of my audience might expect me to say a few words on one of the newest and peculiar novelties of the same,—if, indeed, such may be rightly classed as belonging to it,—I mean, the belauded universal or international language named *Volapük*.⁵¹⁰ Of this novelty I shall say very little, mainly, because I know scarcely anything about it, although I have seen one of their publications: and though it is making some small noise and way in the world, (as all wondrous or far-fetched novelties are ever likely to do—for a time, at least.)—I do not believe in it myself, and, as at present advised, can scarcely call it a true science; placing it in the same category with Astrology, Alchemy, Phrenology, Homœopathy, Spiritism, &c. *Volapük* has kept the impure German modified vowels *ä*, *ö*, *ü*, the guttural German *ch*, the compound and difficult English *th*, as well as the rough or aspirated *h*;—and I believe its inventor only intended it as a written language. However, I may tell you, that a *Volapük* Congress was recently held at Munich; their most important proceeding was the

510 WC: So called from *vola*, gen. of *vol* = world, and *pük*, tongue or language.

establishment of a Volapük Academy; eighteen Academicians were elected, representing the several European States with Asia Minor and North America. A few small Volapük books—such as a Grammar, Dictionary, Handbook, Exercises, &c., have also been published, mostly in America.—

And here, to prevent misconception, I would add,—that while I do not believe in Volapük ever becoming a universal language, yet I do believe in such a language being attainable, and that, as the cycles of time roll on, an international or universal world-language will naturally grow and become established. That language will be the English one: which, largely aided by America, and their and our numerous far-spreading, ever-growing, energetic, English-speaking Colonies, will become the universal tongue. And then, (I hope,) when that has come to pass, the simplifying process—long wanted, of making the writing of our mother-tongue plain and easy and rational, will assuredly and naturally follow, on something like the attempted modern phonetic plan. Volapük, no doubt, is attempting something in the same direction but with these great differences, which alone will prove fatal to its success, viz.—its being artificial, not spoken and acquired only by learning, and forced, as if to succeed “by leaps and bounds”—which Nature abhors: whereas the gradual growth and use of the spoken English tongue is, and will ever be, natural, easy and progressive.—

In conclusion: Ladies and Gentlemen, Members,—have again to thank you for your kind attention during my rather long and somewhat discursive address; which, I fear, may be also considered by some of my audience as being both “dry” and prosy as well a diffuse and far-

reaching even unto our Schools, the rising generation, their training, and their pleasures; these, however, contain the germs and roots of the manners and morals and knowledge and actions of our near-future successors, as well as the proper support and continuance (or the contrary) of this branch of the New Zealand Institute. And the present being the only (if not the last) opportunity I may ever have of addressing you on these important subjects, I have endeavoured to do my best and truest respecting them; even to the largely prolonging my address with quotations from the recent living utterances of leading celebrated scientific and philosophical men at Home on these and kindred matters; always preferring to give their words to my own whenever we happen to think alike. To me it has ever been a very high source of pleasure, to find men at Home and far away agreeing with me in original thoughts on various matters (or, if you please, I with them); but both arriving at the same conclusions independently of each other. Just as in the celebrated instance of the discovery of the planet Neptune, (if I may be allowed to compare small things with great ones,) when two able mathematicians, one French and the other English—Adams and Leverrier, severally and apart worked out the position of the then unknown planet with wonderful exactness. And this feeling has not unfrequently been immensely heightened when I have found (casually or in reading their works, or by correspondence,) that those persons abroad were also men of eminence in their various scientific and philosophical pursuits and therefore entitled to speak *ex cathedra* on those particular matters; while I, here, was scarcely worthy to carry their shoes. Moreover, in my

now bringing before you those varied extracts from several recent utterances of celebrated men of science, I trust you will have perceived a consensus of fundamental opinion or agreement (as it were) running through them all; which, also, more or less affects us in this Colony.

Reviewing what I have thought and herein written and read, there is, perhaps, one subject, on which, while I have just touched it very briefly, I may be deemed to have spoken too strongly;—I mean, the inordinate use of tobacco. I would, therefore, add by way of explanation, that it is (and has long been) my firm and growing conviction, that all such early arid extravagant use of tobacco is pernicious in every sense (social and moral) to our young; indeed I deem it—together with the immoderate love of and hankering after costly pleasures and frivolity—to be much more prevalent and far more injurious to the future of this Colony than Drunkenness itself. With the Archbishop of Canterbury (already quoted by me) I firmly agree, when his Grace said,— “There were no royal roads to either leisure or means. There was only one way by which men could obtain a fair share of God’s good things, and that was by the road of diligence, industry, and thrift.”

—And so believing, I have spoken.

I now conclude my address in a few expressive and beautiful lines from Thomson.

“Father of light and life thou *Good supreme!*
O teach me what is good! teach me *Thyself!*
Save me from folly, vanity, and vice,
From every low pursuit! and feed my soul
With knowledge, conscious peace, and virtue pure;

Sacred, substantial, never-fading bliss."

(*Winter.*)

ADDENDUM

SINCE the delivery of the foregoing Address I have received from a scientific friend in London a copy of the *Times* of May 25th, containing a most interesting account of the centenary anniversary meeting of the Linnean Society in the Society's Rooms on the previous day; which I think right to bring forward here (as I should have assuredly done in my Address had I received it in time,)—especially as our highly esteemed first New Zealand Botanist, Sir J.D. Hooker, received the Linnean Gold Botanical Medal, and the eminent Zoologist Professor Owen, (so well-known to us all from his celebrated early profound and long-continued work on the famed extinct New Zealand *Moa*,) the Linnean Gold Zoological one.—

I also notice with much pleasure, that among the distinguished company present was our scientific fellow colonist Sir W.L. Buller—personally so well-known to us.

The first business was the election of the King of Sweden as an honorary Member of the Society. (The Prince of Wales having been elected a Member last year.)

After the delivery of the President's annual Address, the principal item on the programme was the pronouncing of *eulogia* on Linnæus, Robert Brown, Charles Darwin, and George Bentham.

The eulogium on Linnæus had been very fittingly prepared by a celebrated scientific Swede—Professor Thöre Fries, the present occupant of the Chair of Botany

at Upsal: that on Robert Brown was pronounced by Sir J.D. Hooker: the eulogium on Charles Darwin was pronounced by Professor Flower: and Professor Thistleton-Dyer delivered the eulogy on George Bentham.

On the motion of Professor St. George Mivart, seconded by Mr. Grant Duff, thanks were voted to the Authors of these eulogies.

Then followed the presentation of Linnean Gold Medals to Sir R. Owen as a Zoologist, and Sir J.D. Hooker as a Botanist.

The President explained, that it had been determined to establish a Linnean Gold Medal to be presented in subsequent years alternately to a Botanist and Zoologist but on this occasion two were to be presented and there had not been any question in Council as to who the first recipients were to be. The medal had on one side the portrait of Linnæus, taken from the bust in the room, and on the reverse the arms of the Society with the motto, "*Naturæ discere mores*," surrounded by the *Linnæa borealis*.⁵¹¹ The President first made the presentation to

511 WC: Wishing to make this clear to all readers; I briefly add a few words respecting this plant. Dr. J.F. Gronovius, the friend of Linnæus, in describing it, says:—"This little northern plant long overlooked, depressed, abject, flowering early, Linnæus himself selected as most appropriate to transmit his name to posterity." Its proper home is in the dry woods throughout Northern Europe; and in N. America and in Canada across the whole N. coast. It is also a native of fir woods in Scotland, in Perthshire, Inverness-shire and Aberdeenshire; but only one station is known of it in England—in Northumberland.

Professor Owen, recounting his distinctions and scientific services, and handed him the medal amid loud cheers.

Professor Owen, who was much affected, expressed his high sense of the honour conferred upon him, and thanked the Fellows for their cordial reception.

The President then made the presentation to Sir J.D. Hooker, recapitulating his services to Science.

Sir J.D. Hooker, who was warmly cheered, returned his cordial thanks to the Council and the Society,—“of which members of his family had been members for three generations.”

W. COLENSO

Napier, July, 1888.



[Harding, Printer, Napier]

It is a modest delicate and graceful little trailing and spreading small-leaved woody-stemmed plant, forming large green patches. Flower-stems long, erect, always two-flowered. Flowers bell-shaped, fragrant, elegant, drooping, rose-coloured, yellowish within: only one species known.

In the Natural System it belongs to the same natural Order as the Honeysuckle. Here in New Zealand we have only one genus belonging to the same order; a small sweet-smelling forest shrub; rather scarce here, but plentiful in the woods north of Auckland, where it was early discovered by A. Cunningham, and fittingly named by him—*Alseuosmia* = fragrant wood-odour.

**1888 A few stray Notes on the New Zealand Owl,
Athene novæ-zealandiæ, Gml.—Ruru and
 Koukou of the Maoris, and Morepork of the
 Settlers.**

Transactions of the New Zealand Institute 21: 200-205.

[*Read before the Hawke's Bay Philosophical Institute,
 8th October, 1888.*]

When he heard the owls at midnight
 Hooting, laughing in the forest,
 "What is that?" he cried in terror;
 "What is that," he said, "Nokomis?"
 And the good Nokomis answered:
 "That is but the owl and owlet,
 Talking in their native language,
 Talking, scolding at each other."

—*Hiawatha*, Canto III.

SEVEBAL years ago—from 1844 to 1853—it was my lot to be often travelling on duty in the Wairarapa district. On one of those occasions I wished to reach the Maori village at the mouth of the Pahawa River on the east coast from the upper part of the Wairarapa Valley. In travelling thither we brought up for the night at the edge of a thicket, where my tent was pitched under a tree. My travelling companions and baggage-bearers, being weary with a long day's journey, were soon asleep, while I sat up reading, enjoying the stillness of the night, for it was a beautiful calm and moonlight one. Presently I heard a

strange noise, or rather a succession of strange and peculiar unusual noises, such as I had never heard before. These were repeated over and over, in different and strange keys and semi-discordant tones, mixed with shrill hissing, and seemed as if coming from some creatures over my head; and at last, as I could not stand it any longer, I unlaced the door of my tent and got out.

Keeping quiet, and concealing myself and looking up, I saw two owls on a rather bare extended horizontal branch of the tree only a few feet above me, and these were a pair, male and female, carrying on their courtship in the most strange manner imaginable. Such a grotesque sight I never saw before or since. The manner in which they acted; their pantomimic movements—half sedate and half funny—the gentleman owl advancing from his end of the branch with his head-feathers trimmed and set up *cap-à-pie*, and his wings let down, making with them a jarring noise as if he were a little turkey-cock, and at the same time uttering all manner of strange wooing sounds, high and low, short and long; and then the lady owl, on her part, retreating to the further end of the branch with measured step and slow, turning round, bridling herself up, hissing, and scornfully resenting the behaviour of the other; also, at times, uttering [201] strange noises, and adjusting her feathers to suit her scornful affected prude demeanour. Then the disappointed beau would slowly retire, making other peculiar sounds, to his end of the branch; when the lady would again come forward, very slowly and coquettishly, to her old position, and in a short time the gentleman owl would re-enact the solemn fun as before, only to be again served in the same kind of way. Such a mixture of strange sounds and grimaces, of

pure bird *persiflage*, was unique and unusual. Words fail me fully to describe them; it was most ludicrous to behold them. The usual solemn gravity of the bird seems to have been abandoned or burlesqued. I watched them for about half an hour, when, as their play was still being carried on without alteration, I returned to my tent. I could not help thinking, from observing the extreme suitableness of that long horizontal half-denuded branch, with its bunch of leafy sprays at both ends, for their wooing and serenading,—and bearing in mind how confined the owl naturally is in its short flights, and prone to return to its haunts and perches,—that that branch was used as an old trysting-place by owls. I did laugh most heartily, though quietly, at this serio-comic performance; and whenever I have thought thereon, during these many subsequent years, it has always caused me to laugh outright.

I dare say some of my audience are acquainted with that charming book of Natural History, Gilbert White's "History of Selborne," so highly prized at home by our fathers. To those who know it, I need not say anything about it; but to those who do not, I would say—it is a most interesting book, written by an accomplished and loving naturalist, a keen and attentive observer of Nature in her manifold forms, but especially at home in his many and diverse observations on birds, as well as other animals: it is not a "dry" book. Mr. White was born at Selborne, in Hampshire, England, where, after his return from the University of Oxford, he quietly resided all his days, so spending an amiable, unambitious, and useful life, and died at an advanced age, much regretted. He steadily refused all church preferment, and during the last

few years of his life officiated as curate of Selborne. His standard work has gone through several editions, and has always been highly esteemed by all lovers of Nature.

Here I may be allowed to give a short sentence from its preface, written by himself exactly a hundred years ago (1788): “If the writer should at all appear to have induced any of his readers to pay a more ready attention to the wonders of the creation, too frequently overlooked as common occurrences, his purpose will be fully answered. But if he should not have been successful in any of these his intentions, yet there remains this consolation behind—that these his pursuits, by keeping [202] the body and mind employed, have, under Providence, contributed to much health and cheerfulness of spirits, even to old age.”

Among his numerous scientific correspondents, one, who then stood prominently, was the celebrated working British naturalist Pennant, who was himself a correspondent of Linnæus. (Some of the works of Pennant are on our library shelves: and his name is maintained and recorded among us in this country as that of a botanical genus, in our curious New Zealand forest-tree, *Pennantia*, so named by Forster.) And in an early letter from White to Pennant he makes a very similar complaint to that which I also drew your attention to in my “Presidential Address” four months ago. White says: “It has been my misfortune never to have had any neighbours whose studies have led them towards the pursuit of natural knowledge; so that, for want of a companion to quicken my industry and sharpen my attention, I have made but slender progress in a kind of

information to which I have been attached from my childhood."

To return. On this subject of the variations in the hooting of owls, White has some shrewd remarks, bearing, I think, on this part of owl-conduct I have just narrated; though it does not appear that White, or his correspondents, had known the reason or cause of the variations they had noticed in the owl dialect. White says: "A friend remarks that most of his owls hoot in B flat; but that one went almost half a note below A. The pipe he tried their notes by was a common half-crown pitch-pipe, such as masters use for the tuning of harpsichords; it was the common London pitch." And, again, White remarks: "A neighbour of mine, who is said to have a nice ear, remarks that the owls about this village hoot in three different keys—in G flat or F sharp, in B flat, and A flat. He heard two hooting to each other, the one in A flat and the other in B flat. Query: Do these different notes proceed from different species, or only from various individuals?" (*loc. cit.*, pp. 234, 235.)

Other and very interesting remarks by White, on owls, are to be found in his letters. An extract from one in particular I will give you. It is contained in a letter to the Hon. Daines Barrington, whom you may remember hearing of as taking a long journey (in those days) to Mousehole, at the extreme end of Cornwall (close to my native place, and not far from the Land's End), to see and converse with the celebrated old fisherwoman, Dolly Pentreath—said to have been the last person who spoke the ancient Cornish language. White says: "We have had ever since I can remember a pair of white owls that

constantly bred under the eaves of this church. As I have paid good attention to the manner of life of these [203] birds during their season of breeding, which lasts the summer through, the following remarks may not be unacceptable: About an hour before sunset (for then the mice begin to run) they sally forth in quest of prey, and hunt all round the hedges of meadows and small enclosures for them, which seem to be their only food. In this irregular country we can stand on an eminence and see them beat the fields over like a setting-dog, and often drop down in the grass or corn. I have minuted these birds by my watch for an hour together, and have found that they return to their nest, the one or the other of them, about once in five minutes; reflecting at the same time on the adroitness that every animal is possessed of as far as regards the well-being of itself and offspring. But a piece of address, which they show when they return loaded, should not, I think, be passed over in silence. As they take their prey with their claws, so they carry it in their claws to their nest: but, as their feet are necessary in their ascent under the tiles, they constantly perch first on the roof of the chancel, and shift the mouse from their claws to their bill, that their feet may be at liberty to take hold of the plate on the wall as they are rising under the eaves.

... The plumage of the remiges of the wings of every species of owl that I have yet examined is remarkably soft and pliant. Perhaps it may be necessary that the wings of these birds should not make much resistance or rushing, that they may be enabled to steal through the air unheard upon a nimble and watchful quarry. ... When brown owls hoot their throats swell as big as a hen's egg. I have known an owl of this species live a full year

without any water. Perhaps the case may be the same with all birds of prey. When owls fly they stretch out their legs behind them as a balance to their heavy heads; for as most nocturnal birds have large eyes and ears they must have large heads to contain them. Large eyes, I presume, are necessary to collect every ray of light, and large concave ears to command the smallest degree of sound or noise" (*l.c.*, pp. 245, 246).

And all these apt quotations naturally bring me back to the main subject of this paper—our little New Zealand owl.

Probably none of you present have ever been in an unfrequented New Zealand forest many years ago—say, half a century, or forty years. Then those woods teemed with bird-life, so widely different to what has obtained of later years. Then our little New Zealand owl was to be often seen snugly ensconced in some sheltered umbrageous nook, and not unfrequently nestling close under the fronds of the tree-fern (*Cyathea dealbata*).

There, for me, such would have ever remained unmolested, but not so by the smaller birds—denizens of the forest; for, as soon as his retreat [204] was discovered by them, the battle, or rather the mobbing, began. The incessant noise the little fellows made brought up their friends from all quarters, and I have been sometimes astonished to see the great number—the cloud—of those small birds so quickly got together; and then, too, their apparent fearlessness or carelessness of my presence, of which they seemed to take no notice, so filled with rage were they and so very intent on insulting their common enemy. But while they would often fly up quite close to

him, yet they never laid hold of him or touched him with their beaks; not a feather flew. Still the owl did not like it, and tried hard to get at them without removing from his perch, by thrusting forth his head and fiercely snapping his beak; and while I could see the difference in the dilation of the pupils of his eyes, which sometimes glared on the disturbers of his sleep and peace, yet I doubted if he clearly saw them, although he must have heard them plainly enough. I have never known the owl at such times to make any sound. Occasionally I have seen the so-persecuted bird fly away to some other neighbouring tree or bush; but in so doing he would generally make a woeful mistake, sometimes by coming abruptly against a branch, or between the close-growing canes of supplejacks (*Rhipogonum*), and sometimes by lighting in a less secure place, where the enemy could surround him, and then another fly-away would take place, and I have watched him to fly back to his old quarters; but it always seemed as if there would be no rest, no peace, for him while day-light lasted; and then, no doubt, the tables were turned upon his persecutors with heavy interest.

There being formerly no mice in this country, and I suppose our little New Zealand owl was far too diminutive to attack the now extinct New Zealand rat, and the small birds of the woods being then so exceedingly plentiful, these no doubt formed its chief articles of food, and this the little aerial legions well knew, and so naturally united to persecute him. I have good reasons, however, for knowing that some of our larger insects, especially of the Orthopterous order, as the big grasshoppers in the plains, and the wetas (*Deinacrida*

and *Hemideina*) in the forests, formed a portion of the food of our owl; and now since mice have been introduced and become so numerous, and the indigenous small birds on the other hand have become so scarce, our owl does his share in the economy of nature to keep their number down, and therefore should never be wantonly destroyed as if he were an enemy and invader of the “rights of man.”

Before I close I would briefly refer to that exquisitely conceived and highly natural legendary fable of the ancient Maoris—viz., the great fixed “battle between the land and [205] sea birds,”⁵¹²—which has always served to remind me of Homer’s battle between the frogs and mice—in which our little owl, who could not join the great united army of land birds in the long day’s sanguinary conflict, owing to his being a nocturnal bird; yet, at the close of that prolonged fight, when the sea birds were utterly routed, distinguished himself by acting as a brave herald-trumpeter, and so added to their fear by joining in the pursuit with his insulting discordant note of ironical derision—*toä koë! toä koë!*—thou (art) brave! thou (art) victor! These words are ludicrously Maorified from the owls’ common note of *koū koū! koū koū!* by a kind of onomatopœia—so common among the Maoris, and which a Maori, by a slight twist in the pronunciation, and more particularly when made in the mimicking tone, would cause them to pretty nearly resemble.

Having referred to that ancient Maori fable of the battle of the land and sea birds, in which nearly all our

512 WC: Translated briefly—together with some other of their ancient fables—by me, in *Trans. N.Z. Inst.*, vol. xi., p. 102.

indigenous land birds are brought to the fore to repel the invaders, to fight and to perform prodigies of valour, even to the including of the piwakawaka, *Rhipidura flabellifera*, Gml.—the pied fantail-flycatcher—I would just call your attention to the grave fact of the total omission of the gigantic moa (*Dinornis*, sps.), and of all allusion to it, as a further proof of what some of you have already more than once heard from me, that *the ancient Maori did not know of its living existence as a bird*; for, if they did, they would have assuredly brought it prominently forward on that occasion as their great hero and redoubted champion, and the dreadful foe of the sea-birds, to whom, as giants in the battle-field, Goliath of Gath, or Og of Bashan, would have been but puny comparisons. That one plain and striking list of negative evidence, *re* the age in which the moa existed, has ever seemed to me to be of far greater value than all the loud and fussy statements of modern Maoris, made to suit the times and the wishes and questions of zealous European inquirers.

1889 Ancient tide-lore and tales of the sea, from the two ends of the world : also, some highly curious, ancient and legendary little-known East Coast Maori stories translated with explanatory notes on the same.
R.C. Harding, Napier. 48p.

[*Read before the Hawke's Bay Philosophical Institute, August 15th, 1887.*]

“Time erases the fictions of unfounded opinions; but confirms the judgements which are in accordance with truth.”

—Cicero

“The truth is perilous never to the true,
 Nor knowledge to the wise; and to the fool,
 And to the false, error and truth alike.
 Error is worse than ignorance.”

Bailey, *Festus.*

“If an offence come out of the Truth,
 better is it that the offence come
 than that the Truth be concealed.”

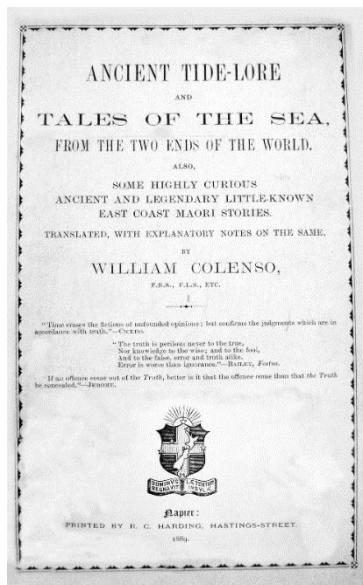
—JEROME

“O mare! O littus, verum secretumque
Mouseion!⁵¹³ quam multa invenitis! quam multa
dictatis!”⁵¹⁴

—Plin. min., *Ep.* i, 9.

“There is a pleasure in the pathless woods;
There is a rapture on the lonely shore;
There is Society where none intrudes,
By the deep Sea, and music in its roar:
I love not Man the less, but Nature more.”

Childe Harold, iv, 178.



513 WC: Μουσεῖον!

514 Thou sea and shore, solemn and solitary scene for contemplation, with how many noble thoughts hast thou inspired me!

I had been lately reading some of the curious theories respecting the tides of the Sea, that were anciently held or advanced by the wisest and most civilized nations or the philosophers of Greece and Rome; also, some far more strange and peculiar notions held by Western Europe, and by Oriental Races in more modern times, which, possibly, in a measure are still by them maintained; and this naturally brought me to a reconsideration of what the Maoris believed to be the origin and cause of the tides; which being curious and not wholly unlike what has been anciently upheld in other parts of the world, has induced me to write a Paper on it; together with some kindred strange and legendary sea-stories, selected from the many such formerly known to the Maoris; believing that the same may prove interesting to the members of this Institute.

I. OF THE CAUSE OF THE TIDES.

§1. *Maori.*

The New Zealanders believed that the ebbing and flowing of the sea was occasioned by a huge ocean-monster, whose home was low down in the depths beyond the horizon, through its powerful and regular respiration, or ingurgitation and regurgitation of the water. Far off foreign lands were considered to be [2] lying beyond it. This monster's name was *Parata*: which term is commonly used figuratively and proverbially for anyone unexpectedly meeting with great trouble, that such a person has fallen into the throat of the Parata. Indeed, in one of their ancient and prized myths which treats in popular language of their first peopling New Zealand, one of their chief canoes named "the Arawa" is

said to have really got into that difficulty and was carried into the enormous mouth of the monster, from which fearful Maelstrom it was with difficulty extricated by Ngatoroirangi, the courageous and cunning *tohunga* (priest or wise man) on board, who recited his powerful charm for that purpose which proved effectual: the words of the said charm or spell being also preserved.⁵¹⁵

Not unfrequently in former years (since the New Zealanders had learned to write) a laconic epistle, etched with a nail or fragment of shell on a fresh flax leaf (*Phormium*) would be despatched from those in sudden private or local trouble to their relatives or friends, couched in these words:—"E hoa ma, whakarongo mai, kua taka matou ki te korokoro o te Parata:" = Friends listen, we have fallen into the throat of the *Parata*; and that, like the Fiery Cross of the far North, would often be sufficient to secure their prompt and hearty assistance. As might naturally enough be supposed among a superstitious people abounding in charms and spells, witchcraft and incantations, the aid, real or imaginary, of such a powerful living being, whose irresistible and regular action was daily seen on their shores and in their rivers, was sure to be malevolently sought against their enemies; so, one of their solemn maledictory spells begins thus:—

"Dreadful big beetling precipices deep down in
Ocean's depths, listen! obey! be quick and lie

515 WC: A version of this charm or spell will be given in the Appendix. Note A

scattered far off to the right and to the left,⁵¹⁶ that the mighty *Parata* may go to work.

“*Parata!* hear! blow thy irresistible overwhelming tides strongly hitherwards to the shore.”

This was done in order that the sea-side forts and villages (always close to the beach and sometimes built on it) might be inundated by the sea, and so, easily overcome; and their inhabitants scattered and with, their canoes destroyed. [3]

Of course we of to-day are a step in advance of our own forefathers in this matter; we can well afford to laugh at the power of such a charm or spell, based on such a belief; nevertheless the New Zealanders believed in it, and we may easily imagine, that if, after solemnly uttering their spells by the priests at their pagan altars, and with all due and fearful invocations and ceremonies, a storm came on from the sea, or a high tide followed, that such would be laid hold of as a favourable omen and be sure to inspire them with extra courage in their fiendish work of destruction and slaughter! Besides among a race like the Maoris, keen and constant observers as they ever were of the appearances of the heavens and of the varied phenomena of Nature—who had proper significant names even for every day of the moon’s age with their lucky and unlucky thys, as well as for the different stages and seasons of the tides; who knew all about times of flood and ebb, of high and low water, spring and neap tides &c, with their numerous intermediate variations—it is likely that their *tohunga*,

516 WC: Lit. to the one side and to the other side: “*ki tetahi tahu, ki tetahi taha.*”

who had to utter the said powerful charm, would avail himself of his knowledge of the time of the spring tides to make it appear to be the more effectual.

I scarcely need remark, that such spells and invocations were not confined to the New Zealanders, or to uncivilized people like them. Plenty of such doings will be found among the records of the oldest and most civilized nations of antiquity. The ancient world had great faith in curses and spells. Numerous formulas of imprecatory charms or curses and exorcisms have been deciphered on ancient Babylonian and Assyrian cuneiform tablets,⁵¹⁷ some of which date back at least to the 16th century B.C. The Hebrews also abounded in them: their neighbours the Moabites and Midianites strove hard through Balak the king of Moab to induce the prophet Balaam to curse Israel. Grecian and Roman history affords us plenty of examples.⁵¹⁸ Spells were held to control and rule the very elements and all Nature; to draw down the Moon and stars from the skies, to direct the winds, to conjure up thunder-storms, to check the [4] movements of serpents and to make them burst asunder. But it is right to add on the authority of Pliny “that the wisest persons rejected all such beliefs;” and another deep remark of his on the same subject should not be overlooked:—“To believe that we can command Nature is the mark of a bold mind, nor is it less the mark of a

517 WC: “*Records of the Past*,” vols. i, iii, &c.—“The curse like an evil demon acts against the man,” &c.

518 WC: The witch Canidia, Hor. *Ep.* xvii.

feeble one to reject her kindness.” —*Nat. Hist.*, bk. ii, ch. 54.

More than 1800 years have elapsed since Pliny penned those words, “that the wisest persons rejected all such beliefs,” and yet I think it is not too much to say that such occult doings are still firmly held and believed in all over the world! Amongst the oldest and most civilized nations as well as those others who are only just emerging from a state of barbarism—though not to the universal extent that such charms and curses formerly were.

Of late we have had several notable instances here among us in New Zealand; on the one hand the so-called faith-healing powers with all their lowering adjuncts (reminding us of what we read of “certain vagabond exorcists—the seven sons of Sceva”⁵¹⁹ put forth and supported by educated men who ought to have known better; on the other hand the acts committed by some of our Maori neighbours, lately tried for murder and condemned to die for killing a Maori sorcerer or wizard! in which, no doubt, they both have and do glory, as having wrought a good deed.⁵²⁰ To me, however, it matters not, whether such acts and deeds of the olden times were real or not; that is, whether such stories are authentic relations of matters that really and truly happened, or were then believed to have happened; or whether such stories are merely romances or novels of the olden times, and this remark applies equally to those

519 WC: *Acts*, xix, 13.

520 WC: Being strengthened in the ancient belief of their people, with the Bible in their hands:—*Ex. xxii, 18; Lev. xx, 27; Deut. xviii, 10.*

of the Hebrew and other Oriental races, as well as to those of the Greeks and Romans, and other nations still farther West; for whether true or not, the underlying principle is precisely the same in either case, showing clearly that such powers were firmly believed in and sought, or feared and averted as the case might be. [5]

Formerly, and down to some years ago,—the winding track or course from Napier into the interior to Te Aute and Waipawa lay by the immediate bank of the river Ngaruroro; and one of the ugly and often dangerous places which had to be crossed at its mouth was a brawling, noisy watercourse or fall on the East bank, which drained the big marsh on the plains. This waterfall was called by the Maoris,—*Wahaparata*, = Parata's mouth; from the noise it made, from the ever-varying amount of water it discharged, and from its being disagreeable and dangerous; besides as I have heard old Maoris say, it was affected by the high tides on the coast; and in this respect they may have been correct, as the sea is not far distant in a direct line and the river Ngaruroro (and also the river Tukituki which bounds the said marsh on its East side,) is but a short distance from it, and both rivers are greatly influenced by the tide for several miles from their (one) mouth. Pliny relates instances of wells in cities near the sea being largely affected by the tides in his time (*loc. cit.* bk. ii, ch. 100.) Many an early settler has come to grief in crossing that place—*Wahaparata!* I myself, more than once, among the number; some having had to swim for it, themselves and their horses, when the water in the river Ngaruroro was high.

Here I may briefly state, that this word or name of *Parata* was also of great and ancient usage among the Maoris. The first time we hear of it was as the name of a principal chief, before the legendary period of their so-called migration hither to New Zealand; for thus it is stated in their legends:—

“Soon they fought, shortly after peace was made; then they felled (the tree to build) the canoe Arawa, this was done by *Parata*, by Waheroa, by Ngahue.”⁵²¹

In the old myth of Maui transforming his brother-in-law Irawaru into a dog, and the widow, his sister (Hinauri) becoming distracted over the loss of her husband, she goes off to the rocky cliffs at the sea-side to commit suicide, and there utters her mournful dying dirge, beginning thus:

“Ever lamenting I—
 Henceforth I (am) ever imploring
 To the stealthy one⁵²² of the ocean, [6]
 [Or, steep precipices in ocean’s depths.]
 To the big Parata of the ocean,
 To the huge monster of the ocean,
 To the enormous whale of the ocean,
 That (he) may come hither
 That Hina may be swallowed up.”

521 WC: Grey's “*Poetry of the New Zealanders;*” *Korero-Apitī*, p. viii.

522 WC: Lit. Paikea, a large species of whale with a white belly, deeply grooved longitudinally; one was stranded on the beach near Napier about 1847; also a Maori name for a long house with the doorway in the end. (“*Trans. N.Z. Inst.*,” vol. xiv, p. 20, Note.)

So saying, she threw herself into the sea, and was drowned.

The word is also found in the ancient prayer or semi-incantation used by the *tohunga* at their old cannibal orgies, when initiating the young men and boys (chiefs' sons), in order to their partaking of the flesh of their enemies slain in battle. Thus it begins:—

“This youth present gnaws,
 This youth present strives,
 This youth present eats,
 This youth present eats man’s flesh.
 This youth present swallows *parata*:”

which may mean “lords (of foes),” or “monsters,” or “great difficulties and dangers,” (or all together,) overcoming them as easily as “swallowing one’s spittle” (a common Maori metaphor). The said long prayer or spell concludes thus

This youth shall soon eat,
 This youth shall soon swallow man,
 Shall eat to-day,
 Shall eat to-morrow (hereafter),
 Sufficient now (for the first time) this youth shall eat.”

Parata is also the name of that part of a war-canoe that projects out at the bow, beneath the image or figure-head, and meets the rising waves; near this was the coveted seat or stand of the hero or warrior chief. Thus the old song:—

“To stand firmly at the bow of the canoe (is to be) renowned.”

The term is also commonly used in their mournful poetical laments and dirges over their dead chiefs, in these (or similar) words:—

The eddy-squall is over; the storm is passed away;
The *Parata* is gone; the big fish⁵²³ has left its habitation.”

§2. Foreign.

In the beginning of my Paper, I alluded to what the ancient philosophers of highly-civilized European states, and also some Orientals had believed respecting the tides; I will now give a [7] brief epitome of a few of them; which may prove of some service to us when considering the wild notion of the ancient Maori.

Ancient civilized nations knew little respecting the tides. There being scarcely any tide in the Mediterranean, the Greeks, though a maritime people, had scarcely any opportunity of observing them. Homer, for instance, (B.C. 900,) who abounds in oceanic lore, does not once mention, or allude to them; unless it is in his speaking of fell Charybdis disgorging thrice a day; thus, in the directions given by Circe to Ulysses for his voyage, she says:—

“The other rock, Ulysses, thou shalt find
A bow-shot only from the first; and here
Charybdis dire ingulphs the sable flood.
Each day she thrice disgorges, and each day
Thrice swallows it.”

523 WC: Appendix, Note B.

—ODYSSEY, book xii, *Couper's translation.*

This supposition, however, derives some support from the ascertained fact, that in the Straits of Messina there is a considerable range of tide; this is, also, alluded to by Cicero (B.C. 70):—

“What can be more regular than the flux and reflux of the Euripus at Chalcis, the Sicilian sea, and the violence of the ocean in those parts? The same appears on the Spanish and British coasts. Must we conclude that some Deity appoints and directs these ebbings and flowings to certain fixed times? Consider, I pray, if everything which is regular in its motion is deemed divine, whether it will not follow that tertian and quartan agues must likewise be so, as their returns have the greatest regularity. These effects are to be explained by reason; but, because you are unable to assign any, you have recourse to a Deity as your last refuge.”—*De Nat. Deor.*, book iii, e. 10.

The Grecian historian Herodotus, (B.C. 450,) who had travelled in Egypt, mentions the tides of the Red Sea as if they were something new, but only in very few words, viz.:—

“In this bay of Arabia the tide daily ebbs and flows.”—*Euterpe*, ch.xi.

Plato, (B.C. 400,)—holding the theory of an *Anima Mundi* or Spirit of the Earth, and believing that this globe was a gigantic animal, on the surface of whose body men and beasts, as tiny parasites, crawled through their short existence—thought there were vast caverns beneath the ocean depths, and that as the vital breath, or $\pi\omega\epsilon\bar{\nu}\mu\alpha$, of the earth breathed in these caverns the waters were forced

up in masses or tides. The ebb-tide, of course, would be the return of the water into the caverns when the respiration of the earth was over, and the earth-lung, as it were, was emptied. This notion is very near akin to that of the Maoris, and to some others which follow. [8]

It is worthy of notice, that Aristotle (who died 322, B.C.,) says little about the tides; although the army of Alexander the Great, his pupil, were startled at first seeing them in the Persian gulph; and no doubt Aristotle would be informed of that. However, in all his works he only mentions them three times, and then only slightly; saying, in one place, there are great tides in the North of Europe; in another, of their having been said by some to be caused by the Moon; and in a third, that a tide in a great sea is higher than in a small one. Some of the ancient writers have said, that Aristotle drowned himself in the Euripus (Straits of Messina), because he could not find out the cause of the flux and reflux of its tides.

Plutarch (B.C. 200,) says, that Pytheas ascribed them to the Moon; and, according to Strabo, Pytheas had been in Britain, and there he must have observed them. Caesar (B.C. 50,) writes of them in his fourth book of the Gallic war. Pliny explains their rising and falling at some length, and in several respects correctly, attributing them to the dragging powers of the Sun and Moon.—*Nat. Hist.*, bk. ii, ch. 97.

The mediaeval theory was very strange and fanciful, and closely resembled that of the Maoris; probably it was derived from the Norse myth of the world-circling serpent. It held that the monster leviathan in the ocean depths, like a huge whale, vomited forth masses of water,

which formed the high tide, and then sucked up part of the ocean again, which formed the ebb. In the Isles of Shetland, it is said, some of the fishermen still, until living memory, retained this ancient Norse explanation, and believed in an enormous serpent in the sea, who every six hours sucked up or vomited forth the ocean tides.

The Hindus hold that the ebb and flow of the tide expresses the respect of the sea for the god Somnath—a beautiful and poetic notion—the ocean doing obeisance to its Lord and Creator. The Malays say, a gigantic crab at the bottom of the sea causes the tides.

We find that Pytheas and Pliny, and others of the Augustan age, correctly attributed the tides to the Moon; but even so late as the times of Galileo and Kepler these eminent astronomers doubted it. Our Sir Isaac Newton, however, proved it and Laplace established the evidence. We now know that the [9] ordinary tides are the result of the Moon's attraction, the springtides the result of solar plus lunar attraction. It is easy to us to see this; and it is both amusing and instructive to know the guesses of primitive and uninstructed men to explain this curious yet common phenomenon, which in Hawke's Bay we can notice twice daily.

II. OF THE SOUNDING OF THE SEA.

§1. *Foreign: Cornish.*

During my long residence here on the immediate shores of Hawke's Bay, I have often been led to think of some of the peculiarities of my native Cornish shores, both real

and mythical: one of each class I will briefly mention. (1) What used to be termed, “the Calling of the sea,” a natural occurrence: and, (2) the legendary story of “Tregeagle.”—

(1) The “Calling of the sea,” (as this natural phenomenon is termed in Mount’s Bay in West Cornwall,) is peculiar, and at the same time common, and long observed. In the neighbourhood of Penzance (in Mount’s Bay), there is often heard inland a murmuring or roaring noise, locally termed “the Calling of the sea,” which sometimes extends to eight or ten miles; while at other times, although to a person on the shore the sea may seem equally loud, and the state of the atmosphere equally favourable, no sound whatever from the sea can be heard at a mile from it. When the “Calling” proceeds from a different direction from the wind, or when it occurs during a calm, it is almost invariably followed by a wind from that quarter. The “Call” is followed by the change, generally within six hours, but sometimes not until twelve, or more. This Calling of the sea must not be confounded with the sound arising from a ground swell, which is widely different. Something of this kind I have formerly heard here,—at Taipo beyond Taradale, about eight miles from Napier—in the stillness of the night; which probably was the cause of that place receiving the expressive name (*Taipo* = noisy night-sea or -tide) from the keenly observant old Maoris.

(2) The story of *Tregeagle* is a curious one; one of the many old legendary myths once so firmly believed in the West. Tregeagle is the spirit of some one of the olden time, who for his [10] misdeeds was doomed to make up

into bundles the heaps and masses of sand thrown up on the shores of the Land's-end during heavy gales, and to remove them! Hence the wild shrieks of this spirit wore frequently heard during the raging of the storm, enraged at his heavy Sisyphean labours; for as fast as he removed the sands they were brought back again. No doubt the melancholy wail of the Sanderling and other shore birds at such times, heightened by the loud and peculiar fitful reverberations of both winds and seas from the granite caves and cliffs of those shores, were the causes of those noises. I have often thought on Tregeagle when travelling in former days by the sea-coast and spending my nights on the lonely beaches, especially in times of gales from the sea; when ever and anon the wailing cries of the sea-birds would strike on the ear in the silence of the night; my Maori companions being all fast asleep.

§2. Colonial: Hawke's Bay.

The South side of Hawke's Bay is one continuous unbroken shore, the sea-beach level without rocks and mostly covered with shingle, extending in an easy curve for many miles from Ahuriri (now Napier) on towards Cape Kidnappers. In former years I often had "to plod my weary way" on foot over this long stony beach, in going to and returning from visiting the small scattered Maori villages many miles distant from my abode at Waitangi; and we (myself and party of Maori baggage-bearers) not unfrequently did so by night, especially if moonlight, on account of the coolness of the night-air and there being no fresh water to be had, which in the hot days of summer was so very much needed. At that time

there were no roads nor pathways, therefore we often kept on the beach near the sea. New Zealanders always used to travel in single file and in strict silence, and of course we did so. Sometimes that peculiar sound of “the calling from the sea” was heard; and on other occasions a still more aberrant one, viz., of a long continuous unbroken semi-metallic sounding tingling weird-like wail, which took some time (a few minutes perhaps) to exhaust itself in the distance; when, after a short time, it would strike up again and in the stillness of the night could be heard a long way off, coming on steadily towards us (or the place where we were), and then on reaching us going off towards the Cape, dying gradually away in the most attenuated [11] melancholy sound imaginable. I have not unfrequently stood still to wait for and watch it coming up, brought steadily along the shore by a low unbroken wave rolling diagonally:—

“Till my soul is full of longing
For the secret of the sea,
And the heart of the great ocean
Sends a thrilling pulse through me.”

Longfellow: *“The Secret of the Sea.”*

It was certainly curious to see it coming on, arriving, passing, and going away in the distance, carrying its music with it. It always moved in that one direction along the shore nearly due East; and from the time the sound occupied in leaving me and dying away, compared with the time it took in coming up, it seemed as if it went right on to the cliffs some miles off; but that, I think, could not be, as the mouth of the river Tukituki, 1-2 miles distant, lay between the place where I stood and the cliffs. I never

could find out whether that diagonal musical wave was caused by a current along the shore, or by the tide, or by a wind at a distance. At such times my travelling party if straggling would be sure to keep close together; indeed, quicken their paces and huddle up with a run! (*Sauve qui peut!*) averting their faces from the sea while the wave and sound were passing-by; for the Maoris never liked to hear it; having many old superstitious stories and notions concerning it (of the Banshee and Kelpie class); some of them have served vividly to remind me of Tregeagle and his shrieking on our Cornish shores. I have known some of my Maori Christian domestics, even at the Mission Station, to come cowering to me in a state of great alarm, at a late hour on a very still summer's night, with their sleeping garments half-shrouded over their heads and ears, when those peculiar tingling melancholy wailing sounds have been louder and clearer than usual, affirming they could not sleep on account of it; and verily the countenances of some of them indicated great terror.⁵²⁴

To them that peculiar thrilling tingling sound was of highly ominous import; and no marvel! For some had often heard of its happening just before such and such a time of murder and [12] carnage and horror; while others, their elders, had themselves noticed it as similarly occurring. And, no doubt, they were right, so far as to the accidental happening together of the two events; but as

524 Is there not some pretty close resemblance here,—between the thoughts and ideas of the Maoris and those given in Ossian? e.g.—“Alpin, thou son of song, why alone on the silent hill? Why complainest thou as a blast in the wood—as a wave on the lonely shore?”—*Ryno and Alpin*.

for cause and effect, or faithful presage and portent, these meanings were as far asunder as the “fiery shapes of burning cressets in the heavens” at the nativity of Owen Glendower, or the kittening of his mother’s cat!—as our Shakespeare very naively gives it.

Another and not altogether dissimilar superstition of the New Zealanders may also be briefly mentioned here, as further showing the deep-seated imaginative trait of the native character,—I think I may truly term it a poetical one. Formerly they had many scattered villages on the banks of their rivers and streamlets and adjoining forests near to their food plantations and fresh-water fisheries; and sometimes those villages would be prettily, or even romantically situated not far from a small waterfall. But on still nights in peaceful days in the olden time, the exceeding stillness of a New Zealand night was very great, so that all sounds however slight could be clearly heard at a distance, and that of a waterfall a long way off, especially by the ever-watchful natives whose faculty of hearing as well as of seeing was always far greater than that of a European, as I have already in my former Papers more than once shown. On such quiet nights a remark like the following has been suddenly made;—“Ah! something is going to happen to us, listen to the waterfall, [or, to the ripple of the current,] how it has changed its common murmuring tone; it is sighing now; lamenting sympathizingly over what is coming to pass.” And it would be sure to become a hearty subject of general conversation and of intensified fears; arousing the sleepers and keeping them awake. Of course, the sound of a waterfall or the rippling current of a stream must often be very variable, being dependent on the

volume of its water, the shape and size of its channel, and the strength and the way of the wind. In their making such remarks, the current or moving water would always be personified, which naturally augmented the amount of feelings. Indeed they have a very suitable verb, (*aumihi* = sympathizing speaking current,) only used on such occasions. This pleasing natural feeling they also anciently carried largely out into all their intercourse [13] with their native woods, villages, houses, canoes, old places of resort, plantations, &c, &c., on revisiting them; reciprocating the same with inanimate as well as animate nature, and showing the depth of their feelings by suitable impassioned words and gestures. True children of Nature!

While, however, I am on this subject, I may observe, (as I am not aware that any one has ever before done so,)— that to the highly imaginative mind, certain peculiar and strange combinations of lights and shades appear, come and go, and are repeated, in the breaking of the surf on the shore in some still moonlight nights, when the Moon is so situated in the heavens as to cast the proper amount of shadow on the foaming waters. I have not unfrequently noticed it, and it has served to remind me strongly of those fancied resemblances of countenances often of old observed in the burning dying embers of fires at Home, and affording themes of conversation.— Here, however, on the lone sea-beach the feeling is still stronger, whether accompanied by the melancholy cry of the wandering solitary Sanderling and the fitful wild night-breezes, or by that abnormal and undescribable tingling thrilling sound already mentioned.—

—“With me, through time, a changeless tone
 Of sadness like the night-wind’s is the strain
 Of what I have of feeling.”—

Also, in the beautiful poetic language of that gifted modern American poet Walt. Whitman:—

“The night in silence; under many a star; the ocean shore,
 And the husky whispering wave whose voice I know;
 And the soul turning to Thee:”—

Sometimes, on such occasions,—in such moments of utter loneliness—standing on the beach, *the only person there*, with the whole expanse of Hawke’s Bay before me,—I have been led to think of the famed African traveller Mungo Park, and of the death of the Explorer Capt. Clapperton in the African desert, and his burial in the sand by his faithful and only surviving attendant the young Cornishman, Lander, whom I also knew; for Lander, too, had “stood *alone!*” Some exquisite poetry was subsequently written upon that Desert scene; snatches of which, as,—

“*Alone!* on the desert wastes that lie,
 By the traveller’s foot uncrossed,
 Where the brave pass on through the wastes to die,
 Where the brave before were lost.”— [14]

And another (forgotten) verse, which ended,—

—“for I have stood alone!”⁵²⁵

525 WC: Appendix, Note C.

Such, and similarly suitable words would, at such times as I have mentioned, well-up from the depths of memory, and be feeling recited by me to the ever-sounding sea.— In fine: I conclude this portion of my paper in those justly-celebrated and imperishable words of one of our distinguished modern British poets.

“Alone, alone, all, all alone.
Alone on a wide wide sea!....

.....

O Reader kind! this soul hath been
Alone by a wide wide sea:
So lonely ‘twas that God himself
Scarce seemed there to be.”

Coleridge, “*Ancient Mariner*,” a little altered,

III. THE STORY OF THE OLD PRIEST KAE AND THE PET WHALE.

(*Abridged.*)

In the very olden time there was a great chief named Tinirau (= Many-hundreds), who dwelt on an island called Motutapu (Holy Isle). One of his three wives and the youngest named Hinauri was a waif from the ocean where she had long been floating about until she was enwrapped in sea-weeds and barnacles, in which state she was at last stranded on the sandy shore; there she was found and taken care of, and when she had been

recovered she became the wife of Tinirau.⁵²⁶ His two senior wives objected to this, and took up arms to kill her, but on their advancing towards her for that purpose, cursing her as they came along, she recited her powerful bewitching spell, through which they both fell immediately on their backs and died.⁵²⁷ In course of time her child was born, and Tinirau sought a skilful priest to perform the requisite ceremonies over a chiefs child. Hearing of Kae he was fetched by sea from his abode, (a place called Te-Tihi-o-Manono,) and he came to the town of Tinirarau, and did [15] all that was required, and the child, a boy, was named Tuhuruhuru (= Hairy-[or Feathered-] lord). The ceremony over, the usual great feast was given, when Tinirau called for his pet whale, named Tutunui (Big-gamboller), who was then away in the ocean disporting itself, and when it had run itself in near to the shore, a large portion of its fat side was sliced off, and baked nicely in the earth-oven for Kae. The old priest made a hearty meal, enjoying greatly the deliciousness of the fat flesh of the whale. After this Kae wished to return to his own place, and a canoe well-manned was got ready to take him thither, but he was not willing to enter the canoe, and so he remained there. This, however, was but a bit of deceit on the part of Kae;

526 WC: This “waif from the ocean” is the same person who had committed suicide, (page 8, ante): she, however, after long floating and drifting had become the wife of two men who had found her and restored her to life; these subsequently took her to their superior chief Tinirau.

527 WC: The spell is also given; the translation however would convey nothing to a Western ear without much and long interpretation.

a cunning stratagem played by him that he might return riding on the pet whale's back; for he had both heard of its great usefulness in this way to its Master and had also tasted of the sweetness of the flesh of that fine fish. At length Tinirau consented, and lent him Tutunui to serve as a canoe to carry him home through the sea; at the same time giving Kae precise instructions how to act, saying,—“When thou art nearing the shore and the fish begins to shake itself, then be quick and jump off on the right side.” Soon after Kae left Motutapu, and went on fleetly and jollily through the sea; on nearing the shore of his own place, the big fish began to shake itself in order that Kae might jump off and go on shore, but Kae would not do so, he kept his seat on the fish and repeated his spells and pressed it down in shallow water on to the sands, where its spout-holes soon got filled with sand and gravel, and the fish died. Then Kae directed his people, and they dragged the whale on shore to feast on, being such delicious food. They cut up the whale and baked its flesh in their earth-ovens, using the fresh leafy green twigs and branchlets of the Koromiko shrubs (*Veronica salicifolia*) as wrappings for the rich fat junks; hence it is that to this day the oil has ever remained in those branches of the Koromiko, and from that circumstance arose the old adage of our fathers,—“Behold the fragrant oil of Tutunui!” (A saying often spoken when those branches are used by the Maori for similar cooking purposes, the shrub being everywhere very common; and its clean smooth inodorous leaves highly fitting it for such a use, and when freshly taken off from the cooked food [16] they present a wet glistening oily appearance.) Tinirau waited for the return of his big pet Tutunui, he

waited however in vain. Some time had passed, and he began to say anxiously to himself, ““Wherever can it be? so long away.”” By-and-by, when the main cooking of the whale for storing was done, and the large ovens were uncovered, the wind being in the right direction wafted the rich smell of the baked fat right away on to Motutapu, and both Tinirau and his wife smelt it, and knew that their pet (lately given to their first-born son Tuheruhuru) had been killed and eaten by Kae and his people.

Then it was that after due consultation the big canoe of Hineiteiwaiwa, the sister of Tinirau, was launched and got ready.⁵²⁸ Forty women were told off to go on board, among them were the following great ladies besides Hineiteiwaiwa, herself, viz., Raukatauri, Raukatamea, Itiiti, Rekareka, and Ruahau-a-Tangaroa; only women were to go in the canoe to lull any suspicion as to the cause of their coming. On leaving Motutapu, Tinirau’s sister asked him, “What is the particular mark or sign by which Kae may be surely known?” and Tinirau replied, “By his large broken cross teeth;” so they paddled away. On landing at Kae’s place they were well received by the people, who gathered from all neighbouring parts to see and admire the strangers. In the evening the usual fires were lit up in Kae’s large house of assembly, and there the people all collected together with the visitors, and on their doing so, one whole side of the building (according to Maori custom) was allotted to the stranger guests.

528 WC: Their best canoes were always kept hauled up high and dry, place on logs with skids, and under cover, and often dismantled; at all events it always took some considerable time to refit them.

Now Kae's own place was at the foot of the central column. Then Raukatauri and her party showed their skill at amusements; they sang their songs with appropriate action, made music on their different kinds of flutes and fifes, they performed many tricks of dexterity with their hands and fingers and rods, after the popular Maori customs, all of which took a long time, but still Kae never once joined in the merry general laugh. Then those women began to consider among themselves, while sitting and resting awhile, "Whatever more shall we do to make Kae laugh?" (This they said, because they were not quite sure which, of the chiefs in the big house was [17] Kae; and it was contrary to all Maori etiquette for visitors to ask the names of persons of the place, visited.) At last they hit on a plan, which proved successful; and all those women got up to perform it,—a lively kind of joyous dance full of antics and outrageous gesticulation, singing, also, words in unison. And on their coming to the end of it, which was very jocular and rollicking, Kae could no longer contain himself but, burst out into a hearty and long laugh. Then it was that they clearly saw his teeth, and knew for certain that the man sitting by the centre post was Kae. (And hence this proverb has been handed down to us from our forefathers, whenever any sullen moody person laughs at the word or doings of another, then some one present is sure to say, "*Ka kata a Kae!*" = "Kae laughs!")

After this, the night being advanced and the performances over, the fires were extinguished, and preparations made for sleeping. The wily old priest, however, was in part suspicious, therefore he took two round pieces of mother-of-pearl shell (*Haliotis iris*), and

cunningly fixed them into the orbits of his eyes, that those women visitors might be led to believe he was still awake, from the glistening of the pearly shells. (For, according to Maori custom, he could not know the reason of their visit until they should choose to inform him, which might not be for some days.) The women, however, were on the alert; they secretly performed their spells, and sent the whole house into a deep sleep, Kae also. Then they arose, and having got their canoe ready afloat, they all came and formed themselves into a long line leading from the door of Kae's house to their canoe, standing in pairs at equal distances. This done, two of them entered the house and took up Kae fast asleep in his mats, and passed him on carefully from hand to hand until he was fairly placed on board of their canoe, when they performed another deep-sleeping spell over him, and so carried him off. On their arriving at Motutapu, Kae, still soundly asleep, was carefully taken up, carried and placed at the foot of the central column in the big house of Tinirau.

Now Kae's house was of circular form, and Tinirau's house was long and angular. Kae being thus secured, Tinirau instructed his people, how to act in the early morning: saying??:— [18] “When I go out of my sleeping-house in the early morning, do you all set up the usual loud cry of welcome to a visitor, and say, ‘Here comes Tinirau!’ ‘Here is Tinirau!’ As if I were a visitor just landing.”—So at broad day-light Tinirau went forth from his sleeping-house, and the loud cry was set up, “Here comes Tinirau! here is Tinirau!” (as if he, were a visitor chief loudly welcomed on his arrival.) Kae hearing this noise awoke up from his sound deep, and sat up on his

mats. Tinirau went forward and sat down outside at the verandah entrance into the big house where Kae was; there he saluted Kae, in the usual manner, saying, "Greeting to thee, O Kae;" and adding, "Who brought thee hither to this place?" On this Kae replied, (thinking he was in his own place and house,) "Nay: rather let me ask, Who brought thee hither?" Tinirau rejoined, "Look, and see the form of this house." Kae did so; and said to Tinirau, "This is my own house." Tinirau, then said, "Whereabouts is the window placed in thy house?" Kae turned and looked, and then he knew from the different appearance of the house that it was Tinirau's, saying—"Verily, so it is, this is Tinirau's own house!" Then he bowed down his head, well-knowing his fate.⁵²⁹

So they dragged him forth and immediately killed him—When Kae's people heard of it they made great preparations to avenge the death of Kae; they collected together and came over in large bodies to Motutapu; there they fought several times, and at last succeeded in killing Tinirau's son Tuhuruhuru, but not till after he had grown up and had married, and had sons born to him. And then Tinirau went to work to avenge the death of his son Tuhuruhuru; and so a deadly exterminating war was carried on, ending in the destruction of many on both sides.

529 WC: In accordance with the national custom of the Maoris, to submit quietly without a word or struggle to the inevitable.

IV. Of the ancient story of the brothers, WAIHUKA AND TUTEAMOAMO.

(An extract only, the story being long.)

Those two brothers grew up to manhood, but they had no parents, nor relatives, nor tribe. The younger was named Waihuka (= Snow- or Foaming-water), the elder Tuteamoamo, [19] (a compound word, which may mean, The Spy-(who-was-) borne on-the-shoulder: as we carry a gun.) The younger took to wife a very beautiful woman, named Hineitekakara (= Fragrant Lady), she was most remarkable for her extreme beauty and was greatly admired. In a little time the elder brother became envious of his younger brother, on account of his handsome wife; saying to himself, "Why should he (the younger) have her?"⁵³⁰ How shall I manage to obtain possession of her?" For a long time he could not devise a fitting plan; at last he thought he would drown his brother, when they should be out in their canoe to the deep-sea fishing. One day they went out together as usual to the fishing-ground, where the large cod-fish were plentiful; a long way out at sea so that the land was lost sight of. There they fished, and having good luck soon filled their canoe; when they thought of returning. Then the elder told the younger, who was in the bow of the canoe, to haul up the anchor; he tried, but could not. On this, after some little

530 WC: With the New Zealanders the first-born was everything! (much as with the ancient Jews, and, unfortunately, too often with ourselves:) those brothers and sisters who came after (unless of greater rank on the mother's side, additional wife), were little better than his (or her) slaves. This must be borne in mind in reading this story.

altercation between them, the elder told the younger to dive down and set it free, which he did; and then the elder cut the rope, up sail, and left the fishing-ground for the shore. The younger one on rising to the surface implored his brother to return for him; but to no avail, he only mocked him. The younger was now drifting on the sea, and he considered what he should do. So he first recited his spells and invocations to the Maori gods (*nga atua*) or supernatural powers; he also called on the various big sea-birds hovering and swimming around,—on the Gannet, the Gull, and the Shag,—to take him to the land; but they paid no attention to his words.⁵³¹ He then called on the several big fishes to save him, but none responded, until at last he called on the Whale. Now this whale was the pet of that famed chief Tinirau, the great lord of the isles of the sea; and moreover the whale was related to the young man Waihuka through his ancestor. The word had no sooner escaped from Waihuka's lips—“O Whale! carry me to the shore;” than the [20] obedient whale was at his side, nestling quite close up; so he got on to its back, and was taken in safety to the shore.

The remainder of this story, though highly interesting, especially to a Maori audience, is too long to be given here. Waihuka, however, was not landed by the whale at his own place of abode, The elder brother having returned told his plausible story, and the death by accidental drowning of the younger brother. He did this to carry out his nefarious scheme. In all his attempts, however, he was repeatedly baulked by the widow, ever

531 WC: So Paikea, in a similar situation. See the forthcoming Story.

on her guard; who, in a few days, wandering and mourning by the sea-side in hopes of finding the body of her late husband, suddenly came upon him alive and well! Their joy was great. He privately got back to their own house unknown to the elder brother, and there he prepared himself by dressing and arming for the elder brother's usual nightly visit of annoyance to the young lady; and on his coming and forcibly entering the house, the younger brother fell on him and killed him. (In his so acting he would be in unison with Maori custom.)

The ancient Maoris possessed a great number of Fables; most of them exceedingly natural, and many very superior. Being greatly attached to pet animals, and close observers of Nature, they managed their Fables very adroitly. Unfortunately they had no Quadrupeds,— or nearly none, only a small domestic Dog, a Rat, a Bat, and a large Lizard;⁵³² had they more they might have rivalled Æsop himself with their useful and amusing tales. With them, as with all ancient peoples, it was a common thing for the animals, small and large, land and sea, to speak, to converse rationally, often wittily and ironically, and to obey man.⁵³³ Lest, however, any one of my audience should be inclined to say,—“What a strange notion! a whale to obediently carry a man through the sea!”⁵³⁴

532 WC: They had, also, several very small lizards, but these were of no account.

533 WC: Appendix, Note D.

534 WC: Shakespeare, however, makes Oberon (King of the fairies) to say something very similar, but more natural it may be, to the fairy Puck; thus:—

“My gentle Puck, some hither. Thou remember’st

I will also relate some similar doings nearer Home, in the old and long civilized lands of the West. [21]

V. ATTESTED STORIES OF DOLPHINS CARRYING MEN THROUGH THE SEA, FROM ANCIENT HISTORY.

First, there is the well-known story of Arion being saved from drowning in the Mediterranean sea by a Dolphin, and his riding on its back in safety to shore.⁵³⁵

The father of ancient History, Herodotus, (already quoted by me in the early part of this paper,) gives a pretty full account of it, from which I will make a short abstract,—

Since once I sat upon a promontory,
And heard a mermaid on a dolphin's back,
Uttering such dulcet and harmonious breath,
That the rude sea grew civil at her song;
And certain stars shot madly from their spheres
To hear the sea-maid's music,
Puck. I remember."

—*Midsummer Night's Dream*, Act ii, sc.1.

535 WC: Here, also, Shakespeare skilfully uses this circumstance, in the consoling speech he makes the captain of the wrecked ship say to Viola:—

—“I saw your brother,
Most provident in peril, bind himself
To a strong mast that lived upon the sea;
Where, like Anon on the dolphin's back,
I saw him hold acquaintance with the waves
As long as I could see.”

—*Twelfth Night*, act i, sc.2]

—“A most wonderful incident is said by the Corinthians to have happened when Periander was king,⁵³⁶ and this story is confirmed by the Lesbians. It is asserted, that Arion the Methymnaean was carried to Tænarus on the back of a dolphin; he excelled all his contemporaries in his exquisite performance on the harp. After residing some time at the court of Periander, he was desirous of visiting Italy and Sicily. Acquiring there considerable wealth, he wished to return to Corinth, and embarked at Tarentum in a Corinthian vessel. At sea the sailors determined to kill him for his riches; he, discerning their intentions, offered them his money to preserve his life. They, however, were obdurate, and insisted, he should either kill himself, that they might bury him on shore, or leap instantly into the sea. Reduced to extremities, he entreated, to be allowed to decorate himself in his best, and to give them a specimen of his art in singing and playing. They consented to this, so Arion dressed himself, and sang and played standing on the side of the ship, and as soon as he had finished his song he leaped into the sea. The sailors went on to Corinth. Arion was taken up by a dolphin, and carried to Tænarus. As soon as he got on shore he [22] went without changing his dress to Periander, who, at first, disbelieved his story; but kept him in safe custody until he had found out the crew. This he soon did; and at length they confessed their crime. There now remains at Tænarus a small figure in brass of a man seated on a dolphin’s back, the votive offering of Arion himself.”—Bk. i, *Clio*, ch. xxiii, xxiv.

536 WC: Peniander died B.C. 485.

This story is also related by several other ancient writers; Solinus (chap. 7,) tells us, that there was a temple of Arion of Methymna on this spot (now Cape Matapan), in which there was a figure of him seated on a dolphin's back made of bronze, with an inscription, stating, that this wonderful circumstance took place in the 29th Olympiad, in which year Arion had been victorious in the Sicilian games.

The longer and more elegant relation of this tale is the poetical one by Ovid;⁵³⁷ to this I would refer you; at the same time I will give a private metrical translation of it, made by a gentleman in England many years ago in the Scottish dialect; the rendering is good, and there is an air of novelty and charming simplicity about it, which to me is pleasing.⁵³⁸

Arion's adventure with the Dolphin may be truly deemed to be mythical and to belong to the night of history as much as Tinirau's pet whale. But what then will be said to the following instances, which, almost equally startling, are affirmed to be true.—

The celebrated Roman historian Pliny, (who was killed by the eruption from Mount Vesuvius which also destroyed the towns of Herculaneum and Pompeii, in A.D. 79,) in writing on the Dolphin, states:—"In the reign of the late Emperor Augustus, a dolphin which had been carried to the Lucrine Lake conceived a most wonderful affection for the child of a certain poor man, who was in the habit of going that way from Baiae to Puteoli to

537 WC: *Fasti*. book ii. 1.92, *et seq.*

538 WC: Appendix, Note E.

school, and who used to stop there in the middle of the day, call him by his name of Simo,⁵³⁹ and would often entice him to the banks of the lake with pieces of bread he carried for that purpose. I should really have felt ashamed to mention [23] this, had not the incident been stated in writing in the works of Mæcenas, Fabianus, Flavius Alfius, and many others.⁵⁴⁰ At whatever hour of the day he might happen to be called by the boy, and although hidden and out of sight at the bottom of the water, he would instantly fly to the surface, and after feeding from his hand, would present his back for him to mount, taking care to conceal the spiny projection of his fins in their sheath, as it were; and so, sportively taking him up on his back, he would carry him over a wide expanse of sea to the school at Puteoli, and in a similar manner bring him back again. This happened for several years, until at last the boy happened to fall ill of some malady, and died. The dolphin, however, still came to the spot as usual, with a sorrowful air, and manifesting every sign of deep affliction, until at last, a thing of which no one felt the slightest doubt, he died purely of sorrow and regret.”

“Before this there was a similar story told of a child at the city of Jasus, for whom a dolphin was long observed

539 WC: From Lat. “*Simus.*” or flat-nosed. Pliny further says—“the nose of the dolphin is turned-up: for this reason it is that they all recognize in a most surprising manner the name of Simo, and prefer to be called by that rather than by any other.” (*loc. cit. ch.7.*)

540 WC: *Ælian, Hist. Anim.*, book vi, c. 15, tells this story as well; and *Aulus Gellius*, book vii, c. 8, relates it from the fifth book of the *Ægyptiaca* of Apion, who stated that he himself had witnessed the fact.

to have conceived a most ardent affection, until at last, as the animal was eagerly following him as he was making for the shore, it was carried by the tide on the sands and there expired. Alexander the Great appointed this boy⁵⁴¹ high priest of Neptune at Babylon, interpreting this extraordinary attachment as a convincing proof of the favour of that divinity.—

“Hegesidemus has also informed us, that in the same city of Jasus there was another boy also, Hermias by name,⁵⁴² who in a similar manner used to traverse the sea on a dolphin’s back, but that on one occasion a tempest suddenly arising, he lost his life and was brought back dead; upon which, the dolphin, who thus admitted that he had been the cause of his death would not return to the sea, but lay down upon the dry land and there expired.”

“Theophrastus informs us, that the very same thing happened at Naupactus also; nor, in fact, is there any limit to similar instances. The Amphiliocians and the Tarentines have similar [24] stories also about children and dolphins; and all these give an air of credibility to the one that is told of Arion, the famous performer on the lyre .”*Nat. Hist.*, bk. ix, ch. 8.

To this, Pliny’s equally famous nephew, Pliny the younger, in his charming letters, adds another strange story, which is worth extracting; the more so, as probably

541 WC: Athenæus, book xiii, tells this story more at large, and states that the name of the child was Dionysius.

542 WC: This story is also told by Plutarch, in his work on the Instincts of Animals.

the work is not common among us.—It is in his letter to Caninius.

“There is in Africa a colonial town named Hippo, close to the sea. Adjoining it is a navigable lagoon, out of which flows an estuary in the manner of a river, whose waters are alternately carried to the sea or returned to the lagoon, according as they are driven back or impelled by the tide. The inhabitants of every age are strongly addicted to fishing, boating, and likewise swimming; particularly the boys who are attracted by idleness and sport. In their eyes, it is glory and renown to swim out a long way; the victor is he who has left the shore, as well as his fellows, the furthest distance behind him. In this kind of contest, a certain lad, bolder than the rest, was getting far out to sea. Suddenly a dolphin met him, and at one time went in front of, at another followed, and then swam round him, at last took him on his back, then put him off, then took him on again, next bore the trembling lad seaward, and presently turning back to the shore, restored him to terra firma and his companions.

The report of this crept through the town; all the inhabitants flocked up and contemplated the lad himself as a kind of prodigy, they questioned him, and listened to him and repeated his story. Next day they took possession of the shore, and gazed upon the sea, the lagoon, and the estuary. The boys swam, and among them the one in question, but with greater caution. Again to time came the dolphin, and again he made for the boy, who fled with his companions. The dolphin, as though inviting and recalling him, leapt out of the water, and dived and twined and untwined himself in a variety of

circles. The same thing happened the next day, and a third day, and on several days, till these men brought up to the sea, began to be ashamed of their fears. They approached and called to him jestingly; they even handled him, and he submitted to be stroked. Their boldness grew by use. But before all others, the boy who had had first experience of him, swam by him, [25] jumped on his back, was carried to and fro, and, fancying he was recognized and loved by him, was himself taken with love for the dolphin. Neither of them is afraid, neither is an object of fear, the confidence of one and the tameness of the other go on increasing. Other boys too, on the right and left, swim with their friend, cheering and exhorting him. What is also marvellous, another dolphin accompanied this one, but only in the character of a spectator and attendant, for he neither performed nor submitted to anything of the same kind; he merely led the other and escorted him back, just as the rest of the boys did with this boy. Though it seems incredible (yet it is just as true as what has preceded), this dolphin that carried and played with boys would often leave his element for the land, and after drying himself in the sands, would, as soon as he had grown warm, roll back into the sea. It is ascertained that Octavius Avitus the Pro-consular Legate, led by a vicious superstition, poured ointment on him after he had been attracted to the shore, and that the strangeness of the thing and the smell caused him to escape back into the deep, and that he was not seen for many days afterwards, and then languid and dull; yet soon afterwards he regained his spirits, and resumed his former friskiness and his accustomed offices. There was a confluence of all the officials of the

province to see the sight, whose arrival and sojourn were exhausting the modest revenues of the town in unwonted expenses. Finally, the place itself, was parting with its repose and retired character. It was decided to put to death privately the object of all this assemblage.⁵⁴³

“With what tender commiseration, with what exuberance, will you weep over and embellish and exalt this tale! There is, however, no need for your inventing or adding anything fresh to it. It will suffice if what is true suffer no diminution—*Book ix*, let. 33.

Later still we have the testimony of the celebrated orator and historian Pausanias, (A.D. 170,) in his full “Description of Greece” in ten books; in which he tersely relates what he had both seen and heard in his travels throughout the Grecian States, and as his work is but little known, I give a few extracts from it. Writing on Tænarum (mentioned p. 23), he says:— [26]

There are several works of art at Tænarum, and among others the harper Arion in brass, riding on the dolphin’s back. As to Arion and the dolphin, Herodotus has given the tradition as he heard it in his history about Lydia. I have myself seen at Poroselene a dolphin so full of gratitude to a boy, by whom he had been healed of wounds received from some fishermen, that he was obedient to his call, and carried him on his back over the sea whenever he wished”—*Book iii*, ch. 25.

And in his travels through other cities, he mentions having seen statues of famous men with effigies of

543 WC: This story is also related by Pliny in his *Nat. Hist.*, (*l.c.*.,) and also by Oppian, in his *Halleutica*, book v.

dolphins, erected by the Greeks to commemorate similar deliverances: for instance, at Delphi; he says:— “I saw the statue of Opis king of the Iapyges, and standing by him the hero Taras and the Lacedemonian Phalanthus and at no great distance a dolphin: for Phalanthus before he went to Italy suffered shipwreck in the Orissæan Gulf, and was they say brought safe to shore by a dolphin.”— *Loc. cit.*, bk. x, ch. 13.

And again, in describing Corinth, he says:— “With regard to the Molurian rock—Ino threw herself into the sea from it with Melicerta the younger of her sons.... And the boy, being carried it is said by a dolphin to the Isthmus of Corinth, had various honours paid to him under the name of Palæmon, and the Isthmian Games were celebrated in his honour.”—*Loc. cit.*, bk. ii, ch. 44.

Strange, however, as those stories from the two Plinies and other secular historians must seem, there is yet a still more strange though precisely similar one to be found in ancient Church History. ‘In the “Epitome of the Ecclesiastical History of Philostorgius,” compiled by Photius Patriarch of Constantinople, (who filled that patriarchal see in 853,) we have the following brief narration.—

“He says, that Helen the mother of the Emperor, built the city that was called Helenopolis at the entrance of the gulf of Nicomedia and that the reason of her great predilection for the spot, was because the body of the martyr Lucian was carried thither by a dolphin after death by martyrdom.”—*Book ii*, ch. 12.

But this anomalous action is only a faint specimen of the many and great wonders of those early days, as related

and [27] affirmed by the most eminent Church writers and historians, including even Jerome and Augustine!

Such stories and marvellous statements, especially by Church writers, irresistibly draws one's mind to another with which we are all more familiar, namely that of Jonah and the Whale; that is, of the mere accidents, or dress, of this Oriental apologue. I do not refer to the basis, the kernel, the grand early lessons and moral truths pertaining to it, these will ever stand, and ever, I trust, be thankfully appreciated.

One word more in conclusion:—I have already alluded to the wonderful fictions of the ancient Jewish Rabbins—the Teachers and Doctors of the early Church, respecting the Leviathan. Here, also, in the matter of “Jonah’s whale” their recorded relations and opinions are equally astonishing. Take a sample:—one (in the Targum, *Yalkut Jon.* §550,) being, that Jonah was enabled to see through the whale’s eyes; that the monster had within a large jewel luminous as the Sun; that Jonah was carried to the Red Sea, to see the ground the Children of Israel had passed over; and also, that while thus confined, the meeting of the great fish with Leviathan is circumstantially related. Another statement being, that Jonah was first swallowed by a male fish, where he had plenty of room within, but as he took it rather easy and did not pray, he was transferred into a female fish, which had within her 365,000 myriads of young embryos that distressed him so much that he began to pray; while another Jewish interpreter, Rabbi Bechai, says:—“though that fish was indeed large, there were in the sea many larger fishes; but it had been ordained for this

object from the six days of creation.... And when it had swallowed Jonah and had thus fulfilled the appointed purpose for which alone it had been called into existence, it died." *Credat Iudeus!*

To the foregoing I may fittingly append a remark of Luther's:—

—"Who can really imagine that a man should live three days and three nights so lonely, without light and food, in the midst of the sea within a fish, and should then be restored? That must have been a strange voyage: who would believe the story, and not rather consider it a fiction or a fairy tale (eine Lüge oder Mährlein), were it not found in Scripture?"—Werke, ed. Walch, p. 2641.

[28]

I would, however, again observe,—that "while the details, the dress, of a legend are always false," and not unfrequently variously fashioned and contrived, "the legend itself contains a kernel of truth; a mere invention never becomes a legend."—"Trans N. Z. Inst." vol. xiv, p. 25.) For the ideals of a people are more important in estimating its real character than its actual deeds, as may be seen in the following interesting ancient Maori story.

VI. THE STORY OF PAIKEA AND RUATAPU.

*[Read before the Hawke's Bay Philosophical Institute.
12th June, 1881]*

This is a very ancient story. In the olden time, about 25 generations back,⁵⁴⁴ or (say) A.D. 1000,—time of our Danish Kings; a powerful chief named Uenuku dwelt here on the East Coast of New Zealand, between Table and East Capes. His descendants are still residing there, who, also, rest their claims to their ancestral estates through their being such. The beginning however of their genealogical line goes much further back.

I may also add that this remarkable traditional story I have received in two separate narrations from two sources; and, further, that they wonderfully agree in all their main points, including, also, the charms, spells, and invocations used.—

Many and great and long-continued were the desolating wars in which Uenuku was engaged, and in all of them he seemed to have come off eventually the victor. No doubt he was a clever strategist as well as a daring fellow. And being a great priest (*tohunga*) as well as a Chief of high rank, his name became doubly renowned and dreaded. This Maori story begins thus:—

Many years after those rightings Uenuku got a large canoe made; Haeora was the name of the skilful man who made it; and Te Huripureiata was the name of that canoe. When the canoe was built and finished, it was painted red, and fully ornamented with pigeons' feathers, and all its many adornments. All this took a long time. Then it was that Uenuku ordered his sons, and the sons of

544 WC: One of the genealogies gives 28 generations, (viz., three additional names.) This may be owing to an early branch, commencing with the son of another wife.

other chiefs, to assemble, in order that [29] the hair of their heads might be combed and anointed and neatly tied up in a knot on the crown, and ornamented with a high dress comb stuck in behind (worn only by chiefs), so as to be regular and look beautiful,⁵⁴⁵ that they might all go together and paddle the new canoe out to sea. Uenuku himself performed this work of preparing and dressing and tying-up their hair.⁵⁴⁶ Those young men were seventy in number, all told, and Uenuku finished with Kahutiaterangi. All the seventy were fine able young men; there was not a boy among them. When all were done, Ruatapu called out to his father,— “O, honoured sir, see! tie up and dress my hair also.” Uenuku replied to Ruatapu,— “Wherever shall a dress-comb be found for thy hair?” Ruatapu rejoined, — “Why not use one of those combs there by thee?” Then Uenuku said,— “Why dost thou not ornament thy hair with one of the combs of thy elder brothers?” On hearing that, Ruatapu cried out,— ”O noble sir, O noble sir, I was supposing that I was indeed thine own (son)! but now I perceive that I am

545 WC: Plenty of patterns of their hair so adorned are given in the plates ol Cook's “*Voyages*,” and in Parkinson's “*Journal*,”— *passim*. (See *Proverb*, No. 130, “*Trans. N.Z. Inst.*,” vol. xii, p. 133.) When their heads were thus dressed they did not lay them down on pillows of any kind for several nights, lest they should disarrange them, but managed accordingly. This curious practice was also largely followed by other Polynesians. So in Africa, and, also, very anciently in Europe. (See Keller's “*Lake Dwellings of Switzerland*,” pp. 175, 501, 565).

546 WC: This ceremony was always performed by a chief of rank, or by a priest (*tohunga*); Uenuku was both; the head being pre-eminently sacred (*tapu*), and never to be touched save by a tapu person.

not thine!" Then his father said to him,— "O, sir,⁵⁴⁷ thou art indeed verily my own (son); but a son of little consequence, an offspring of inferior birth:" (meaning, that his mother was of no rank, being only a slave saved alive in war).⁵⁴⁸ At this saying of Uenuku, Ruatapu was completely overcome with shame, and his whole heart was filled with grief and pain, and, loudly lamenting, he went away to the place where the canoe was, planning in his mind how he should best accomplish the murder of Uenuku's favourite sons, his elder brothers. He soon hit upon a plan; he got a stone chisel and he worked away with it at the bottom of the new canoe, until he had cut a hole through, which, when done, he plugged up and hid with wooden chips [30] and scrapings, so, that it should not be seen. Then he went back into the town, but he would not eat any food, for his heart was still deeply grieved at the lowering words which his father had used respecting him. The next morning early Ruatapu went and aroused and brought together the men of the place to drag the new canoe down to the sea. They all came and she was soon afloat, and then those young chiefs, seventy in number, who had been already prepared for that duty, entered on board of the canoe he himself taking care that no boys⁵⁴⁹ embarked with them, for some who came to do so he returned to their home. The canoe being well manned with smart paddlers, and all being ready, away

547 WC: I have sought to keep up in a translation the great difference in the modes of address here used between the father and son.

548 WC: Appendix, Note F.

549 WC: The word may mean—*younger sons*.

they paddled; Ruatapu himself going with them, seating himself in his own place on board, and keeping the heel of his foot firmly fixed on the hole which he had bored in her bottom. They paddled a very long way out to sea, when Ruatapu removed his foot from the hole, and the water rushed in. On seeing the water in the bottom of the canoe they cried out, "We shall be upset! turn her round to the shore!" but Ruatapu again fixing his heel on the hole, and also baling out the water, the canoe was soon free from it. They still paddled away further out, when some said, "Let us now return, for we have paddled to a very great distance." On hearing this, Ruatapu answered, "We will soon return; let us first go a little further out." So away they paddled, until they had got quite out of sight of land; then he again removed his heel from the hole, and the water rushed in! All immediately called out, "Where is the baler? hasten; bale out the water; we are lost!" But Ruatapu had hidden the baler; and soon the canoe was filled with water and upset.⁵⁵⁰ Then Ruatapu made after his brothers, and quickly drowned several of them by plunging them under. Having done so, and seeing Paikea still swimming, he followed hard after him to drown him also; but Paikea repeatedly evaded him. At last Ruatapu said to Paikea, "Which of us two shall carry the tidings of our disaster to land?" And Paikea replied, "I will, for I can do it; for I am also a son of (or descended from) the sea." And this was both the reason of his so saying and of his escaping drowning—Paikea being [31] descended from Rongomaitahanui, who was also descended from Te Petipeti, and Te Rangahua. Then

550 WC: See Proverb, No. 181, "*Trans. N.Z. Inst.*, vol. xii. p. 110.

Ruatapu cried out, “Go thou, swim away to the land; and note well, if I am lost here, then thou wilt surely know that I am not descended from our father; but if I escape from this calamity, then, verily, I am from our father. Go thou on; let the crowded parties of the summer season ever remember me, that I am also there, (I) shall not be hidden. When the squid and the jelly-fishes shall have reached the sandy beaches (in the summer season), then look out, I am but a little way behind them, going also towards the shore. Go on, swim away, proceed thou to the land; those who should be the survivors from this wreck (are) become as a pile of slain in a day of bloody battle. This is another word of mine to thee, Let Kahutuanui have the striking-up of the song, so that when (ye), the ample broad-chested, may be sttting closely together in a row by the side of the fire,⁵⁵¹ it shall be sung in parts—in fruitful seasons and in unfruitful ones,—at the times of assembling together in companies, and at the times of living together separately (in families); through this I shall ever be remembered.” Then Paikea said, “The tidings of our calamity shall be safely carried by me to our town, for I am verily descended from (those of) the sea,—Te Petipeti, Te Rangahua, and Te Aihumoana⁵⁵² being my ancestors.” Here Ruatapu

551 WC: For the common regular diversions of the evening, when the fires were lighted in their large houses.

552 WC: Paikea has now twice firmly asserted his descent from (beings of) the sea,—and he is not the first of the ancient Maori heroes who has done so. Of those four names of his ancestors here given by him, all are found in the Genealogical Roll; hut the first (Rongomaitahanui) and the last (Te Aihumoana) are, also, mythically known as ancient sea-demons (*atua*), and, so far, pre-

gave his last parting words to Paikea, "Go on, swim away to land, to the dear old home!" and so saying he held up his paddle.⁵⁵³ So Paikea proceeded on, swimming on towards the land, reciting as he went his powerful spell; and this was it:—[32]

1. Now shall be shown, now revealed, the rigour of the trembling heart; now shall be known the force of the anxious heart; now shall be seen the strength of the fluttering weak female heart.⁵⁵⁴
2. The big fish of the sea swims fleetly through strenuous exertion; blowing forth the blasts of sea-water from (its) nostrils; the big fish is lifted above the waters.
3. Space⁵⁵⁵ makes (it) buoyant; Sky upheaves (it) above the swell of Ocean.
4. Now, rushing forwards, a steep descent; anon (as if) climbing the fence of a fort! now a toughening squall of wind comes on; anon, as a bird's feather borne before it.
5. Ha! ha! thy heart (even as, or one with) my heart.

historical. Paikea is also the proper name of a species of whale. (See Note, p.8.)

553 WC: There is a meaning here in this action of Ruatapu which should not be overlooked. To retain one's paddle (which was often highly carved and ornamented), in upsettings of canoes and in naval fights, was always an achievement, and a token of bravery, etc. Just as that of a young Spartan to retain his shield, or, in modern times, the colours, arms, etc.

554 WC: The very opposite feelings are to be here understood. See note G. Appendix.

555 WC: For Space and Sky, see Appendix, Note H.

6. Now the great enduring courageous heart of (the descendant from the) Sky, shall make itself to emerge through all difficulties and dangers to the habitable, to dwellings (of) light.
7. A full deliverance (for the) son of a chief, who was properly begotten the son of a chief.
8. Son above; son abroad; son according to the proper ceremonies (rightly or duly) performed; son according to the sign of the breaking-away of clouds, enlightening hitherwards from the outermost sides of the far-off horizon.⁵⁵⁶
9. Ha! abroad, far away on the deep (is) verily the place to exert strength, showing the straining of (one's) sinews.
10. Here, now, (is) the skid, I mount up on the top (of it); the very skid of Houtaiki;⁵⁵⁷ the skid satisfying the heart; the skid (that is) sure and fast.
11. Ha! ha! the cold wind (is) laughed at, defied; (so is) the cutting icy wind to the skin; so (is) the bitter cold

556 WC: Appendix, Note I.

557 WC: "The skid of Houtaiki." Houtaiki is the name of one of Paikea's ancestors. Here, however, an allusion is made to the canoe of Houtaiki getting safely drawn up on its skids on the shore; it is a very ancient story. It was also used to denote a fixed safe barrier, or bounds, which were not to be passed, as at Taupo, etc.; and, also, known as te puru o Houtaiki—i.e., stoppage, obstacle, barrier. Te rango o Houtaiki is one of the names of the low isthmus connecting Table Cape Peninsula with the mainland. The name of Houtaiki often occurs in poetry, in connection with that of Houmea.

penetrating and numbing vapour; and so the fainting internal feeling of sickness.

12. Here (is) the skid! I get up on (it); verily the same skid of Houtaiki greatly desired and looked for.
13. Once, twice, thrice, four times, five times, six times, seven times, eight times, nine times, ten times.
14. Let not the fastening roots of Taane be unloosed by thee: let not the hateful ill-omened winds to Taane be set free by thee.⁵⁵⁸ [33]
15. Let the swimmings of a man in the ocean finally end; (let him) emerge at the habitable regions, at the lightsome (and) joyous dwellings.
16. Take up this descendant (of a line of chiefs); behold! he lives (he) swims bravely.
17. Lo! he swims; the head first-born chief keeps pursuing; he follows on still swimming away.
18. Lo! he swims; behold! he swims strongly; still swimming onwards, enabled, enduring.
19. A head first-born chief follows on; still keeping at the swimming; lo! he swims.
20. Behold! he swims away, even Paikea (a) first-born chief, who keeps going forwards, still keeping on swimming.

558 WC: Taane, the owner and creator of forests; here metonymically used;—“roots of Taane”—i.e., of the trees of the forests. The strong westerly winds which often blow furiously in summer, sweeping down from the wooded heights and off the shore, East Coast, are here deprecated.

21. Lo! he swims: behold he swims; upborne he swims;
upborne he continues; he keeps at it, swimming onwards,
toiling manfully.
22. Now above (the surface), then below! anon rolling
between the billows; all that ends in the very reaching of
the shore by Taane himself.⁵⁵⁹
23. Lo! look out! there it is; coming onwards towards
(me), like a huge rolling wave. Ugh! strike it down! fell
it! with the famed axe of ancient times,—that which
overturned the land.
24. Lo! Ha! his own mighty first-born chief appears (to
his succour); that is Rongomaruawhatu,⁵⁶⁰ therefore it
(the big) overwhelming wave, fled away, far off; ha!
25. The plugging and caulking stands good.
26. The fixing and lashing together stands good.⁵⁶¹
27. Let (him or it) be uplifted and carefully carried.
28. Let (him or it) be raised and supported.
29. Let (him or it) be borne along?⁵⁶²
30. Alas! my distress, making me to toil laboriously at
swimming; here, indeed, it is now being seen.

559 WC: Figurative, for a wooden canoe made out of a forest tree.

560 WC: One of Paikea's ancestors.

561 WC: These two verses (25 and 26) are spoken of a canoe.

562 WC: These last three verses (27-29) may mean, either Paikea, or
the canoe coming to save him; there is nothing in the original to
indicate gender.

31. Make (thyself) to swim on courageously and well, as a skilful knowing one of old: truly so! here, indeed, it is now being shown.
32. In the midst of the great ocean; here, indeed, it is being seen.
33. In the midst of the desolate wild,⁵⁶³ far away from man; here, indeed, it is shown.
34. In the ragged first-appearings of daylight,—far off on the horizon; when first seen away there (from the shore); here, such is now being seen.
35. My bird is verily met above; yes! there (it is) now returning; here, indeed, it is shown.
36. Ruatapu stood upright (in the sea) grasping his paddle, his last token! Alas! (it) was bad.
37. “One chief dies (or disappears), another succeeds.” (Old proverb.)
38. Kahutiarangi took Te Panipani to wife; he was a great chief’s son, highly esteemed by Whangara. [34]
39. Here am I, still swimming on; floating, but, alas! going in no certain direction.
40. The big fish is beaten stiff in the tide of quick dashing waves.

563 WC: A term curiously used here,— as it means the uninhabited barren wilderness, far away from the dwellings of man:— figuratively, devoid of help; hopeless.

41. Lo! there it comes! the canoe of Pakia⁵⁶⁴ is fleetly sailing hither.

42. O! big black-and-white sea-gull, flying aloft there; settle down hither on (the) sea from the sky.

43. O! Taane!⁵⁶⁵ enwrap (me), involve (me), with the garment of careless insensibility, that so I may quietly float to the shore.

44. Lie quietly down. O young chief, on the sea, which was purposely becalmed (for thee).

45. Carry safely forward thy brave swimming man to the shore.⁵⁶⁶

This, which follows, is the ending of the powerful and celebrated charm, which enabled Paikea to keep on swimming, and by it make his way through the ocean. In conclusion, he called on his ancestor, on Hikitaiorea; saying:—

46. O Hikita! O! here am I making a great fish of myself.

47. O Hikita! O! Hikitiorea, O! lo! I am making a (drifting) waterlogged white-pine canoe of myself.

48. O Hikita, O! O Hikitaiorea, O! I am making a sperm whale of myself, basking and rolling in the deep.

564 WC: Another of Paikea's ancestors.

565 WC: Taane is now, at last, invoked, to make him just as a tree-trunk, or log of wood, that so he may float unconsciously to the shore; (so, also, verses 22, 51) Taane, is, also, used figuratively, for the Mainland, and is always placed in direct opposition to his enemy the Ocean.

566 WC: Possibly, there is some omission, or portion lost, here.

49. O Hikita, O! O Hikitaiore, O! O Tupara!⁵⁶⁷ seek me hither, carry me to the shore.

50. O Wehengahuki!⁵⁶⁸ fetch me hither, carry me to the shore.

51. Taane! fetch me hither, carry me to the shore, to my own land; on to the very shore there: to my father indeed, on the shore, there away: alas! alas!

Then (he) warmed, cheered, and consoled himself, by remembering the name of another of his ancestors, who was called Mataiahuru, (lit. by, or through, the warm comforting sea or tide,) and so recollecting, he cried

52. Mataiahuru! Mataiahuni! through the warm sea, through the warm water-tide, let my own skin now become warm; (let it now) become as if it were verily basking in the heat of the noon-tide sun suddenly shining on my own skin; let it now be, as if by the blaze of the life brightly kindled up, that it may become hot.

And with (or through) these last words, Paikea caused himself to possess comfortable warm feelings. And so Paikea, at last, reached the shore, at (a place called) Ahuahu. [35]

After some time residing there, he took to wife a woman of that place named Parawhenuamea, who bore him several children; one was named Marumuri, and there were others also named Maru (with some other affix). Afterwards he came further south to Whakatane, where he took another wife, who was named Te Manawatina;

567 WC: Name of one more of his ancestors.

568 WC: Name of another of his ancestors.

whence came the name of Whakatane from Manawatina. Thence he travelled further south to Ohiwa, where he saw Muriwai within a cave; from which circumstance arose the name of Te Whakatohea, who dwelt at Opotiki. In course of time, and still travelling south, he came to Waiapu, where he took another woman named Hutu, to wife; and she came on with him to his own place. She bore him Pouheni, etc., etc.

This highly curious and ancient Maori rhapsody, *the Spell of Paikea*, is among the longest of the kind known to me, and was possibly thrown into its present semi-poetical form (in the original) the better to remember it. Of course it will be understood, that I have prefixed the figures to the several stanzas, or verses, merely for the convenience of reference. Although I have already given copious explanatory notes, a few of its more prominent features may further be briefly noticed.

Throughout it possesses just such words and imagery, as a man (particularly a Maori) in such a situation might be supposed to use and entertain. It seems, to me, very natural that one should speak (talk aloud) to himself in that manner, if only "to keep his courage up"! many of the similes used are very natural and proper.

A kind of regular and progressive sequence almost dramatic runs through it.

There is great freedom from fear, both natural and superstitious; great dependence on himself; and little looking to any higher power for aid (save in one instance) other than to his own ancestors, whose names he repeats and also calls on, but mainly (as it seems) to encourage himself by reflecting on their *meanings*; this

latter is an old peculiar trait in the Maori character, of which I have known many curious instances.

The invocation to Taane (v. 43), is evidently favourably answered by Taane (vv. 44, 45): there is also a second call on Taane (v. 51). It also appears, in other verses, as if some one [36] supernatural power or personage were speaking to him, or for him (vv. 16, 27-29, 31).⁵⁶⁹

It is not said how long Paikea was struggling at sea; but, no doubt, the canoe had put off; according to their custom, in the calm or early morning, (indeed, such is nearly said in the story,) and Paikea, after long battling with the waves, feelingly alludes to the dawn of another day breaking; and to the early morning bird (of hope to him) appearing (vv. 34, 35).

In “the ragged first appearings of daylight,” (v. 34,) is another very peculiar and poetical use of a common term; lit, it is, the ends of the irregular strands of scraped flax yarns (ravelings), hanging from the beginning of the weaving of a dress flax garment; which when finished and new was white and shining.

There are, also, some highly curious coincidences here, agreeing with, several interesting particulars in Homer’s two descriptions of Ulysses and his two long-shipwrecked bouts at sea, each of many days continuance—one in reaching, and one in leaving Ogygia, Calypso’s isle (OD., lib. v. and xii.); though Ulysses was at one time on a raft, and on another, at first, on part of the wreck of his ship, and afterwards for “two days and two nights” swimming. The coincidences are,

569 WC: Appendix Note J.

(1) Ulysses spurting the brine from his nostrils, etc.; (2) his thoughts, words, and modes of encouraging himself; (3) the goddess, Leucothea, appearing to him in the shape of a cormorant, and alighting by him (giving him hope); and (4) Neptune's big billow, purposely sent, smiting Ulysses;—though, here, the “big billow,” rolling on to do so to Paikea, fled before his invoked ancestor. Of Paul, also, we read, of his having been “a night and a day in the deep;” probably floating on part of the wreck of his ship.

I would also offer a few brief remarks on this story of Uenuku's son, Ruatapu.

And first, I would premise, that while the details of a legend are always false, the legend itself always contains a kernel of truth; a mere invention never becomes a legend.

Ruatapu's revenge is terrible; but, as I take it, it was not carried out merely to avenge the great insult he had then received from his father, but to avenge his mother's and her tribe's great wrongs. [37]

If he had succeeded in drowning Paikea also, and then had got safely back to land, which he might have done, in all probability he would have been the head young chief of Uenuku's people; as no one could have told the secret,—that he alone knew. No doubt he was very strong and brave.

His parting allusions to their *home* and people; his belief, and his directions, as to how he should live in their memories and songs; and his remarks on the annual recurrence of Nature's signs on the sandy shore in the summer season, (which he must have often seen there

when a merry boy, and perhaps that very time of the year,!) and of his being also with them *in spirit*, and of their festal meetings, and simple home evening diversions,—are all of an affecting kind. He left a wife (named Te Kiteora) and (at least) one son (named Hau), who are duly mentioned in several genealogical rolls, and from him some of the present East Coast Maoris trace their descent.

In some other old legends which I have heard, Ruatapu is said to have foretold to Pakea, at their parting, of a great approaching flood, which would cover all the low-lying lands of the North Island of New Zealand; and that when its signs should appear, the people were to flee to the mountain, Hikurangi, near the East Cape. But this, in my opinion, is merely a straining and embellishing (after the usual manner) of what Ruatapu had said about his own returning (in spirit) to land from the sea in the summer seasons;—immensely strengthened, also, from his high rank, and tragical end, and from the fact of those sayings having been his *last* parting words, which always had great weight with the Maori people.

“It matters not how long we live, but how.—
 For as the parts of one manhood, while here,
 We live in every age; we think and feel,
 And feed upon the coming and the gone
 As much as on the now time. Man is one,
 And he hath one great heart. It is thus we feel,
 With a gigantic throb athwart the sea,
 Each other’s rights and wrongs. Thus are we men.”

Bailey’s “*Festus*”

APPENDIX.

Note A, page 2.

—“When the knowing priest (tohunga) Ngatoroirangi heard the loud mournful cries and screams of all hands in the canoe—men, women, and children—all wailing at their great disaster and imminent danger, the compassion of his heart was aroused, and rushing up on deck, there that courageous hero stood gazing around at the sky, pacifying the boisterous elements; and having also consoled the frightened people on board of Te Arawa, he proceeded to utter his powerful spell;—this is it:—

“Takina te kawa;
 Ho kawa tuatahi:
 Takina te kawa;
 He kawa tuarua,
 He kawa tuatoru,
 He kawa tuawha,
 He kawa tuarima.
 He kawa tuaono,
 He kawa tuawhitu,
 He kawa tuawaru,
 He kawa tuaiwa,
 He kawa tuangahuru
 Takina te kawa;
 He kawa ma Tangaroa.
 Ka pipi, ka wawai, ka hoaia;
 Ka whanake i raro i ona taranga.
 Tutuki te rangi;
 Eke, eke, eke Tangaroa;
 Eke panuku.

Hui, e! Taiki, e!
 Unuhia te pou;
 Ko te pou mua,
 Ko te pou roto,
 Ko te pou te wharaua.
 He Aturangi mamao.
 Hekeheke iho i runga i o ara,
 Takiki whara,
 Te ara o Ngatoro,
 He ara whano kite po;
 Te po nui, te po roa,
 Te po matire rau,
 Te po whai ariki.
 A ko taku waka ko te Arawa,
 Ngahue i te Parata.
 Eke, eke, eke Tangaroa,
 Eke panuku.
 Hui, e! Taiki, e!
 Tena to tu tau e Rongo ka whawai. [39]
 Te Kawa tuai Nuku,
 Tuai Rangi,
 Tuai Papa,
 Tuai Tane;
 Rua Nuku.
 A tuai,
 A tuai.”

Grey's Mythology and Traditions N. Zealanders, p.
 72: ed. 1854.

Note B, p. 6.

It may here be observed, that the Maori word Ika—their general term for fish, was also formerly used by them to

denote several beings and things of first and greatest consequence and value. *E.g.* —

1. The land in general; the N. Island in particular,—from the ancient story of its having been fished-up from the watery depths of ocean by Maui.
2. Common estate of land.
3. The principal chiefs of a tribe or clan.
4. The mythical and terrible gigantic dragons (Saurians of the olden time, slain by their forefathers: also, their outline representations, made in huge earthworks by way of commemoration. (Trans. N.Z. Inst. vol xi, p. 85, &c.)
5. The Greenstone (*pounamu*); also, Obsidian (*Waiapu, mata*, &c.)
6. Bitumen = *Mimiha* (a favourite and valued old masticatory,) rare and only found thrown up on the sea-shore, and hence said to be the production of a marine animal called *Mimiha: ika*.
7. A band, a troop; a lot, cluster, as of small stars in the sky.
8. A warrior slain in battle.
9. Fig. An active mourner; from such anciently cutting and slashing themselves.

Note: (1) All these, in the ancient Maori cosmogeny, were alike living creatures.

(2) The ancient Maoris not having any large land animal, and being very fond of figurative language and fable, were driven to use metaphorically those of the sea—as

whales, &c., to represent their principal chiefs; and so of the largest and most valued trees of their forests.

(3) Their belief in the Greenstone being a living creature is a highly curious and recondite one, and their ancient legendary stories respecting it are of great interest, and (in my estimation) of importance—It almost seems incredible that such a belief should have been universal among them, yet such was the case.

No doubt, however it might have been anciently originated, it grew afterwards by degrees, owing to the one locality in the South Island where alone it was subsequently found, and thence only obtained through great difficulty and the proper use of potent charms, known only to and uttered by the skilled few! [40]

Hence too, to keep up this mystery, was to increase its high estimation and its price:—Here is a sentence concerning it from an ancient legend:— “Ko te tao i werohia ai te *ika* a Ngahue: a peia ana mai ia, haere tonu mai raua ko tana *ika*, ara ko te pounamu,” &c. &c. = The spear with which the *ika* of Ngahue was transfixed; and then it came to pass, that it was expelled hitherwards, and they two, (Ngahue and his *ika*,) that is to say the *pounamu*, came hither together.

Note C, p. 14.

Here I may briefly mention in a note:—When young I read (devoured!) diligently and repeatedly every work on African travel I could obtain,—from those of Bruce and Mungo Park downwards; these later ones of Major Denham and Captain Clapperton (then fresh) were

causing a kind of stir in the world. All such had a wonderful influence over me, amounting to fascination! I had very nearly early devoted myself to carry on that enquiry—research in Central Africa. What, no doubt, served to increase it was my knowledge of the two Landers; those two young Cornishmen (brothers) were there with Captain Clapperton in Africa; one had died a short time before in the dessert, and it was this additional mournful circumstance that made the only survivor feel doubly lonely, he having so recently buried his brother in the desert sands!—On his return to his native home, Truro in Cornwall, he was well received and cared for.—

Note D, p. 20.

1. The Fable of the Shark and the Large Lizard— (Guana)

In the days of yore the large lizard and the shark lived together in the sea for they were brothers, both being the children of Punga.⁵⁷⁰ The lizard was the elder and the shark the younger. After some time they fell out, and as the quarrel was long and protracted, the lizard, vexed at the conduct of his younger brother, determined to leave off dwelling in the sea, and to reside on the dry land, so he left the water.⁵⁷¹ But just as he got on the shore his

570 WC: According to the Maori mythology (in which each portion, or kingdom, of Nature had a different origin or progenitor), *Punga* was the father, or former, of fishes and reptiles.

571 WC: Darwin, in his “*Naturalist’s Voyage*” (ch. xvii), writing of the large aquatic lizard (*Amblyrhynchus cristatus*), has some curious remarks very applicable here.

brother the shark swam up to where he was on a rock, and wished him to return, saying—“Let you and I go out to sea, to the deep water.” The lizard replied, with a bitter curse, saying—Go thou to the water, that thou mayest become a relish [41] of fish for the basket of cooked roots.⁵⁷² On this the shark retorted with another curse, saying—“Go thou on shore that thou mayest be smothered with the smoke of the fire of green fern.”⁵⁷³ Then the lizard replied, with a laugh, “Indeed I will go on shore, away up to the dry land, where I shall be looked upon as the personification of the demon-god Tu,⁵⁷⁴ with my spines and ridgy crest causing fear and affright, so that all will get out of my way, hurrah!”

572 WC: “Roots” is not in the original, which has merely “kete maoa,”—basket of cooked (food, understood); but the meaning is fernroot, or sweet potatoes. Our common potatoes were not then known to the New Zealander, otherwise I should have preferred that word. “Sweet potatoes” (or kumara) would not answer well, as this food was not in use all the year round; and “vegetables” would mislead, as such were never alone cooked save in times of great scarcity. The allusion is as to the Maori manner of serving-up and setting food before men, each basket having a bit of fish or flesh, as a savour, placed on the top.

573 WC: I had often heard of the old mode of capturing this (the edible) lizard, which lived in holes (burrows) at the foot of trees, and was made to appear by smoking them out; forty years ago this animal was still being eaten by an inland tribe named Rangitane. Mr Nicholas, who came to New Zealand with Rev. S. Marsden on his first visit, has a good story about this lizard in his valuable and interesting book.

574 WC: *Tu* was the name of the New Zealand god of war.

2. The Battle of the Birds.—(A Fable of the Olden Time.)

In ancient clays, two shags met on the seaside. One was a saltwater bird and the other was a fresh-water bird; nevertheless, they were both shags, living alike on fish which they caught in the water, although they differed a little in the colour of their feathers. The river-bird, seeing the sea-bird go into the sea for the purpose of fishing food for itself, did the same. They both dived repeatedly, seeking food for themselves, for they were hungry; indeed, the river-bird dived ten times, and caught nothing. Then the river-bird said to his companion, "If it were but my own home, I could just pop under water and find food directly; there never would be a single diving there without finding food." To which remark his companion simply said, "Just so." Then the river-bird said to the other, "Yes, thy home here in the sea is one without any food." To this insulting observation the sea-bird made no reply. Then the river-bird said to the other, "Come along with me to my home; you and I fly together." On this both birds flew off and kept flying till they got to a river, where they dropped. Both dived, and both rose, having each a fish in its bill; then they dived together ten times, and every time they rose together with a fish in their bills. This done the sea-bird flew away back to its own home. Arriving there it immediately sent heralds in all directions to all the birds of the ocean, to lose no time, but to assemble and [42] kill all the fresh-water birds, and all the birds of the dry land and the forests. The sea-birds hearing this assented, and were soon gathered together for the fray. In the meanwhile, the river-birds and the land and forest-birds were not idle;

they also assembled from all quarters, and were preparing to meet their foes.

Ere long the immense army of the sea-birds appeared, sweeping grandly from one side of the heavens to the other, making such a terrible noise with their wings and cries. On their first appearing, the long-tail flycatcher (*Rhipidura flabellifera*) got into a towering passion, being desirous of spearing the foe, and danced about presenting his spear on all sides, crying “Ti! ti!”⁵⁷⁵ Then the furious charge was made by the sea-birds. In the first rank came, swooping down with their mighty wings, the albatross, the gannet, and the big brown gull (*ngoiro*) with many others closely following; indeed all the birds of the sea. Then they charged at close quarters, and fought bird with bird. How the blood flowed and the feathers flew! The river-birds came on in close phalanx, and dashed bravely right into their foes. They all stood it for a long time, fighting desperately. Such a sight! At last the sea-birds gave way, and fled in confusion. Then it was that the hawk soared down upon them, pursuing and killing; and the fleet sparrow-hawk darted in and our among the fugitives, tearing and ripping; while the owl, who could not fly by day, encouraged by hooting derisively, “Thou art brave! thou art victor!”⁵⁷⁶ and the

575 WC: Its faint little note, uttered as it hops, and twirls, and opens its tail.

576 WC: “Toä koë! Toä koë!” was the owl’s cry, which the words a little resernble.

big parrot screamed, "Remember! remember! Be you ever remembering your thrashing!"⁵⁷⁷

In that great battle, those two birds, the tutu (*Halodroma urinatrix* = petrel), and the taiko⁵⁷⁸ were made prisoners by the [43] river-birds; and hence it is that these two seabirds always lay their eggs and rear their young in the woods among the landbirds. The tutu (petrel) goes to sea, and stays away there for a whole moon (lunar month), and when she is full of oil, for her young in the forests, she returns to feed them, which is once every moon.

From this circumstance arose with our ancestors the old adage, which has come down to us, *He tiitii whangainga*

577 WC: "Kia iro! kia iro koe!" was the cry of the parrot.

578 WC: Of this bird, the *Taiko*, I have formerly often heard, particularly at the northern parts of the North Island, but have never seen one. It is scarcely known here in Hawke's Bay, save by name to a few of the oldest natives. An old chief at Te Wairoa told me that he had known of two which were seen together on the shore of Portland Island (Hawke's Bay), many years ago, one of which was snared and eaten. From another very old chief I had heard of two having been once cooked in a Maori earth-oven as a savoury mass for a travelling party of rank; and from his story it would appear as if the bird could have been easily taken in its habitat, at the will of the lord of the manor; for, on that travelling party arriving at the pa, one of the chief's wives remarked, "Alas! whatever shall I do for a tit-bit to set before our guests?" The chief said, "I'll get you some." He then went out and soon returned with two Taikos, which were cooked and greatly relished. The bird is said to have been large, plump, and fat, and highly prized for food, and only to be obtained on exposed oceanic headlands and inlets. (There are small rocky islets called by its name, Motutaiko.) Possibly it may be a large species of petrel or puffin; although, if the imperfect Maori relation is to be depended on, its beak was more that of an albatross.

tahi;" literally, *A tiitii of one feeding*; meaning, *Even as a tiitii bird gets fat though only fed well once now and then.*⁵⁷⁹

Three things, in particular should be gathered from this Ancient Fable:—1. How very little was sufficient to become the cause of a bloody and exterminating war! (They had many proverbs showing it:—e.g. *He tao kii ekore e taea te karo, he tao rakau ka taea ano te karo:* = A spoken spear cannot be warded off; a wooden shear can easily be warded. Just so, *James* iii, 5, &c.) Hence it was, that joking and punning was never practised by the ancient Maoris; as all such was sure to end in blood! 2. How an insult was quietly put up with, pocketed, for the time only, to be the more fully avenged anon! And, 3. The total omission of the great fossil gigantic bird Moa (*Dinornis* and other genera), which could never have happened, if (as some Whites have been too ready to assume and to say) the Moa was really known to those Maoris as a *living bird*,—

579 WC: This proverb would be used by the New Zealanders on various occasions; such as (1) When chiefs of lower rank would bring a present (annual, perhaps, as of sweet potatoes [kumara] at harvest-time), to their superior chief: (2) When a travelling party arrives at a village, and something particularly good, or extra, which perhaps had been stored up or set by, or just obtained with difficulty or labour, should be given to the party; on such occasions the proverb might be used. Much like (here) our sayings of, "We don't kill a pig every day," "In luck to-day," "Just in time," &c.

Note E, p.22.

THE STORY OF ARION. (*From Ovid.*)

Wha hasna heard of Arion's harp,
How he bare the palm away?
How he garr'd the rinnin' water stan'
For the luve o' his sweet lay?

O gin he sang, the wolf was fain
To let the lamb gae free,
And frae the greedy wolf the lamb
Nae further car'd to flee. [44]

Fu' mony a time the hound and hare
I' the shaw thegither lay,
And neist the lion stude the hind,
And gat nae hurt that day.

The corbie sat by the houlat's nest.
And ne'er a word spak he;
And the turtle-dou sae meik was fain
The goss-hawk's mate to be.

And mony a time, ower hill and dale.
His harp it rang sae clear,
Stude Dian hirsel and thought fu' well
My brither's harp I hear."

Now up and doun through ilka toun
Of meikle fame is he,
Weel kent in ha' and bour through a'
The land o' Sicilie.

But the years they are lang, and the minstrel's fain
To win back to his ain countree.

And he's gathered the gowd his harp has wan,
And Arion sails the sea.

O minstrel wae, what gars ye fear
The winds and the waters wan?
As weel may ye trust the seas, I trow,
As the ship that ye sail on.

For luik where the skipper, the fause fause loun
Has ta'en a sword in hand,
And luik where ready wi' steel and cord
His meinie behind him stand.

What mak' ye, O sailor, wi the sword?
At the helm ye'd better be;
Sic a weapon weel sets a bra' bra' knight,
But it wasna made for thee.

Then up and spak that minstrel bauld,
"A boon, a boon, I pray;
But grant me the grace to touch my harp anes,
Or ye reive my life away."

The skipper he laughed a loud loud laugh,
And he granted him his prayer,
And the minstrel has ta'en a croun o' gowd,
Wadna shame Apollo's hair.

He's row'd him in his robes sae fine,
Like a minstrel of degree,
And aye, as he smote his harp wi skill,
He sang out ower the sea.

O hae ye heard the snaw-white bird
When he kens that he maun die?

Sae sweet sae waefu' sweet the sang,
 Cam fleeting ower the sea.

But syne he's up in his robes sae fine,
 And he's ower the side away,
 For ilka foot the minstrel fell
 The water it loupit twae. [45]

Now list the ferly that befel,
 A doufin watch'd by the keel,
 And has ta'en him up like a gude gude steed
 That kens his rider weel.

He sat fu' firm, and his harp he held,
 And wi' it he's paid his fee,
 For aye as he rade, sae sweet he sang,
 He watched the gurly sea.

Note F, p. 29.

In this dialogue three things are to be noticed: 1 Uenuku's quiet way of giving a gentle hint to his son, which tends to show that hitherto, throughout childhood and youth, no such great distinction had yet been made. 2. Ruatapu ought to have understood his father's meaning; he knew, as well as his father, that he could not possibly use one of his elder brothers' combs, as all were tapu, and each one strictly confined to its owner's own private use. 3. Uenuku's last words were very bitter and galling to the young man, and, no doubt, were spoken openly before all; and as they were spoken in highly figurative language I give them here in the original, with a strictly literal translation and full explanation:— “*E hika, naku tonu koe; he tama meamea koe nahaku; he moenga rau-kawakawa, he moenga hau!*” lit. “O, sir,

thou art indeed my own (son); thou art a son of inferior rank begotten by me; a begetting—or sleeping, or cohabiting,—(among) the leaves and branches of the strong-smelling Kawakawa shrub,—a begetting, etc.—out of doors in the high wind." The strong smell of the kawakawa (*Piper excelsum*) was particularly unpleasant to the New Zealanders; and of course was never taken inside their sleeping houses, like the fragrant smelling grass—Karetu, = *Hierochloe redolens*, used to strew their floors; the whole also meaning, that Uenuku's taking Ruatapu's mother to wife was done without any festivities,—without any gifts of fine-woven mats for bedding—and without a bride's house and other formalities; which usually occupied a long time (a year or two, or more) to get ready.

The mother of Ruatapu was Paimahutanga, the daughter of a very powerful chief named Tawheta, who dwelt not far from Uenuku, who was also his brother-in-law. Uenuku had, many years before, killed Takarita, one of his wives, with his own hands, for adultery committed with two men whom he also slew. On account of this killing of his sister, Tawheta fearfully and maliciously retaliated suddenly, murdering a large number of Uenuku's young people while peacefully and unsuspectingly engaged in harvesting their crop; and also cooked and ate their bodies. In due time Uenuku went to war with Tawheta, to revenge their deaths, and defeated him in a number of pitched battles with great loss; at last killing Tawheta. It had been [46] early planned by Uenuku, that Tawheta's daughter (whose original name was Poumatangatanga,) if captured should become one of his wives; and this was effected at the end of the first

fight, in which Tawheta's fortified town was taken by ambush assault with a prodigious slaughter when her name was changed to Paimahutanga = Good-healing-of-the-wound. Notice, the play upon her former name, in its ending, as to sound; and perhaps the indication of good in her new name, if fighting between them should *now* cease.

This ancient Maori custom,—of the conqueror taking the daughter of the principal chief conquered in battle to wife, (i.e. as one of his lesser wives or concubines,) was also almost world-wide. The classical scholar will remember the bitter wailings and tragic sayings of the great Trojan dames, Hecuba, Polyxena, and others, on Troy being taken by the Greeks and they being carried off captives, at the prospect before them.—

Note G, p. 32.

It was (and is) a common custom among the Maoris for a great chief always to speak of himself in a very lowering manner. A notable instance of this is recorded in the history of Uenuku; who when engaged as a priest in roasting the tabooed heart of Takarita (one of his wives whom he had killed), utters his invocation, or spell, to the supernatural powers, and says of himself—

“Never shall the first-borns (of chiefs) be forgotten by me,—
 (An) eater of scraps and leavings!
 The cooking-oven is baking slowly;
 (Here I am) roasting away, naked, waiting.” &c.—

All indicative of the position, work, and attitude of a slave.

One of the finest instances of such sayings known to me, is that of the hero-chief Whakatau in his spell, or invocation, on his going forth to fight; which is also a choice specimen of Maori Ideality—Mind and Poetry. Thus the story goes

—“Then the brave warrior Whakatau, arose, and seized his fighting-belt, and while girding it on, uttered the following charm, that he and his companions in arms might become bold in battle.”—

If Tangaroa⁵⁸⁰ should enquire,—
 “Who is that young warrior
 So daringly girding on *my* warbelt?”⁵⁸¹
 (I reply) Nobody at all; nothing, only me,
 Whakatau!— [47]
 A man of no rank,
 A man of no notice,
 A demon, a despised thing,
 A poor young fellow, (an) eater of servants’ scraps.
 But,—concerning my war-belt, ha!
 My war-belt which was dreaded.” &c., &c.

(Trans. N.Z. Inst., vol. xiii, p. 67.)

Note H, p. 32.

“Space” (or the clear open expanses, or Air,) and “Sky,” are here invoked, as being the most ancient of all their many personifications, and commonly called on, in their

580 WC: Tangaroa the great god of the sea and of fishes, their Neptune:—this expedition was going by sea to fight.

581 WC: The war-belt was woven very elaborately, with fitting ceremonies &c., &c., and was fixed on very securely much after the manner of a T bandage.

spells, &c.—as in Whakatau's charm (above), where he goes on to say

—“My foes are already hiding through fear!
Enclose me around, O Space!
O Space and Air encircle me!
Sky encircle me!” &c.—

And so, in the opening of the ceremonial charm used by the priest for Divorce: he says:—

“A pulling-off by Space
A pulling-out by Sky
A great drawing-out from within;
A letting fall,
By this great priest.” &c.—

(*loc. cit.*, p. 69.)

And, it should ever be borne in mind, in reading of or considering the ancient Maori cosmogony, that the Sky (*Rangi*) was their Beginning, their great Progenitor, their Father; the Earth (*Papa*) his Wife being also their Mother.

Note I, p. 32.

These two verses (7 and 8) require explanation. Here there are six high reasons given by Paikea for asserting his nobility: —

- (1) “Son of a chief”—*i.e.*, by *both* parents.
- (2) “Properly begotten”—*i.e.*, with betrothal, and parental consent, and every proper preliminary arrangement. All this was wanting in the case of Paimahutanga, the mother of Ruatapu; (see Note F.)

- (3) "Son above"—*i.e.*, in and with the approval of the Sky.
- (4) "Son abroad"—*i.e.*, around—in or with the approval of Space
- (5) "Son according to ceremonies duly performed"—*i.e.*, by the priests (*tohunga*), at the early naming,—the cutting of hair,—the arriving at puberty, etc.
- (6) "Son according to the celestial signs"—*i.e.*, these, such as are here referred to, were,—distant summer lightnings,—*aurora australis*,—peculiar red and other clouds, appearing on the horizon,—shooting stars, etc., etc.; and were always supposed and believed to have been given at, or shortly after, such ceremonial seasons, as tokens of approval, etc. [48]

Note J, page 36.

The old Maoris even professed to have heard songs, of a highly curious character, sung by the spirits of the dead! and by fancied atuas, (supernatural beings,) while engaged in deep-seafishing far out at sea. These latter they responded to and sang their replies. I have seen some of those so-called supernatural songs, also their extemporaneous replies, and have been struck with the shrewdness and fitness of these latter. There is a singularity here which has frequently reminded me of what is recorded of the Greenlanders; who, however, did not meet their supernatural visitants so bravely as the Maoris. It is said, by Hans Egede, (the earliest missionary among them)—when writing of the long winter, during two months (November to middle of January) in which

the sun is not to be seen.—“This long night was often made more painful by fancied terrors: sad sounds were often abroad in the air, caused by the meeting of masses of disjointed ice or the splitting of the rocks with the intense cold: even the piteous cry of the seal was sometimes enough to create alarm: there were noises also on the deep and the shore, for which they could not account; so that they were often like the people in Egypt, during the plague of darkness, when, in the sublime description of the Apocrypha—“they heard the sound of fearful things rushing by, even by their doors and in their chambers, but saw not the form thereof.” And again,—“Of spectres the Greenlanders stand greatly in dread. The loneliness of their lives with the long darkness, where the sense of hearing is so often invaded with the most appalling sounds, conduces to this belief. The accidents also, by which so many lives are lost in storms, and in fishing, affect their imaginations. The spirits of the lost at sea are heard to come on shore in the dead of night and utter a mournful wailing. The great sea-spectre in which they believe, is of a more fearful character. This spectre appears before any misfortune, as shipwrecks or storms, and is seen sometimes on a solitary field of ice,—at other times it flits rapidly over the frozen plain, and its frightful shrieks can be heard to a great distance; it has even been heard to utter words—but only of inevitable misfortune being at hand to the hearers.”—Carne’s *Lives of Eminent Missionaries*, vol. i.



**1889 A few brief historical notes and remarks
concerning the early Christian Church at
Ahuriri (Napier): in a letter to the editor of the
“Daily Telegraph”.**

Daily Telegraph Office, Napier. 14 p.⁵⁸²

THE CHURCH IN THE EARLY DAYS OF AHURIRI

A few remarks on a portion of a very curious letter,
written to the Editor of the “DAILY TELEGRAPH”
Napier, from “St. Paul’s Parsonage, Murrurundi,
N.S.W.,” by “the Incumbent the Rev. W. Marshall.”

“Quoniam quidem multi sunt ordinare narrationem
rerum: visum est et mihi, assecuto omnia a principio
diligenter, ex ordine tibi scribere”⁵⁸³

LUCAM I.

—“I pray you in your letters,
When you shall these unlucky deeds relate,
Speak of me as I am; nothing extenuate,
Nor set down aught in malice.” —

SHAKESP., *Othello*.

582 This material was first published as two letters to the editor on
29 and 30 March 1889.

583 Inasmuch as many have undertaken to compile a narrative of the
things which we have accomplished among us, just as they were
delivered to us by those who from the beginning were
eyewitnesses and ministers of the word, it seemed good to me also,
having followed all things closely for some time past, to write an
orderly account for you. (St Luke, Ch.1).

SIR,—My attention has been repeatedly drawn to a peculiar letter from the Rev. W. Marshall to you, of January 5th, and published by you in your paper of the 19th of that month. I should have publicly noticed it before. only my two months summer absence in the woods (at Christmas and the New Year), and subsequent illness on my return to Napier prevented me. It is rather late now, I allow, to remark upon it; but I feel constrained to do so for several reasons,—some of which may, perhaps, be rightly inferred from this letter to you,—my chief one, however, being to leave a true historical record of a few significant and important matters which happened here at Napier (then Ahuriri), during the early time mentioned by Mr. Marshall—and for many years before. I being the resident here and fully acquainted with them all. Moreover I may also say, that I feel the more inclined to do this from both the manner and the words of Mr. Marshall's letter; in which, at the opening he says:—

“In alluding to the work of the church in the early days of Napier, and the part I was privileged to take in initiating her services, an omission was made, which might mislead some, and which for the sake of accuracy, I think it may be as well for me to supply.” Now I purpose to follow Mr. Marshall's leading, and do what he has overlooked, forgotten or omitted, I hope to supply; and all from original documentary sources.

My letter must, therefore, necessarily be a long one, but I hope it may prove both interesting now and useful hereafter.

Mr. Marshall goes on to say:—(1) “In the year 1852 I arrived in Napier (then called Ahuriri) from Wellington: (2) at that time there was no house—only Mr. Alexander’s store: (3) no sound was heard except the cry of the sea-gull, and the song of the Maori as he paddled his canoe: (4) Two months after my arrival in Ahuriri Bishop Selwyn paid the district a visit,—and he appointed me lay-reader: (5) I held my first service in the *raupo* (rush) building in Domett’s gully, where public prayer was offered up on the island for the first time. (6) Afterwards I conducted service in the school-room (afterwards burnt down), which then occupied the site whereon stands Newton’s store.”

In the autumn of 1852, Bishop Selwyn paid his usual Episcopal visit to the district; he came overland from Wellington on foot, and stayed several days at my house at Waitangi; where some hundreds of Christian Maoris from neighbouring villages in Hawke’s Bay had assembled to meet him.⁵⁸⁴ On his leaving for the North I travelled with him (both of us on foot) to the River Waikari, where the Rev. J. Hamlin from Wairoa met him.

584 WC: As I am writing chiefly on Church matters, it may not be considered amiss for me to mention, in a note, that on this occasion the Bishop confirmed 229 adult Maoris at the Mission Station, and 19 aged persons at Tangoio on our way North; and these, with many others, were subsequently Communicants: (besides several whom he had also Confirmed at the various large Maori villages on his way North from Wellington.) On a former Episcopal visit he had also Confirmed 136 adults at this Mission Station, and 104 on his journey through the district under my charge. All had been gathered from Heathenism in these parts during the previous 7–8 years! It was a memorable time, and the Bishop was highly pleased.

Mr. Marshall never saw the Bishop during that visit; which, of course, was his only one for that year.

Moreover I find, from a letter, that Mr. Marshall was residing at Wellington in October, 1852.

Again, in the autumn of the following year, 1853, (on March 30th,) Bishop Selwyn was again here in Hawke's Bay. On that occasion there was a large party of English gentlemen travelling with him (all mounted), including the Governor Sir. G. Grey, Mr. Tollemache, Mr. Valentine Smith, and the Rev. (now Archdeacon) S. Williams. The party had stopped at Hapuku's *pa* (village) near Pakowhai the preceeding night and part of that day; and late in the evening they halted at Renata's *pa* Te Pokonao, on the banks of the River Ngaruroro; whence on the next morning (March 31st) they proceeded towards Petane and the North; and probably on that occasion Mr. Marshall and others saw Bishop Selwyn at Ahuriri, in his passing through, though the travelling party made no stay there.

Here I should state that my large dwelling-house at Waitangi had unfortunately been burnt down with all its contents on the 8th January 1853.⁵⁸⁵ At that time of their

585 WC: It may be worthy of a short Note to remark, that this very day (January 8th) was the one on which all the Maoris round about were gathered together at Ahuriri (including my own male domestics), to receive the stipulated payment for Scinde Island (now Napier); hence, too, it was that I was well-nigh left alone at the Mission Station at Waitangi, when, at noon, the fire took place; the wind, at the time, was one of those strong Westerly hurricanes, so that nothing could be saved! The conflagration was soon seen and known by them and the Europeans at Napier,—who climbed

visit I was obliged to reside in my small unlined weatherboarded store in the adjoining field, without fire, etc.,—although it was very cold and wet, for the whole flat country had been recently deeply flooded, and was then very deep in mud and water! insomuch that the party of visitors had some difficulty in getting their horses through the mire on to the outer beach, in the absence of roads.

I may, also, observe, that I never before heard of Bishop Selwyn having appointed Mr. Marshall as lay-reader at Ahuriri; though, as Mr. Marshall says so, I do not doubt it; but he could only have filled that office for a very short time—a few weeks at most;—for it was during the same autumn, and in about a month or so after the Bishop had passed on, that Mr. Marshall himself with Mrs. Marshall and two pupils, also left Ahuriri for Mr. Guthrie's station at Castle Point, where he remained for three (or more) years as tutor to Mr. Guthrie's rising family. I have particularly good reasons for remembering this (my first acquaintance with Mr. Marshall) as Mr. Marshall with his travelling party on foot brought-up unexpectedly at “my small and cramped weather-boarded store” on the first evening and night on their journey from Ahuriri.

Some years after this, on Mr. Marshall's return from Castle Point (I believe in the year 1857), he resided at Clive; where during another very severe flood, both he and Mrs. Marshall narrowly escaped drowning, being

to the top of the hill, from the house in Domett's Gully—to lament over it.

saved with some difficulty from the roof of their school-house in a boat!

In due course, however, Mr. Marshall came back to Ahuriri, (then rising Napier! with its shops, hotels, public offices, magistrates, &c., &c.,)—by then the transformation had taken place and Napier was firmly established. And it is worthy of notice that it was during those very years of Mr. Marshall's long absence (after his first brief residence) that the large influx of early respectable settlers took place; men determined to stay, and to brave the many discomforts inseparable on first settling and colonizing; men who have mainly constituted the "backbone" of Napier, and of the District;—who have been the true cause of the "unearned increment" (falsely assumed by the Government). These remained, and they, or their descendants, are here to this day.

In Napier, Mr. Marshall dwelt for some time, but not very long, as he again, at the end of the year 1858, removed far off to Pohui, 27 miles W. on the hills, to a sheep run he had there. It was, I suppose, during this second short residence in Napier, that he "conducted service in the School-room"; but certainly not down to the time of its being burnt, nor for a considerable time before that event, as that duty was for a long time performed by the late Capt. Newman until the arrival of the Rev. Peter Barclay, the first resident Scotch Presbyterian Minister in Napier and Hawke's Bay, who, from his arrival held Divine Service regularly in that School-room.

At Pohui Mr. Marshall remained for a few years; ultimately returning to Napier; where he conducted a

very respectable Boys' Day and Boarding School for several years the benefits of which to the then rising generation are still remembered.

Two other matters, prominently related by Mr. Marshall, I have yet to notice:—

1.—The romantic or dreary solitude of Ahuriri! He says, that “in 1852,” (or, it may have been early in 1853,) “there was no house where Napier now stands, only Mr. Alexander’s store in Onepoto; and no sound was heard save the cry of the sea-gull, and the song of the Maori as he paddled his canoe,” and yet Mr. Marshall could seek the office of Lay-reader in the Church to such a congregation! and find a large and suitable house ready to hand “in Domett’s Gully” (of which, more anon) in which to hold his first service.

Here, I think, it might be very properly enquired,—In what capacity did Mr. Marshall come to such a solitary out-of-the-way place as Ahuriri? What for? What to do? After residing for some time in Wellington—where he broke up house-keeping to come to Ahuriri. I believe, that he came to Ahuriri to carry on his occupation of Teacher or School-master; and surely he must have made fitting enquiries before he left Wellington.

At that very time (so pathetically deplored by Mr. Marshall) and *before*, I suppose there were at least 50 whites residing at Port Ahuriri; some with their wives and large families, who, or their descendants, still remain settlers here:—As, for instance, Messrs W. Villers, and James McKain, who had arrived at Ahuriri 2 or 3 years before (in 1850). In fact, (and as a significant proof of how early and quickly the white population of Ahuriri

was increasing,) I may mention,—that early in May 1852, (at least 6–7 months before Mr. Marshall's arrival,) Mrs. Villers had applied to me as the Resident Minister to marry a young servant-girl of hers to a young carpenter of the Port; and it was their (united) wish the marriage should take place there. But I was obliged to inform Mrs. Villers in reply, that as I was bound by the laws of the Church of England and by the instructions of Bishop Selwyn, I could only marry them during canonical hours in one of the neighbouring churches, viz. at the Mission Station (Te Awapuni) Waitangi; or at Petane; and the young couple were married by me at Petane (their choice), their Banns having been previously called at the Mission Station Church. Moreover Mr. (afterwards Sir) Donald McLean, as Government Land Purchaser, with his party were also at Ahuriri residing in the summer of 1851, (to which place Mr. McLean removed after his first 3 days spent with me in my house at Waitangi). On his first purchase of land from the Maori chiefs in that same year, a number of Surveyors were immediately required with their assistants; among those early professional men were Mr. Park, Mr. Pelichet, and many others (now no more!)—and all long before Mr. Marshall's arrival. And the little port had even then, and for some years previous, become quite a bustling place of trade,—with small vessels constantly coming and going both N. and S.,—the Maori trade, in wheat, maize, potatoes, pigs, and dressed flax, was very large, all of them then were industrious raisers of crops for sale and export, and hard workers too! such, indeed, was the concourse at times at the Port, that three hotels were very speedily established there; in which it was

often difficult to get a meal or a bed. Early in 1853 the late Mr. Fitzgerald (then Chief Provincial Surveyor of the Province of Wellington) with his wife and family, also his sister and her husband Mr. Tyser and their family, Mr. Bousfield, wife and family, Mr. W. Burton, wife and family, and many others (all forming one party), also arrived. And as this large party arrived in the early autumn, I believe they were actually here before Mr. Marshall left for Castle Point. In fact, "the *raupo* building in Dommett's Gully," which Mr. Marshall mentions, was a very handsome and strongly built Maori house, specially erected by the combined Maori chiefs as a fit residence for Mr. Mclean, and made (at his request) after the English plan and fashion of my own detached study at Waitangi, which he had so greatly admired. It is also worthy of note, that early in January 1853 (I think, on the 11th, and therefore during that short time that Mr. Marshall was first residing at Ahuriri), Mr. McLean held the Magistrate's *first* Court in this same building, which was largely attended by both whites and Maoris,—the place being literally crammed, (I, myself, was present on that occasion.) And in this same building, the Hon. Mr. Domett, C.M.G., our first Land Commissioner and Resident Magistrate, (to whom Napier is so largely indebted,) who came here early in 1854, resided with his wife and family several years, during Mr. Marshall's long absence at Castle Point; when it, also, served the Government as our first Crown Lands Office, in which nearly all Napier was sold! and, afterwards, for many years, it was the residence of our second Resident Magistrate, Capt. Curling; and after him of Major Scully, so long our Inspector of Police.

2. That “he, Mr. Marshall, in 1853, was the first to offer up public prayer on the island in the English language”!! and this after, at least, 10 years of pretty frequent visits and sojournings made there by the Bishop, the Archdeacon, and several other non-resident visiting English Protestant Clergymen; besides those common clerical ones of the late Father Reignier and other R.C. priests who had preceded him; not to mention my own many times of meeting and teaching and of Divine Service during those 10 years as the resident minister of Ahuriri, in the 3 Maori villages formerly situated at the Port including Scinde Island,—as well as, occasionally, to the English sick and others of the shipping and on shore.

Had Mr. Marshall remained at Ahuriri, I should not (in all probability) have had to come hither from Waitangi (on two special occasions) to bury the dead in the Church-of-England cemetery; the *first* one interred therein being the daughter of Mr. Wm. Villers, Senr., in 1854; another, some years after, the child of Mr. F. Hamlin.

In thus briefly narrating the foregoing, (and merely condensed from documentary sources,) I have been scrupulously particular to be truthfully exact; for I confess, I fail now to see (as formerly to know) the especial prominent “part” that Mr. Marshall says “*he was privileged to take in initiating the services of the Church in the early days in Napier.*” When—long before Mr. Marshall’s name was ever heard of at Ahuriri or in Hawke’s Bay—the Bishop of the Diocese had confirmed more than 500 adults, and with the Archdeacon (afterwards the first Bishop of Waiapu) had often

administered the Holy Communion to about 600 male and female communicants!! I say nothing respecting my own labours in bringing forward and in building-up the Church (also ignored by Mr. Marshall) during my 10 years of residence and active service:—and that “not in another man’s line of things made ready to our hand.”

In conclusion: I will further say, that I much wish the Rev. W. Marshall had written *less*, and also written *more*: *less*, about himself and his doings: *more*, so as to show clearly those great breaks (or “leaps and bounds”) absolutely required to discern truly those years and long intervening periods of time so closely strung together by him in his letter. No doubt, to some, who do not know Mr. Marshall, that mode of writing may appear both as *suppressio veri* and *suggestio falsi*; but I would rather charitably set it down to the well-known and proverbial “old man’s want of memory” (especially when invalidated), coupled with a desire to shorten his letter written to a foreign paper so far away. Others, again, may be inclined to ask, “Why have written his letter at all?” To such enquiries I cannot give an answer.

If any old resident in Hawke’s Bay, having a perfect knowledge of the past, (A.D., 1850–1858,) can correct, or add to, my narration, I will thank him to do so. I purpose sending a copy of this letter to the Rev. W. Marshall, in N.S.W.

I am, &c.,

WILLIAM COLENSO

The Ordained Church-of-England Minister to Port Ahuriri.

P.S.—Of course, it will be plain to the reader, that I have merely and briefly brought forward circumstances in connection with Mr. Marshall's letter. There are many others, more or less historical, and much more strange and interesting, that I could narrate, which took place during my first ten years of residence; to these I may return at an early date.—W.C.

Napier, March 26th, 1889.

THE REV. W. MARSHALL.

[TO THE EDITOR.

SIR,—In a copy of the DAILY TELEGRAPH which was sent to me I read an account of the consecration of St. John's Cathedral. In alluding to the work of the church in the early days in Napier, and the part I was privileged to take in initiating her services, an omission was made, which might mislead some, and which, for the sake of accuracy, I think it may be as well for me to supply. In giving a sketch of the early history of the Church of England in Napier, the writer of the article in question, says:— “Some thirty years ago Mr. Wm. Marshall used to hold services on the site which is now occupied by Newton's store. Mr. Marshall afterwards became an Anglican clergyman, and after his ordination removed to Queensland, where he is now settled. The services by Mr. Marshall were greatly appreciated by the small community.” Now, the fact is, after my ordination, I was appointed to the Cure of Havelock, where I remained, for over five years.

Perhaps it may not be uninteresting to some if I gave a short sketch of my career in Napier—that is, as far as the Church of England is concerned. In the year 1862, I arrived in Napier (then called Ahuriri) from Wellington. At that time there was no house where Napier now stands. There was only Mr. Alexander's store (afterwards Mr. Newton's) in Onepoto, and no sound was heard save the cry of the seagull, and the song of the Maori as he paddled his canoe. Truly, “a little one has became a thousand, and a small one a strong nation.” Two months after my arrival in Ahuriri, Bishop Selwyn paid the district a visit, and at a meeting which was held in Onepoto, he appomted me lay reader, and I held my first service in the raupo building in Domett's Gully, where public prayer was offered up on the island in the English language for the first time, Mr. Tanner, Mr. Newton, and about half-a-dozen others being present. Afterwards I conducted service in the schoolroom (afterwards burnt down), which then occupied the site whereon now stands Newton's store. In the year 1872, I was ordained by the late Bishop of Waiapu, and appointed to the Cure of Havelock, which then included Clive and Hastings. During the five years I lived in Havelock, I managed, with the aid of warm-hearted and loyal members of our church—how warm-hearted and loyal I remember with gratitude to this day—to get the three churches St. Luke's, St. Mark's, and St. Matthew's built. My health failing, I was advised to try the drier climate of Australia. In 1878 I left Napier and went to Townsville, in North Queensland, for a short time. Whilst there the late Bishop Tyrrell offered me the incumbency of Murrurundi, in

New South Wales, which I accepted, and where I still am.

Apologising for the length of this letter,
I am, &c.,
William Marshall.

St. Paul's Parsonage,
Murrurundi, N.S.W.,
January 5th, 1889.

Printed at the "Daily Telegraph" Office, Napier.

1889 A Description of Two Newly-discovered Indigenous Cryptogamic Plants.

Transactions of the New Zealand Institute 22: 449-452.

[Read before the Hawke's Bay Philosophical Institute,
8th July, 1889.]

Isoëtes, Linn.

1. *I. multangularis*,⁵⁸⁶ sp. nov.

Root a tuber as big as a small marble, orbicular in outline, sub-conical, 8-9 lines long, 6-7 lines diameter, multangular; deeply furrowed, covered with a dense coating of fine dark-brown hairs; a cross-section shows 5-6 broadly-obovate and nearly regular pure-white knobs

586 *Isoetes kirkii* A. Braun.

(or lobes), their sinuses each 2–3 lines deep, with a minute central pith-like ring (*primá facie* reminding of a small primrose corolla). Rootlets many; very long—3 in.—5 in., filiform, mostly simple, brown. Leaves numerous, 15–20 and upwards, 6 in.—7 in. long, erect, linear, very acuminate, sub-rigid, brittle, glabrous, glossy, minutely and clearly marked in quadrilateral divisions, the upper portion light-green, the lower white, semi-terete on the under and slightly flattened on the upper surface, regularly septate in 4 alternate longitudinal divisions as if composed of 4 rows, tips terete filiform, apex obtuse, breadth at middle $\frac{1}{15}$ in., the lower portion for 1 in.— $1\frac{1}{2}$ in. canaliculate with the margins membranous and gradually conniving, decreasing upwards, the basal portion for about 1 in. dilated to nearly 3 lines in breadth. Below the leaves on the outside are broadly elliptic light-brown transparent scales with a thickened dark centre and very finely reticulated, their margins irregularly lacerate and tip apiculate. Sporangium ovoid, sides straight, sub 2 lines long and 1 line wide. Macrospores of various shapes, some hemispherical, others globoso-tetrahedric like segments of spheres, usually smooth, a few only having 2 or 3 minute points; and also varying in size from $\frac{1}{50}$ in. to $\frac{1}{80}$ in. diameter Microspores very minute, globular and sub-elliptic, hyaline, $\frac{1}{8000}$ in.— $\frac{1}{2000}$ in. diameter. [450]

To this I append with very great pleasure the interesting and valuable detailed microscopical examination of the sporangia and their contents kindly and purposely made for me by my friend Dr. Spencer, with the aid of his powerful microscope; who thus writes: "I have had another hour with the pretty little *Isoëtes*. 1st. The

sporangium at the base of the leaf is an ovoid body, slightly flattened at the sides, $\frac{1}{8}$ in. long by $\frac{1}{12}$ in. broad; in some cases with a Y-mark at the end as though this were the shape of the opening when ripe. Within this are the macrospores. Out of one of the sporangia, which I divided, I counted twenty of these bodies. They vary in size from $\frac{1}{50}$ in. to $\frac{1}{70}$ in. in diameter; a few are even smaller than this. They are not uniform in shape, but for the most part give the idea of being segments of spheres; some are hemispherical, others, and by far the larger number, have the appearance of hemispheres either divided into four parts or their inner sides flattened by mutual compression into a solid triangle with one face forming a segment of a sphere. You may get an idea of the shape by dividing an apple or potato into halves, then laying one half on its flat face, dividing it again into four by a crucial incision. Each of these bodies is composed of three tunics; the outer semi-transparent, membranous, brownish in colour, showing ridges and furrows, which seem to result from pressure on the middle coat. The middle coat is white, thick and ridged along the margins, with the facet sculptured into figures of various shapes. Under the microscope the effect is very beautiful, and the original must be seen to appreciate it. The innermost coat is also white, but smooth. Within it are the microspores, minute spherical or ovoid bodies $\frac{1}{8000}$ in.— $\frac{1}{2000}$ in. in diameter, pellucid, having much the appearance of starch-grains or oil-globules. I put on the polariscope, but they did not respond, and therefore are not the former; and I washed them with ether, but they did not disappear, and therefore they are not the latter. The effect of the latter operation was to make the contour much more

distinct, and also to relieve it of a brownish coloration, so that I am disposed to think they must have been surrounded by or contained some oily matter. They are very numerous."

Hab. "In sheltered bays, Lake Taupo, in 2 ft.–10 ft. water with sandy bottom." *Mr. C. J. Norton*, June, 1889.

Obs. I. The examination, &c., of this little plant has occupied no small amount of both time and labour, with also the scattered necessary references; partly, however, owing to the fact of the lot I had received from Mr. Norton arriving in a much damaged state, being mostly beached specimens of plants torn up and cast on shore in a furious gale. It was pretty apparent, notwithstanding, that they differed from our other (described) New Zealand species, as also, on fuller [451] examination, from known foreign ones, which will be found from the description.

II. This species differs from *I. lacustris*, Linn., of the British lakes (probably also cosmopolitan), in its peculiarly-formed thick tuberous root with its hyaline scales, its longer and narrower and differently-constructed leaves, and more slender sporangia. In its tuberous root it slightly resembles *I. duriæi*, Bory (a French species, but lately found also in the Island of Guernsey), and also *I. hystrix*, Durieu (an Algerian species), but it is a much larger plant than either, with very different leaves, &c., and its root also wants the peculiar rigid, trifid, and pungent scales of *I. duriæi*, and the long, black incurved spines of *I. hystrix*.

III. Preserving some of their roots, I cleaned and placed them in a clear glass vase, covering them with water.

They soon sprouted fresh leaves, and have grown nicely, with many young plants as fine as hairs springing from their sporangia.

Order VIII. FUNGI.

Genus 27.⁵⁸⁷ Geaster, Micheli.

1. *G. coriaceus*,⁵⁸⁸ sp. nov.

Outer peridium 4½ in. diameter, expanded, broadly hemispherical at base, very thick—sub 2 lines or more, leathery, tough, firm and rigid when dry, divided about half-way down into 5 pretty equal broadly-triangular acute spreading segments, their tips very distant, each 1 in. wide at base, much recurved and deeply transversely fissured creased and wrinkled above at base, their fissures, &c., of a pale colour, dark blackish-brown rough and much reticulated on the outside, smooth and somewhat shiny and light-brown on the inside, with a continuous thick border at their inner bases raised all round much above the inner peridium, the large hemispherical sac or cup being 1¾ in. diameter, and fully ¾ in. deep; *inner peridium* 1¼ in. diameter, globular, thin, papery, somewhat smooth but not shiny (under a lens very slightly but evenly roughish, as if finely felted), sessile, the junction being small, very free all round, dark-brown, having a depressed coronula 4 lines diameter, with its centre raised and of a lighter brown, the ostiole large—1½ lines diameter, gaping, margins irregular, incurved, thickly silky and sub-ciliate. Spores

587 WC: The number of this genus in Hooker's "Handbook N.Z. Flora."

588 *Geastrum triplex* Jungh.

very minute, spherical, “ $\frac{1}{6000}$ in. diameter, studded with minute processes; under the microscope are numerous puncta, evidently the places where the processes are attached on the flattened surface” (Dr. Spencer, *in lit.*).

Hab. On the ground at Tangoio, near Napier; 1889: *Mr. A. Hamilton.* [452]

Obs. A fine species, having some slight affinity with our other described indigenous ones (most so, perhaps, with *G. coronatus*, Col., “Trans. N.Z. Inst.,” vol. xvi., p. 362); also with those of Tasmania and Australia; but it is very distinct from them all. I have received several specimens, and they generally agree in size, form, cuttings, and markings. This is by far the largest indigenous species known to me in a *perfect* state; but I have found at various times, in travelling, deposited on both river-mouth- and sea-beaches, the detached outer peridium of a much larger and coarser species, but could never meet with a perfect specimen.

**1889 A Description of some Newly-discovered
Indigenous Cryptogamic Plants.**

Transactions of the New Zealand Institute 22: 452-
458.

[Read before the Hawke's Bay Philosophical Institute,
7th October, 1889.]

CLASS III. CRYPTOGAMIA.

Order I. FILICES.

Genus 18.⁵⁸⁹ *Asplenium*, Linn.

1. *A. ornatum*,⁵⁹⁰ sp. nov.

Plant tufted; caudex short sub 1 in. high, very scaly; scales black, 4-5 lines long, subulate, very acuminate, tips flexuous, with a few minute scattered weak subciliate-like lateral lobes, cancellate, sub 20 cells wide at base; cells parallelogrammic, irregular, their walls very thick and coarse; few-fronded (4-6), sub-erect, membranaceous, flaccid, drooping, dark-green, 11 in.-13 in. high, thickly scaly throughout on stipe, rhachises, and petioles with blackish veined scales, similar to basal ones but much smaller. Stipe very slender, 4 in.-5 in. long, about $\frac{1}{10}$ in. wide, dryish, striate, deeply sulcate, pale greyish-green. Frond 6 in.-8 in. long, oblong-lanceolate (sometimes broadly ovate), sub-tri-pinnate, glabrous; pinnæ alternate, distant on main rhachis 1 in. apart, 4 in.

589 WC: The numbers in this paper attached to both orders and genera are those of "The Handbook of the New Zealand Flora."

590 Possibly *Asplenium hookerianum* Colenso.

long; pinnules very distant on secondary rhachises sub $\frac{1}{2}$ in. apart, with long capillary petiolules 3–4 lines long, usually oblong-lanceolate, 4–5 lines long, with narrow thickened white margins, the upper half sharply toothed sub-laciniate and narrow-lobed, sometimes cut into 3 segments with their tips sharply toothed-laciniate, the middle segment narrow rhombic-cuneate, the two outer ones linear and petiolulate; veins few, narrow, sub-flabelliform, simple rarely once-forked, thickened [453] (lanceolate shape) at apices, and there very prominent on the upper surface, not extending to margin. Involucre very membranous, intramarginal, 2 (sometimes 3) on the larger segments, only 1 on the smaller ones, narrow-linear sub 2 lines long, ends sub-acute. Sori light reddish-brown, largely appearing.

Hab. On dry hilly ground at Kuripapango, County of Hawke's Bay; 1889: *Mr. Pinckney.*

Obs. It is not without some hesitation, and only after a long and protracted examination, that I advance this fern as a *sp. nov.*, for certainly it is pretty closely allied to *A. hookerianum*, mihi (var. *adiantoides*, Raoul); but it differs from that fern in several characters, which, moreover, are constant in all the specimens I have seen. *A. hookerianum* in all its forms (whether the larger var. figured by Raoul, "Choix de Plantes de la Nouvelle-Zélande," pl. i.—or the smaller ones figured by Hooker, "Icones Plantarum," vol. x., tab. 983) has very broad segments, thus described by Raoul: "flabellatorotundatis crenatis" (*l.c.*); by J.D. Hooker, "rhombeo-sub-rotund," "Handbook N.Z. Flora," p. 373; and by Baker, "rounded and crenate," "Synopsis Filicum," p. 213,—who also

says, "the pinnæ and pinnules in shape resemble those of *Asplenium ruta-muraria*," which characters, however, are not in this plant. The narrow sharply-toothed segments of this fern are also margined white with peculiar apical terminations to their veins, which are also very conspicuous and more simple; the large basal scales are without the clear intramarginal continuous line so striking in *A. hookerianum*, and are irregularly and coarsely cancellate; while the very long capillary and distant petiolules, together with their narrow segments, give this fern a light, airy, and graceful appearance, which is also very attractive.

2. *A. gracillimum*,⁵⁹¹ sp. nov.

Plant tufted; caudex short, composed of coalescent stipites, very scaly; scales membranaceous, softish, shining, subulate, $\frac{1}{2}$ in. long, 2 lines broad at base, cells there sub 40 wide, more sub-ciliate with smaller and narrower cells than in *A. ornatum* (*supra*). Fronds 8–10, erect, drooping, 12 in.–14 in. high, membranous, soft, flaccid, glabrous, darkish-green. Stipe 4 in.–5 in. long, slender, pale, dryish, sulcated, densely scaly; scales persistent, red-brown, of various sizes. Frond 8 in.–9 in. long, oblong-ovate, tripinnate, rhachises and petioles of pinnules scaly; pinnæ alternate, regular, distant (1 in.–1½ in. apart on main rhachis), 3 in. long at middle of frond, the 3 lower pairs slightly decreasing in size; pinnules distant, petiolate; petioles slender, rather long, decurrent to next pinnule (sub-pinnatifid), margin thickened; the basal [454] pinnules usually containing 5 segments, their

sides entire, bases cuneate excised; tips largely toothed or sub-lobed, each lobe containing a single sorus, but 2 on the larger lower lobes; veins few, somewhat sub-flabellate and simple, not extending to margin, their tips thickened. Sori sub-marginal, situated on the inner vein of segment. Involucre small, 1 line long, linear-oblong, very membranous, transparent, filled with numerous closely-crinkled veinlets having double walls; margin crenulate.

Hab. Dry sides of hills, shady woods south of Dannevirke, County of Waipawa (where it is plentiful); 1888, 1889: W.C.

Obs. A very symmetrical neat species, differing considerably from other known New Zealand species of this genus, though approaching the preceding one (*A. ornatum*), and also *A. hookerianum*, var. *adiantoides*; and somewhat distantly resembling small specimens of *A. bulbiferum*, but very dissimilar from that plant in texture, colour, and dense persistent scales, in its slender and dry stipes, its narrower and more distant stipitate segments, which are also laciniate-lobed, &c., and in the position of its sori, with their peculiarly-veined involucres.

Order V. HEPATICÆ.

Genus 7. *Gottschea*, Nees.

G. clandestina,⁵⁹² sp. nov.

592 *Schistochila repleta* (Hook.f. & Taylor) Steph.

Plant small, $\frac{3}{4}$ in.–1 in. high, 3–4 lines wide at top, sub-obovate tapering, sub-erect, scattered; stems simple, white, succulent, glossy, the smaller specimens leafy to base, the larger ones with numerous dark-purple rootlets on their lower half; leaves ovate-dimidiate, with 2 small plaits at each apical margin; anterior margin laciniate-serrate, the basal half largely so; posterior margin almost entire, with 3 (or 4) distant minute teeth; the lower leaves distant, smaller and subfalcate, their tips rounded entire; the upper leaves imbricated, sub-acute, their tips finely serrate; dorsal lobe two-thirds length of leaf, its anterior margin entire rounded and produced beyond leaf, the lower margin straight, at some distance within that of leaf, its junction-ridge thickened, produced, serrulate; tip truncate, entire. Stipule large for plant, broadly elliptic, $1\frac{1}{4}$ lines long, margined, bifid, each lobe largely trifid at top, with 1–2 coarse teeth on each side; laciniæ large, irregular, margins sinuate, acute not ciliate; sinus long, narrow, irregular, with 2 teeth at bottom near base, 1 on each side. Cells large, sub-quadrata-orbicular, irregular, distant, not clear, filled, guttulate and many-beaded.

Hab. Scattered among dense patches of *Aneura polymorpha*, Col. (*infra*), low wet woods south of Dannevirke, County of Waipawa; 1889: W.C. [455]

Obs. A very neat little species, allied to *G. marginata*, Col. ("Trans. N.Z. Inst.", vol. xviii., p. 241), but differing in several characters. Its place and manner of growth, nearly hidden among the close-growing and erect *Aneura*, is peculiar; and it is not easily detected.

Genus 8. *Chiloscyphus*, Corda.

1. *C. involucrata*,⁵⁹³ sp. nov.

Plant creeping, 2 in.–3 in. long, 1–1¼ lines broad, symmetrical, regular, distantly branched; light-green. Branches very few, alternate, divergent, simple rarely sinuate, rooting largely at stipules; roots long, tubular, white, hyaline. Leaves numerous, very close throughout, densely imbricate, decurrent, broadly ovate-deltoid with apex truncate; margins sub-sinuate; tips 2-horned, a horn at each extreme angle, long, divergent, broad, 4-celled transversely at base, the upper horn usually longer; sinus deep, sides sinuate, the centre (at base) notched. Cells large, orbicular with beaded centres, and minute triangular intermediate cellules; cell-walls stout, conspicuous. Stipules large, extending across stem, connate with leaves below, 4-fid, each of the two inner lobes having a small lobule or tooth on its outer margin. Fruit terminal on a short basal branch; sometimes two such branches are near each other on the same side of stem. Involucral leaves large, connate, spreading, and (with perianth) darker green, their tips laciniate; laciniæ long, flexuous. Fruit-stalk slender, erect, ½ in. long; capsule small, elliptic, blackish.

Hab. Rooting, mostly hidden, among, and epiphytal on, small cæspitose *Aneura polymorpha*, Col. (*infra*), on rotten logs, low wet woods south of Dannevirke, County of Waipawa; 1889: W.C.

593 *Lophocolea* sp.

Obs. A neat species; pretty closely allied to *C. spruceana*, Col. ("Trans. N.Z. Inst.", vol. xxi., p. 59).

Genus 13. *Lepidozia*, Nees.

1. *L. retrusa*,⁵⁹⁴ sp. nov.

Plant small, single, sub-erect, 1 in. high (rarely above, mostly under), 3–6 lines wide; main stem brownish; cells parallelogrammic, pinnate (very rarely bipinnate), branches alternate, distant, tips flagellate; flagellæ long, capillary, flexuous, pale, with small scattered bundles of long white hyaline rootlets. Leaves numerous close imbricate concave, palegreen their margins darker green, sub-quadrata, 4-fid; lobes extending one-third of leaf, broad, triangular, divergent; margins slightly sub-sinuate; sinuses wide; cells distinct, sub-quadrata-orbicular, regular in size, guttulate, obscure. Stipules rather distant, small, broadly ovate; tips slightly 2–3-toothed; cells [456] connected, regular, clear, parallelogrammic; walls narrow, black. Fruit at base of branch near middle of main stem, solitary, rarely 2 on a plant, and when so then near each other. Involucral leaves adpressed, broadly elliptic, nearly entire, their tips mucronulate. Perianth white, oblong, 1 line long, sub-acute, plaited, tip slightly toothed; cells as in stipule. Capsule narrow-oblong, tip obtuse, base truncate broader than fruit-stalk; elaters nearly straight, closely twisted, ends obtuse.

594 *Lepidozia laevifolia* (Hook.f. & Taylor) Gottsche, Lindenb. & Nees var. *laevifolia*.

Hab. On rotten logs, completely hidden among patches of *Aneura polymorpha*, Col. (*infra*), low wet woods south of Dannevirke, County of Waipawa; 1889: W.C.

Obs. This is a neat little species; the great regularity of its concave leaves, with their coloured margins, give it a pleasing and striking as well as distinct appearance. Its affinities, however, are with small specimens of *L. capilligera*, Lindb., and *L. lavifolia*, Hook.f., and also *L. minuta*, Col. ("Trans. N.Z. Inst.", vol. xviii., p. 245).

2. *L. occulta*,⁵⁹⁵ sp. nov.

Plant small, very slender, prostrate, lanceolate, pinnate, main stem 1½ in. long, 4–5 lines wide at middle, much and very closely branched; branches opposite and alternate, usually short, simple rarely pinnate, decreasing gradually in length towards apex and base. Leaves and stipules close, spreading, 3-fid to base, their lobes long setaceous, usually 5-jointed; tips sub-imbricate, finely capillary, flexuous. Fruit sub-sessile on main stem at base, also about the middle. Involucral leaves adpressed, sub 3 rows, tips laciniate; laciniae narrow, their tips obtuse. Perianth large for plant, darkish-green, linear-ovate, 2 lines long, slightly curved, tip acuminate subacute, laciniate and ciliate; cells long, narrow, parallelogrammic.

Hab. Rooting concealed (with preceding species, *L. retrusa*) among patches of *Aneura polymorpha*, (*infra*), low wet woods south of Dannevirke; 1889: W.C.

595 *Telaranea lindenbergii* (Gottsché) J.J. Engel & Merrill var.
lindenbergii.

Obs. A distinct neat little species; in general appearance approaching small plants of *L. capilligera*, Lindb., and *L. lindenbergii*, Gottsche.

Genus 32. *Aneura*, Dumort.

1. *A. perpusilla*,⁵⁹⁶ sp. nov.

Plant very small, dark emerald-green, of densely-compact growth; main stem horizontal, creeping, closely appressed and thickly rooted, 3–4 lines long, $\frac{1}{25}$ in. wide, bipinnatifid; branches (fronds) $1\frac{1}{2}$ lines long, erect, closely compacted, 3–5-fid (usually 3-fid at tip), segments about one line long, linear-subulate, obtuse, incurved. Fruit at base of frond, [457] usually solitary, sometimes two together. Involucre minute, very shallow, irregularly and distantly toothed; teeth acute. Calyptra 1½ lines long (nearly as high as frond), white, glabrous, cylindrical, erect, obtuse; tip urceolate. Seta 3 lines-long, white, hyaline, glossy. Capsule narrow-oblong, brown; valves narrow-linear, striate, sub-acute; elaters brown, forming large pencilled masses at tips.

Hab. On very rotten wet logs, low woods south of Dannevirke, County of Waipawa; 1889: W.C.

Obs. A curious minute species, forming extensive patches completely covering the surface of log, and somewhat resembling coarse green plush. It is allied to *A. muscoides*, Col. ("Trans. N.Z. Inst.", vol. xviii., p. 251), but is very distinct.

596 *Riccardia lobulata* (Colenso) E.A.Hodgs.

2. *A. polymorpha*,⁵⁹⁷ sp. nov.

Plant of densely-cæspitose growth, firm, somewhat brittle, bright emerald-green; roots brownish, thickish, succulent, irregular, spreading; fronds erect, of nearly uniform height in appearance, 6–9 lines high, $\frac{1}{2}$ line to 2 rarely 3 (usually $1\frac{1}{2}$) lines wide, of various shapes and sizes, simple narrow-linear cuneate and oblong-obovate, two-branched from base, subpalmate and flabelliform with 3–5 branchlets; branchlets irregular and spreading, subpinnatifid, margins distantly and slightly incised, sinuate, sub-crenately knobbed and notched, tips incurved, always broader and crenulate. Cells numerous, small, oblong-lanceolate, each having a free central oblong dot. Fruit usually single at base of frond, sometimes 2, rarely 3–4, together, yet, in one specimen, 7 near each other. Involucre short, pubescent, margin sharply sub-serrulate. Calyptra cylindrical, erect, 2 lines long, white minutely speckled, puberulent, the tips slightly produced and ragged; hairs light reddish-brown. Seta 9–12 lines long, slender, curved, shining, hyaline, striate, multi-septate and closely so at top. Capsule narrow-oblong; valves linear-oblong, subacute and submucronulate, dark-brown, darker at tip and at base, margined, thickly striate, with dark linear dots in regular lines between striæ. Elaters closely twisted, tips very acuminate, acute.

Hab. On rotten logs, low wet woods south of Dannevirke, with preceding species (*A. perpusilla*), but forming separate patches; 1889: W.C.

597 *Riccardia bipinnatifida* (Colenso) Hewson.

Obs. This plant forms large spreading patches, very closely growing like a short moss, covering the whole surface of the log. It changes its colour soon after removal, even when kept alive in water. It has intermixed with it two minute species of sub-erect *Lepidoziæ*, which are always lower than the *Aneura*, and are not found without breaking it up—*L. retrusa*, and *L. occulta*, Col. (*supra*). [458]

Order VIII. FUNGI.

Genus 60. *Peziza*, Dillenius. (§ *Lachnea*.)

1. *P. (L.) spencerii*,⁵⁹⁸ sp. nov.

Gregarious, often sub-coalescent and adhering at base in small clusters, partly imbedded in the soil, and fixed by the centre and by a few small divergent rootlets. Cup sessile, of various shapes and sizes, usually more or less globular depressed, $\frac{1}{2}$ in.— $1\frac{1}{2}$ in. diameter, urceolate, at first nearly closed, afterward opening circularly, and often becoming explanate, breaking into several irregular and large ragged lobes; thickish, fleshy, somewhat brittle; margin thin, slightly and irregularly lacerate and toothed, recurved: *outwardly* dirty-white inclining to a lightish-brown, roughish, deeply wrinkled below; wrinkles smooth, sub-radiating from the centre, slightly yet thickly puberulent in depressions, particularly about the base; hairs white: inwardly light reddish-brown, very largely wrinkled yet smooth; ascus broadly linear, cylindrical,

598 *Peziza vesiculosus* Bull.

regular, $\frac{1}{1300}$ in., containing 8 sporidia; sporidia elliptic, free, distinct, obliquely posited, $\frac{1}{1200}$ in.; nucleus (apparently) single, as in some other of our described New Zealand species, or 0; paraphyses slender, $\frac{1}{4000}$ in., 3-septate at top.

Hab. On the bare ground in the garden of W. I. Spencer, Esq., F.L.S., Scinde Island, Napier; Sept., 1889.

Obs. I. This is the largest species of *Peziza*, yet found in New Zealand. It has a very striking appearance when fresh, and grew pretty plentifully in one spot of a few square yards. Dr. Spencer (to whom I am again indebted both for specimens and the accurate microscopical measurements given above) informs me that, though plentiful, he had only noticed them in that part of his garden which had lately received a quantity of fresh stable-manure; and also, "with respect to the nuclei, mine show no nucleus, but a quantity of granular matter; they also exhibit a very distinct *hilum*, with faint concentric elliptical lines, not unlike what is seen in starch-grains; however, they do not polarize light, so they are not starch granules: others are filled with fine granular matter, and do not show the *hilum*. I examined sporidia not only in the asci, but also many that had been extruded, and which I therefore presumed to be mature. It would be interesting to know whether these intercellular bodies ever make their appearance, and, if so, at what stage." (Dr. Spencer, *in lit.*)

II. While my specimens were drying I observed, on my placing them in strong sunlight, that their sporidia were ejected in cloudy puffs, with apparently elastic force, and

this was caused by the least agitation in carefully removing them.

**1889 A Description of some Newly-discovered
Phænogamic Plants, being a Further
Contribution towards the making-known the
Botany of New Zealand.**

Transactions of the New Zealand Institute 22: 459-493.

[*Read before the Hawke's Bay Philosophical Institute,
13th May and 7th October, 1889.*]

THE plants contained in those two papers are here placed together systematically, so as to avoid repetition of orders and genera. Those described early (in May), in the first paper, were all from the mountainous interior, East Taupo County, and collected by Mr. Hill; while those in the later paper (in October) were mainly from the lowland forest region near Dannevirke, collected by W. Colenso and by Mr. A. Hamilton, and also from near the sea on the East Coast.

Order XXII. LEGUMINOSÆ.

Genus 1.⁵⁹⁹ Carmichælia, Br.

599 WC: The numbers attached to the orders and genera in this paper are those of them in the "Handbook, Flora of New Zealand."

1. *C. orbiculata*,⁶⁰⁰ sp. nov.

A very small erect rigid shrub of 2 in.–3 in. high, whose main stems are prostrate and under soil (and ever-shifting volcanic sand), much and closely branched, forming large flat patches somewhat resembling a coarse doormat; branchlets $\frac{3}{4}$ in.–1 in. long, erect, rigid, simple, linear, flat, 2 lines wide, coarsely but regularly striate, yellow-green, their tips very obtuse, dark-yellow with blackish (ustulate) margins, their lateral margins irregularly and distantly notched, each notch having a scarious light-brown ciliated appressed triangular bract. Flowers in small sub-corymbose panicles usually 3–5 together; peduncle rather long and (with pedicels) slightly pilose, each pedicel decurved, with 1–2 small ovate brown bracteoles, their margins pilose-ciliate. Calyx rather large, green, cup-shaped, inflated, with 5 acute blackish teeth, the sinuses large rounded. Corolla pinkish-lilac; standard orbicular, slightly emarginate, 2 lines diameter, much veined. Anthers connate nearly to tips. Stigma sharply papillose. Pod green, glabrous, slightly rugulose, orbicular sometimes broadly elliptic, 3 lines diameter; beak long, slender, very much recurved; replum stout; 1-seeded. Seed orbicular-cordate, sides unequal, dull-green spotted with purple.

Hab. Desert of Rangipo, near Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.* [460]

Obs. A very interesting little species, in size and habit of growth allied to *C. nana*, Col., from the same mountainous locality; but widely different from that

600 *Carmichaelia nana* (Hook.f.) Hook.f.

species in several important characters. Its very peculiarly-shaped and unique pod distinguishes it from all its known congeners.

Order XXVI. DROSERACEÆ.

Genus 1. *Drosera*, Linn.

1. *D. polyneura*,⁶⁰¹ sp. nov.

Plant, small somewhat tufted, erect, 1 in.–2½ in. high; root-stock woody, thickish, vertical, 1 in.–2 in. long, black, with many irregular spreading wiry rootlets below; sometimes two plants arise from one stock, each bearing 1–3 flowers and 3–7 leaves. Leaves of two forms, their upper surfaces above the middle and their margins glandular; glands not crowded, flat, long and patent at margins, the single apical one more than two lines long, very short on lamina, their tips elliptic, smooth, dark-red; the outer leaves narrow oblong-ovate spreading, usually deflexed from junction with petiole, 1 in.–1½ in. long, 4 lines wide, many-nerved, tip very obtuse rounded, base tapering; petiole very broad, sub 3 lines, 5-nerved, conduplicate, clasping; the inner leaves longer, linear, 1½ lines wide, erect. Scape erect, 1½ in.–2 in. long, shorter or longer than leaves, 1-flowered, with a long linear basal leaf (or bract) ¾ in.–1 in. long, glabrous, eglandular, margins closely incurved, tip obtuse, and a minute linear bracteole near the top of scape. Calyx-lobes not cut to base, sub-oblong-ovate, 3-nerved, tips obtuse, toothed. Corolla 4 lines diameter, scarcely longer than calyx, not

601 *Drosera arcturi* Hook.

spreading, pale yellowish-white, very membranous; petals narrow obovate, tips slightly obtuse, margins irregular, 3-veined, veins dark, branching. Stamens 5, much shorter than corolla; filaments flat, 1-nerved; anthers orbicular, bright-yellow, perigynous between petals. Styles 4, each nearly 1 line long, thick, spreading; stigmas large, globose, fimbriate; fimbriæ branched, their tips globular. Ovary narrow oblong-obovate, black, shining, 3-valved, minutely papillose, much longer than corolla.

Hab. Swampy spots, base of Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. I. At first sight, and without close examination, this little plant may easily be taken for its near ally *D. arcturi*, Hook., which it much resembles; but it possesses many grave and different characters—in its two forms of leaves, its scape-bracts, its smaller membranous flowers with differently-shaped lobes to both calyx and corolla, and its 4 separate styles. [462]

II. The description of *D. arcturi* in the “Flora N.Z.,” and in the “Handbook, Flora N.Z.,” differs pretty considerably from the typical description, with its drawings and dissections, of that Tasmanian plant: fortunately I possess them all, and from them I here append some of its peculiar specific characters, in order to show the great difference between these two species.

III. *Drosera arcturi* was first briefly described by Sir W.J. Hooker in 1834, in his “Journal of Botany,” where he also observes, “The flower of this very fine species is as large as that of *D. binata*.” Three years after, in 1837, in vol. i. of his “Icones Plantarum,” tab. lvi., Sir W.J.

Hooker gives a drawing of this plant, with dissections; where he also repeats what he had formerly said respecting it, adding, "The *large* solitary flower will at once distinguish it from every other species." In the drawings given the calyx-lobes are narrow, sub-acute, regular, and cut to base; the corolla very much larger, with the tips of its large lobes rounded, and their scapes twice the length of its leaves, which are also only of one form ("linear-spathulate").

IV. Sir J.D. Hooker, also, in his "Flora Tasmaniæ," similarly describes this species, but much more fully: he says, "Foliis linearibus.... sepalis lineari-oblongis, obtusis,.... petalis erectis coriaceis lineari-spathulatis obtusis, coriaceis,.... stylis 3 indivisis." And again (in English), "A most distinct and beautiful species, 3 in. to a span high;.... leaves 2 in.–6 in. long.... 1-nerved, covered with spreading glandular hairs. Scape longer than the leaves. Flowers nearly $\frac{1}{3}$ in. long.... Sepals linear-oblong, blunt.... Petals one-third longer than the calyx. Stamens 5, persistent. Ovary oblong, with 3 short styles, and globose papillose stigmata."

V. Moreover, in his describing *D. stenopetala* (another New Zealand species), he says, "This plant and the *D. uniflora* of Fuegia and the Chilian Andes form a peculiar group of this genus, differing from most others in the one-flowered scape, and from all in the styles being divided to the base" ("Flora N.Z.," vol. i., p. 19)—which is also the case in this species.

2. *D. triflora*,⁶⁰² sp. nov.

A small stemless species. Roots 2–3, very long, vertical, rather stout, wiry, black, finely shaggy below. Leaves rosulate, spreading, 15–18, orbicular, 2 lines diameter, red (as also glands), lamina thickish, the under-surface glabrous, roughish; glands very large, spreading, flattish, covering lamina on upper surface and partly on petiole; petiole 3 lines long, flat, broad, glabrous, dark-greenish; stipules large, [462] sub-scarious, brownish, tips bifid and much and sharply lacinate, cells oblong, minute; with additional transverse stipules or scales on petiole at base below and in front of lateral stipules, sub-quadrata, 1 line broad, the top deeply lacinate with 7–8 long acuminate laciniæ. Scapes rather stout (for plant), the main (or central) one $\frac{3}{4}$ in. long, erect, bearing at top 3 flowers (rarely 2) in a sub-fascicled corymb; pedicels $\frac{1}{15}$ in. long, with 2 minute bracteoles together at their fascicled base; other scapes axillary, simple, their stems $\frac{1}{2}$ in. long, 1-flowered, with a single small bracteole below calyx. Calyx broadly campanulate, $\frac{1}{10}$ in. long, dark-red, 5-lobed; lobes cut nearly halfway to base, rounded and sub-acute; tips thin, many and sharply toothed; teeth irregular; veined, veins many, prominent, branching. Corolla (damaged) whitish, small, extending but little beyond calyx.

Hab. Swampy spots, base of Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

602 *Drosera spatulata* Labill.

Order XXVII. HALORAGEÆ.

Genus 1. Haloragis, Forst.

1. *H. bibracteolata*,⁶⁰³ sp. nov.

A small spreading ascending few-branched wiry herb; branches 5 in.–7 in. long, wiry, few-leaved. Leaves opposite in pairs, distant (1 in. or more apart), petioled, broadly oblong, sub-acute, 2–3 lines long, reticulate, margins thickened, white, recurved, usually with 3 coarse and deep curved laciniate serratures on each side, which also have thickened margins, upper surface glabrous, the lower hairy, also petioles and stems; petioles short.

Flowers axillary, solitary, peduncled, opposite (generally 2 pairs) at tip of branch, 3–4 lines apart. Nut small, with flower 1 line long, smooth, glossy, purple, obtusely 4-angled, turgid; 2 appressed bracts at base, glabrous, ovate-lanceolate; peduncle very short, slender. Calyx-lobes erect, deltoid-acuminate, margins thickened and recurved, with a thick central line resembling a midrib. Stigmas 4, sessile, large, spreading, echinately bushy; hairs coarse, septate-moniliform, obtuse. Anthers linear, truncate, emarginate, yellowish, pendulous. Petals 0.

Hab. Dry spots, sides of Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. I. A species having pretty close affinity with *H. depressa*, Hook.f., but differing from that species in its leaves being glabrous, smaller, and petiolate, with different serratures, and not “slightly scabrid on each

603 *Drosera spatulata* Labill.

side;" also, in its nut being much smaller, less angled and costate, with 2 bracts, and in its very different stigmas.

II. Bentham, in his more full and more recent description [463] of *H. depressa* (it being also an Australian plant), says, "Leaves small, entire or slightly toothed,.... scabrous with minute asperities;.... fruit with 4 or 8 prominent nerves." And, again, "There are two forms of this species: 1. *serpyllifolia*. Leaves mostly under 3 lines long and rather narrow. *Goniocarpus serpyllifolius* and *G. vernicosus*, Hook, f., in Hook. 'Ic. Plantarum,' tt. 290 and 311. And, 2. *montana*. Leaves broader, often cordate, 3 to 5 lines long." I have the drawings, with dissections, of both those species (or forms), which differ largely from this plant here described; besides, I know *H. depressa*.

Order XXVIII. MYRTACEÆ.

Genus 2. Metrosideros, Br.

1. *M. speciosa*,⁶⁰⁴ sp. nov.

"A small tree, bushy at top, about 25 ft.-30 ft. high; probably a climber" [Mr. Hamilton]; wholly glabrous. Branchlets sub-4-angled, bark dark reddish-brown. Leaves oblong and oblong-lanceolate, obtuse, 1 in.-1 $\frac{3}{4}$ in. long (attaining to 2 $\frac{1}{2}$ in. on young luxuriant barren lateral shoots), decussate, distant $\frac{1}{2}$ in.- $\frac{3}{4}$ in., spreading, petiolate, dark-green alike on both sides, plentifully dotted with large and small dots, glossy on upper surface, midrib stout, much veined, lateral nerves oblique,

604 *Metrosideros scandens* (Forst.) Druce.

irregular; petioles 1–2 lines long. Flowers stout, large, in small terminal and sub-terminal corymbs (sub 11-flowered); peduncles (and pedicels) rugulose and dark-coloured, slender, $\frac{3}{4}$ in.–1 in. long, with 3–4 minute transverse ridgy equidistant bracteoles, and also 1 at base of pedicel; secondary peduncles 3 lines long; pedicels very short; flowers disposed in heads of 3, and when terminal of 5. Calyx infundibuliform, smooth, thick, 8 lines long; lobes large, broad, rounded, concave, persistent; margins membranaceous and dotted. Petals 5, large, sub-orbicular, showy, 3 lines diameter, orange with a reddish (or pink) tinge, veined, thickly dotted with large dots; margins entire at tips, slightly erose at sides; claw broad, short. Stamens (and style) dark-red, 8 (rarely 9) lines long, flat, thin; anthers oblong, red; pollen (plentiful) bright-yellow (gamboge); style stout, erect, 1 in. long, much longer than stamens. Fruit not seen.

Hab. Forest-clearing, 1 mile north of the Waikanae Railway-station (Manawatu line); April, 1889: *Mr. A. Hamilton.*

Obs. This species is pretty closely allied to *M. florida*, Sm., but differing in several particulars—viz., in general colours of bark, leaves, and inflorescence, which are all much darker; in its angled branchlets, in the position form and venation of its leaves, in its smaller heads of flowers with their larger and more vividly-coloured petals stamens and styles, in its longer [464] styles far exceeding the stamens, and in its larger and more richly coloured anthers. In its flowering state it is a strikingly handsome plant.

Order XXXVIII. RUBIACEÆ.

Genus 1. Coprosma, Forst.

1. *C. aurantiaca*,⁶⁰⁵ sp. nov.

An erect rather rigid thickly-branched glabrous shrub, 8 ft.–10 ft. high; bark brownish. Branches opposite, spreading, sub-rigid, patent; branchlets minutely and thickly puberulent. Leaves lateral in opposite pairs, and 2–4 together fascicled at tips of small branchlets, oblong and oblong-obovate, 5–7 lines long, 2½–3½ lines broad, glabrous, green, somewhat thickish, margins sub-sinuate red; tips rounded, sometimes slightly apiculate, minutely ciliolate; much reticulately veined, veins not prominent; tapering to base of petiole; petiole very short, glabrous. Stipules very small, sub-ovate, thickish, puberulent.

Flowers: *Male*, sub-sessile, axillary, solitary in opposite axils, and sometimes 3 together. Calycine lobes 4, connate; 2 of them large oblong obtuse, opposite, margins entire; and 2 small, their tips irregularly toothed, coloured, their edges minutely ciliolate. Corolla broadly campanulate, greenish dashed with purple streaks, 2 lines long, 3 lines diameter, 5-cleft cut three-fifths to base; lobes sub-oblong-ovate, sub-acute, spreading, much recurved, 1-nerved with branching veinlets at tips.

Stamens 4, much exserted, pendulous; filaments puberulous; anthers one-third length of filaments, oblong, striate; tip obtuse; base sagittate. Fruit solitary, globular, size of a small pea, stalked, clear golden-yellow, very sweet. Seeds narrow-oblong, 2 lines long, white, thickish,

605 *Coprosma rigida* Cheeseman.

gibbous and deeply striate on the outside, flattish and smooth on the inside.

Hab. On low flats, sides of streams, open lands south of Dannevirke, County of Waipawa; 1886–89: W.C.

Forming dense impenetrable thickets; also, but more sparingly, in similar localities near Norsewood; 1884: W.C.

Obs. This plant has been known to me for some time, especially in its fruiting state, when it is a conspicuous object even at a distance, from the profusion of its bright golden fruit. Its flowering-season must be both early in the spring and soon over, for I had visited the shrubs late in August, when there were no signs of flowers; and again afterwards early in October, when there was not one remaining of the female, and only a very few of the male flowers. At the same time the many other species of *Coprosma* close by had scarcely yet expanded their flowers. Through my not having met with perfect flowering specimens, I had delayed describing the plant. [465] Its leaves lose their colour in drying, becoming yellowish.

2. *C. lentissima*,⁶⁰⁶ sp. nov.

A small sub-erect slender weak glabrous shrub, 4 ft.–5 ft. high; bark pale-brown, on its younger branches slightly yet closely puberulent; branches few, distant, very long and straggling, often simple, the younger ones sub-tetragonal; branchlets mostly simple, very slender and very long, 12 in.–18 in. and upwards, often supported by other neighbouring shrubs and plants. Leaves not

606 *Coprosma rigida* Cheeseman.

numerous, in distant opposite pairs, almost regularly disposed sub 1 in. apart on their long branches, oblong and sub-oblong-obovate, 5–7 lines long, 3–4 lines broad, membranous; margins entire, thickened, and slightly recurved; tips rounded; veins much reticulated but nearly obsolete; dull-green above, paler below and shining; petiole short, 1 line long, slender, glabrous. Stipules small, broad, somewhat sub-quadrangular, minutely ciliolate. Flowers: *Male*, axillary and at tips of very short lateral branchlets (1–3 lines long), usually 4-fascicled (sometimes 3 or only 2), shortly-peduncled, glabrous. Calyx small, green. Corolla (unexpanded) oblong, 2 lines long, green, striate; tips slightly ciliolate. Anthers (immature) long, narrow linear, dark-purple. *Female* flowers and fruit unknown.

Hab. Outer edges of woods, open plains south of Dannevirke, County of Waipawa; 1889: W.C.

Obs. This is a very peculiar species, from its long slender simple and very pliant branches. Its leaves and *male* flowers resemble (*prima facie*) those of the preceding species (*C. aurantiaca*), but the size, form, habit, colour, and general appearance of the two plants are totally distinct. The leaves of this species, too, are much more regularly disposed, less obovate, thinner in texture, with their margins not coloured and tips not ciliolate, and of a paler green, keeping their colour in drying; the petiole longer and more slender; its calycine lobes are also much smaller. Although I have known it for some time, and often visited its locality, where it is common (yet at the wrong seasons), I have not met with female flowers or fruit.

3. *C. orbiculata*,⁶⁰⁷ sp. nov.

Shrub small, erect, 5 ft.–7 ft. high, slender, graceful, much branched above, bark smooth, light-brown; branches short, opposite, patent; branchlets small, very slender, pubescent; hairs short, light-grey. Leaves numerous, orbicular, 3–4 lines diameter, often a little broader than long, sometimes minutely apiculate; margins slightly recurved; lamina rather abruptly contracted at petiole, membranous, light-green [466] on both sides, glabrous, sub-trinerved, veins much reticulate; petiole slender, $\frac{1}{10}$ in. long, pilose. Stipules small, connate, toothed. Flowers: *Male*, mostly on small branchlets, axillary and lateral, opposite, 2 together (sometimes solitary), shortly-peduncled. Calyx small, 4-lobed (2 of them larger); lobes triangular-ovate; tips slightly ciliolate. Corolla small, campanulate, $\frac{1}{10}$ in. long, green purple-dashed the base purple, glabrous, 4-cleft, cut half-way down; lobes obtuse, 1-nerved, spreading, recurved, papillose-ciliate at tips. Stamens 4, exserted, 3 lines long; filaments 2 lines long, slender, thickened at top, papillose; anthers white, narrow-oblong, 1 line long, tip obtuse, base sagittate. *Female* flowers and fruit unknown.

Hab. Shaded forests south of Dannevirke, County of Waipawa; 1889: W.C.

Obs. This is a very neat-looking species, of a pleasing green colour (which it also in great measure retains in drying): the regularity of its many small and round leaves, on its patent almost horizontal spreading

607 *Coprosma rhamnoides* A.Cunn.

branches, serves greatly to enhance its graceful appearance. It is one of the common undershrubs of those deep forests, and the sole reason of my not detecting any *female* flowers was my being there too early in the season. It is very distinct from all other species of *Coprosma* known to me.

4. *C. perpusilla*,⁶⁰⁸ sp. nov.

Shrub small, depressed; main stem prostrate and creeping (under soil?), 4 in.–6 in. long, rooting at nodes from lower surface; bark pale, glabrous. Branches secund, erect, about 1 in. high, opposite in pairs, simple, few-leaved; young stems glabrous, sub-succulent. Leaves very close, imbricated, thickish, elliptic, 2 lines long, obtuse, glabrous, dark-coloured; upper surfaces minutely and closely papillose; margins entire, thickened and slightly recurved; veined (seen between eye and light); veins branched, anastomosing near margins; tapering to petiole; petiole short, broad, 1-nerved; leaves smaller and narrower (1 line long) at tips and around flower. Stipules narrow, somewhat crescent-shaped, finely ciliolate. Flowers: *Male*, solitary, terminal; calyx small, thick, 4-lobed, cut to base; lobes deltoid-ovate, obtuse. Corolla thickish, broadly tubular, 2½ lines long, 4–5-lobed; lobes sub-acute, one-third length of tube, 1-nerved; margins and tips papillose and sub-fimbriate. Stamens 3, 4 (sometimes 6), exserted; filaments very long, 4–5 lines, pendulous; anthers linear-oblong, 1½ lines long, apiculate, sagittate. *Female* flowers not seen.

Hab. On low banks of River Wangaehu, near east base of Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. A species having pretty close affinity with *C. repens*, Hook.f., and *C. pumila*, Hook.f. (inhabiting also the same [467] mountain region), but, I think, clearly distinct from both. I received but a few small specimens of this plant, and half of them were destitute of flowers.

Order XXXIX. COMPOSITÆ.

Genus 1. *Olearia*, Mœnch.

1. *O. ramuliflora*,⁶⁰⁹ sp. nov.

A tall erect much-branched shrub, 8 ft.–10 ft. high; branchlets opposite, very long, slender, erect and drooping, often simple, angled, striate, bark reddish-brown. Leaves few, small, opposite, fascicled usually in fours, distant, sub $\frac{3}{4}$ in.–1 in. apart on branchlets, or springing from knobbed nodes with 2–3 small obtuse brown hairy bracts at base, linear-spathulate, 3–4 lines long, 1 line broad, obtuse, rather thickish; margins entire, recurved; tapering into petiole 1 line long; dark-green and glabrous above (but young ones with a few scattered weak sub-strigillose hairs), whitish below with fine closely-appressed hairs which are reddish on petioles, and also on midrib when young; hairs narrow lanceolate, peltate. Heads numerous, 2–4-fascicled together with the leaves (sometimes but rarely solitary), broadly campanulate, 3 lines long, on long slender peduncles 3

609 Possibly *Olearia virgata* Hook.f.

lines long, curved, pubescent, bibracteate; bracts opposite, ovate, acuminate, spreading, pubescent. Involucral scales 12, in 2 (sub 3) rows, spreading, strigosely hairy, sometimes glabrous; the outer generally 5, short, linear-ovate; the inner 7–8, linear, obtuse, 2 lines long, tips woolly and, with margins, much ciliate. Florets generally 12; of the disc 4, the ray 8, whitish, their tubes and 2 lobes of the disc-corolla slightly hairy; hairs long, straight; tube of ray-florets very short, its limb largely trifid; lobes linear, 1-nerved; stigma very long, glabrous, dark-coloured; style of disc-floret flattish, veined; stigma (sometimes trifid) long, spreading, each lobe 1-nerved; tips acute, dark-coloured, roughly tuberculate; tubercles linear. Pappus few, erect, shorter than floret, white, shining, slightly scabrid, not thickened at top; tips acute. Receptacle small, pitted, ridgy. Achene small, linear, $\frac{1}{20}$ in. long, dark-coloured, glabrous, with a few short pale spreading hairs at top.

Hab. Sides of streamlets, open ground, south of Dannevirke, County of Waipawa; 1887–88: W.C. (Flowering in December.)

Obs. This species is pretty nearly allied to *O. virgata*, Hook.f.; differing, however, in several important characters—as, in its larger size, its very long pendulous and simple branchlets, its smaller leaves, more numerous fascicled heads, its more and longer involucral scales, bibracteate peduncles, and its greater number of ray-florets, with longer limb. [468]

According to Bentham's arrangement, from the composition of its indumentum this plant will belong to

his Section I., *Dicerotriche*. It is a very handsome shrub when in flower.

2. *O. erythropappa*,⁶¹⁰ sp. nov.

"Shrub 7 ft.-9 ft. high." Branchlets rather long, open, striate; bark pale reddish-brown, hairy; hairs closely appressed. Leaves alternate, distant, sub-orbicular, $3\frac{1}{2}$ in. and 3 in. long by $2\frac{1}{2}$ in. wide, flat, membranaceous, glabrous above (having a few short, scattered adpressed white hairs when young), with closely-appressed light-greyish narrow fusiform peltate hairs below, of a pale-reddish hue when young, finely reticulate; midrib and principal veins below very hairy, dark red-brown; margins sinuate or sinuate-toothed, their sinuses few, large, shallow; base sub-truncate; tip slightly produced, sometimes sub-apiculate; petiole slender, 1 in.- $1\frac{1}{2}$ in. long, striate, hairy. Leaves much smaller and narrower on flowering branches near the flowers, 1 in.- $1\frac{1}{2}$ in. long, oblong and more closely sinuate-toothed or sub-crenate. Heads reddish, in small graceful slender open corymbs, axillary and sub-terminal, 3 in. long, with a long linear brown hairy bract at base of each branch of corymb; peduncle striate, densely covered with red-brown appressed hairs with a few scattered whitish ones; secondary peduncles sub 1 in. long with 3-4 heads on long slender pedicels; pedicels sub $\frac{1}{2}$ in. long, hairy, with a small bracteole about the middle. Head small, spreading, about 4 lines diameter. Involucral scales sub 20 in three rows, the outer shortest, sub-linear-ovate, very hairy; hairs fawn-colour; the middle ones with a central

610 *Olearia arborescens* (G.Forst.) Cockayne & Laing.

hairy line; the inner longest, 2 lines long (twice the length of the others), glabrous, very thin, red-brown, much ciliate. Florets few, sub 20 in all: of the ray, limb narrow recurved, tip with 3 blunt notches, tube rather long, slender, base spreading, hairy; hairs obtuse, somewhat septate or transparent with a dark twisted centre; style long, exserted; stigmas long, spreading, glabrous, curved, tips slightly scabrid: of the disc, corolla glabrous, 6-cleft, tips obtuse, muricated, stem slender, hairy; stigmas scabrid. Receptacle small, pitted, edges slightly scaly. Pappus short, shorter than disc-florets, irregular in length, scabrid, tips acute; the upper portion bright-red, showy. Achene narrow, linear, terete, very hairy.

Hab. Thickets, base of Mount Ruapehu, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. This species differs considerably from all the many indigenous species described by Sir J.D. Hooker: its nearest affinities seem to be with *O. populifolia*, Col. ("Trans. N.Z. Inst.", vol. xiii., p. 243), and *O. suborbiculata*, Col. [469] ("Trans. N.Z. Inst.", vol. xviii., p. 263)—both of these species also obtained from the same interior mountain locality. From its indumentum it will fall under the same section as the preceding.

3. *O. uniflora*,⁶¹¹ sp. nov.

A tall shrub or small tree, "12 ft.—16 ft. high; branches very compact." Branchlets numerous, short, striate, light reddish-brown, pubescent; as also petioles and panicles. Leaves sub-coriaceous, dryish, broadly ovate obtuse, and suboblong-orbicular, 1 in.—2 in. long (but rarely attaining

611 *Olearia paniculata* (J.R. & G.Forst.) Druce.

to 2 in.), $\frac{3}{4}$ in.– $1\frac{1}{4}$ in. broad, base sub-truncate, green, glabrous and shining above, with closely-appressed starry pubescence below of a light fawn-colour, with a reddish hue in the young leaves; coarsely waved; margins entire, whitish, and slightly thickened; very closely and regularly reticulate, reticulations small, sub-quadrata; the rays of the starry indumentum flat, flexuous, and acute; petioles slender, 4–7 lines long, sub-terete, channelled. Panicles axillary and sub-terminal, longer than leaves, compound, loose, erect, slender, somewhat regular in shape, neat; peduncles and sub-peduncles about 1 in. long, each with an adpressed ovate-acuminate bract at its base. Heads small, narrow, rounded, $2\frac{1}{2}$ lines long, usually 2 together and sub-sessile on short secondary sub-peduncles, sometimes only 1 and then pedicelled, always composed of a single tubular floret. Involucral scales green, in sub 3 rows, slightly scurfy and puberulent; the outermost sub-rhombic-ovate, acute; the inner larger, thinner, paler, oblong, tips rounded of a dark lilac-colour with their margins delicately fimbriate; lobes of corolla 5 (sometimes 3), white, narrow, acuminate, entire, much recurved forming a complete revoluted curl, tube smooth; anthers narrow linear acute, orange with a brown line; style long; stigma large, much produced beyond anthers, curved, spreading, yellow, tips sub-spathulate finely tuberculate, their apices coloured pink. Pappus whitish with a reddish hue, irregular, shorter than floret, scabrid, thickened and flattened near the top, tips acute. Receptacle small, glabrous, dark-brown, alveolate. Achenium $1\frac{1}{2}$ lines long, sub-linear-cuneate, terete very slightly compressed, striate, brownish, pubescent in the upper half.

Hab. Hills at Ohariu, West Coast, Cook Strait, near Wellington; and cultivated at Wanstead, near Waipukurau, County of Waipawa: *Mrs. E. Crosse.* Flowering in March, and very sweet-scented.

Obs. According to Bentham's classification, this species will belong to his § II., *Asterotrichie*. [470]

Genus 3. *Celmisia*, Cass.

1. *C. membranacea*,⁶¹² sp. nov.

Plant small, erect, 4 in.–5 in. high. Rootstock vertical, thickish, also horizontal long and slender, sending out long narrow leafy stolons. Leaves sub-rosulate, 8–10, close, spreading, orbicular-elliptic and broadly oblong, $\frac{3}{4}$ in.–1 in. long, membranous, green on both sides, glabrous, minutely glandular on upper surface and margins with depressed circular glands or dots, but not puberulent, finely reticulated, margins slightly revolute and sharply serrate, teeth rather long, curved; petiole flattish, 3–4 lines long. Scape solitary, erect, slender, 3 in.–4½ in. high, thickly glandular pubescent (also involucre), with 5–8 caudine bracts, narrow linear, acute, 3 lines long, equidistant. Head hemispherical, $\frac{3}{4}$ in. diameter. Involucral scales numerous in 4 rows, linear, the inner row longest, 3 lines long, dark-green, 1-nerved, glossy within the apical portion, and tips largely ciliate. Florets very numerous: of ray, 20 or more, limb long narrow, revolute, 4-veined, tip slightly 3-notched, tube very short and slender, glabrous; stigma long, exserted: of disk, 32, corolla infundibuliform smooth, 5–6-lobed; lobes sub-acute; stigmas slightly exserted. Receptacle

612 *Celmisia glandulosa* Hook.f.

deeply punctiform, with irregular and high scaly margins. Pappus shorter than tube of disc-florets, of irregular lengths, scabrid, acute, reddish. Achene linear somewhat quadrangular, striate, sub-compressed, pubescent on striæ, base finely beaked.

Hab. Open lands at Taupo; 1889: *Mr. H. Hill.*

Obs. This species is very near *C. glandulosa*, Hook.f. (a plant collected by me in that same locality), but differs from *C. glandulosa* in having membranous and broader leaves without pubescence, and with differently-formed glands, long petioles, numerous scales to involucre, and a much larger number of florets; its achene also being angled, &c.

2. *C. perpusilla*,⁶¹³ sp. nov.

A very small plant, sub-erect and slightly tufted; root-stock stoutish, straight, 1½ in. long, with many long wiry rootlets at the extremity. Leaves 8–14, linear-lanceolate, sub 1 in. long, 1½ lines wide, margins entire, tip obtuse, pale-green, glabrous above, very cottony closely appressed and shining below, concave, conduplicate. Scape short, as long as leaves, single, erect, leafy, with a few small bracts, very woolly. Head small, 4 lines diameter, spreading. Outer involucral scales 5, broadly oblong, woolly in the centre; the inner 7 linear, glabrous, longer than outer, green and shining below, their tips obtuse, notched, with 1 circular brown spot, [471] margins white, hyaline; florets about 14, very slender almost setaceous, a little shorter than pappus. Receptacle

613 *Celmisia graminifolia* Hook.f.

narrow, ridgy. Pappus few, about 20, scabrid throughout, tips acute. Achene linear-lanceolate, dark-brown, scabrid.

Hab. Swampy spots near Rangipo, eastern base of Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. A small and curious species, of which more perfect specimens are much desired. I have received several plants together in a little lot as collected, but only two of them bear heads of florets, one of these being also immature.

Genus 5. *Lagenophora*, Cass.

1. *L. strangulata*,⁶¹⁴ sp. nov.

Plant small, slender, graceful, erect, slightly tufted; root-stock vertical, long. Leaves 9–13, dark-green, sub-(sometimes oblate-) orbicular, 3–5 lines diameter, base somewhat sub-truncate and abruptly tapering, margins crenate-serrate, usually only 2 serratures on each side, rarely 3 and when so confined to the one side, serratures and tip apiculate, membranous, minutely reticulate, strigosely hairy on both surfaces; hairs long, flaccid, jointed and strangulated, patent, white, shining; margins ciliate, also petioles; petioles very-slender, $\frac{1}{2}$ in.–1 in. long. Scape slender, very long 3 in.–4½ in., with 1–2 minute distant linear acuminate bracts, glabrous below, pubescent above near head, where it is also thickened. Head small 2½ lines diameter, sub-hemispherical; involucral scales 16, disposed somewhat in 3 rows, the outer shortest, linear-lanceolate, glabrous, greenish, the margins above scabrid, tips lacerate and acute. Ray-

614 *Stet.*

florets 14–16, limb linear, very membranous, much recurved, white; tube very short, hairy; hairs patent, short: disc-florets few, about 6, tube slender, sub-cylindrical, 5-cleft, tubercular, tips obtuse; stigmas exserted, tubercular. Achene fusiform, turgid, minutely and thickly tuberculate throughout.

Hab. Among other low herbage, open grounds dry edges of cliffs banks of a stream south of Dannevirke, County of Waipawa; 1888: *W.C. Swamp at Rangipo, eastern base of Mount Tongariro, County of East Taupo; 1889: Mr. H. Hill.*

Obs. A species having close affinity with *L. petiolata*, Hook.f., and also, though not so close, with *L. forsteri*, D.C., and *L. commersonii*, Cass., but differing from them all in its thinner orbicular and reticulate leaves, with their striking silvery septate hairs and fewer serratures, in its numerous involucral scales with lacerate tips, and in its tubercular florets and achenes. [472]

Genus 11. *Cassinia*, Br.

1. *C. spathulata*,⁶¹⁵ sp. nov.

An erect spreading shrub 7 ft.–9 ft. high, of irregular diffuse growth, often 3-branched from base; bark of trunk and branches roughish, grey, with longitudinal fissures and cracks. Branchlets (and leaves below) covered with closely-adpressed pale-yellow tomentum, slightly glutinous when fresh; the branchlets numerous, long, sub-erect and patent, very slender, leafy, scarred. Leaves many, rather close but not crowded, regular, sub-

615 *Ozothamnus leptophyllus* (G.Forst.) Breitw. & J.M.Ward.

decussate, spreading, linear-spathulate, 1–2 lines long, $\frac{1}{2}$ line wide at top, tapering, thickish, green glabrous and shining above; margins thickened, slightly recurved; petiole very slender, decurrent. Heads numerous in terminal sub-hemispherical corymbs, 10–30 (usually about 20 together), narrow, tubular, 2 lines long, light-brown. Involucral scales several, closely appressed, slightly woolly, their margins finely ciliate, when young pale yellowish-green. Peduncles (and pedicels) pubescent, 1–4 lines long, with several small acuminate and opposite bracts, bearing 2–5 pedicellate heads; pedicels slender, 1–3 lines long, each with a small acute bract at base. Florets usually 9–10. Scales between florets linear with sharply-serrated and jagged margins, their tips produced dilated and founded, pure-white, showy, sub-recurved, slightly lacinate. Pappus white, spreading, as long as florets, serrate with broad thickened tips. Achene linear, glabrous.

Hab. Dry hills near the sea, Napier, Hawke's Bay; 1860–89: W.C.

Obs. I have long known this shrub, which grows naturally here in the borders of my paddock on the hill; but until this year I had always supposed it to be one of the described New Zealand species of *Cassinia*—probably *C. leptophylla*. This summer, however (in February), I was attracted to it by its charming and showy appearance, so many hundreds of heads of pure-white flowers, formed by their large recurved scales; and on examination I found it to be a very distinct species. Its spathulate leaves yellowish below and sub-glutinous, larger heads of flowers, their coloured and woolly

involucres, and their prominent white-tipped and largely-recurved floral scales, with the tops of the pappus flattened and coarsely serrate, form good differential characters.

Genus 14. Gnaphalium, Linn.

1. (?) *G. minutula*,⁶¹⁶ sp. nov.

A minute plant of distinct simple growth; rootstock thickish for plant, vertical; rootlets long, wiry. Leaves 6–10, basal, linear, spreading, $\frac{1}{2}$ in.– $\frac{3}{4}$ in. long, $\frac{1}{50}$ in. wide, tips obtuse, dark-green, glabrous above and on midrib below, white and [473] cottony on under-surface, their lateral margins incurved, often twisted. Scape single, $\frac{3}{4}$ in.–1 in. long, slender, almost setaceous, finely cottony, with 1–2 narrow acuminate caudine bracts. Head $2\frac{1}{2}$ lines diameter. Involucral scales about 10, spreading, sub-ovate-lanceolate acuminate, the inner series narrower linear acuminate, thin, light-brown (old), scariosus, glabrous. Receptacle sub-papillose. Pappus sub 20, rather long for plant, white, spreading, flexuous, 2-nerved, scabrid below, upper portion smooth, flattish, tip obtuse. Achene $\frac{1}{24}$ in. long, terete, slightly tuberculate; tubercles linear, patent.

Hab. In boggy ground, near eastern base of Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. This is a remarkable little tiny plant, yet, though very minute, attracting attention at first sight from its pure-white hair-like leaves, when closely incurved, contrasting so strongly on the black soil. Its pappus, on

616 *Euchiton paludosus* (Petrie) Holub.

examination, reveals the most curious structure (as described), which is also constant, and (to me) unique. Although I have received several whole plants (in a little mass), yet only one possessed a floral head, and that old and imperfect, containing only its involucral scales with *one* seed! It may prove to be a species of *Senecio*, or of some other allied genus; yet, for the sake of its peculiar pappus, also of its filiform hair-like leaves, I have ventured to describe it.

**Order XLI. CAMPANULACEÆ.
(Including *Goodeniaceæ*.)**

Genus 5. Selliera, Cavanilles.

1. *S. microphylla*,⁶¹⁷ sp. nov.

Plant very small, creeping, twiggy; main stems hypogæous, a few inches long, much branched, spreading, implexed slender, woody, wiry, very flexuous, rooting at nodes, reddish-brown; branchlets very short, sub $\frac{1}{2}$ in. long, yellowish, their tips only appearing above soil, procumbent, matted. Leaves few, small, much scattered, sometimes 3–4 at nodes, spreading, broadly lanceolate or sub-obovate-lanceolate, about 1 line long (some much smaller), thickish, entire, glabrous; petioles long flexuous, twice the length of leaf. Peduncle terminal solitary, 1-flowered, 1 line long; bracteoles small. Calyx-lobes rather large for plant, long, sub-acute, appressed, thickish, glabrous, shining. Corolla 2 lines long, glabrous, dull-purple, lobes 5 (sometimes 6), rather large,

617 *Stet.*

sub-acute, spreading, with dark veins regularly reticulated. Stamens 5; anthers elliptic, pale-yellow. Style longer than stamens, very stout, dark-brown, with dilated orbicular cup-like indusium, the margin slightly and minutely ciliate. Capsule (old) [474] about 1 line long, turgid, black, containing 7 seeds (in one only 4); seeds orbicular (sometimes irregularly shaped), semi-compressed, slightly convex on one side; margined, pale, shining.

Hab. Swampy ground at Rangipo, eastern base of Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. I. An interesting little plant, received by me in a small turf-like lump of earth, cut out of the ground; its leaves and few flowers closely appressed to the soil, and forming a dense leafy mat, making it a difficult matter to extricate a fair specimen. The small capsules were old (of last year?), broken off from the plants, and more or less injured, but still containing their seeds, which were perfect.

II. This species has evidently pretty close affinity with *S. exigua*, F. Mueller (Benth., "Flora Australiensis," vol. iv., p. 82), another small species from Western Australia; but differs from that plant in several characters.

Order XLII. ERICEÆ.

Genus 1. *Gaultheria*, Linn.

1. *G. epiphyta*,⁶¹⁸ sp. nov.

618 Possibly *Gaultheria antipoda* G. Forst.

Plant a graceful open shrub 3 ft. high; trunk $1\frac{3}{4}$ in. circumference; 9 main branches, distant, leafy, each about 2 ft. long, slender, and drooping, with 8–10 branchlets radiating at top; bark light-brown, rather smooth; branchlets very hairy; hairs long, appressed, springing from muricated dots. Leaves green, alternate, pretty regularly disposed, distant, spreading, sub-membranaceous or very slightly coriaceous, petiolate, narrow oblong, apiculate, 5–7 lines long, margin thickened, recurved, serrate with a long slender mucro within the blunt tooth at tip of a lateral vein; veins much and closely reticulate; young leaves very membranous, flaccid, brownish. Flowers small, rather distant, single, axillary at tops of branchlets; peduncle stout, curved, $1\frac{1}{2}$ lines long, with a few scattered minute narrow patent scales, and 3–4 sub-orbicular or broadly ovate bracts at base, amplexicaul and imbricate (sometimes one single one close under calyx), their apical margins uneven slightly jagged-toothed; tips apicular. Calyx 5-lobed; lobes ovate, sub-acute, entire, cut nearly to base, 1-nerved, pale. Corolla white, sub-urceolate, scarcely 1 line long, lobes 1-nerved, very obtuse, incurved, margins sub-granular-crenulate. Stamens short, muricated; filaments 1-nerved, broadly dilated upwards one-third length from base, margin sub-angular, narrow acuminate above two-thirds length towards anther; anthers orange-red, sub-orbicular urceolate, turgid, 2-awned; awns short, stoutish, incurved, part of and rising immediately and gradually [475] from the anther. Style long, erect, stout, $\frac{1}{16}$ in., simple; stigma muricate- (or ray-) pencilled. Capsule small, sub-orbicular depressed, enclosed by enlarged slightly fleshy dark-red calyx. Seeds of various irregular

shapes, mostly 3–4-sided, shining, finely dotted, light-brown.

Hab. Wood, south of Dannevirke, County of Waipawa; 1887–89: W.C.

Obs. I. This plant is a highly peculiar one: 1. From its precise habitat—epiphytal on a tree-fern, a species of *Dicksonia*, 12 ft. high, and full-fronded, its caudex closely covered with two small climbing-ferns—*Hymenophyllum flabellatum*, Lab., and *Trichomanes venosum*, Br.—in matted growth; and therein, at 4 ft. from the ground, flourishes this *Gaultheria* at an angle of 45°. It is the only instance I have ever known of a *Gaultheria* so growing. A few other forest shrubs and trees, however, are not unfrequently met with in such situations. 2. From its remarkably free, airy, semi-regular, and graceful form, differing much in this respect from the other known New Zealand *Gaultherias*.

II. It is pretty closely allied to *G. antipoda*, Forst. (which grows in profusion on the clifffy heights near), but differs from that and other New Zealand species and varieties in several characters—as in its sub-membranous and mucronate leaves, which are also differently shaped, and otherwise and much more veined, and most particularly in its muricated stamens, which are also of a different form and colour, &c. For some considerable time I supposed it to be a plant of *G. antipoda* (or of one of its varieties) a little altered in growth and appearance from its strange and unique habitat; but on dissection and examination (on my obtaining perfect and complete specimens) I found it to possess very different characters. Several botanists have pretty fully described *G. antipoda*,

Forst., particularly A. Richard, among other New Zealand plants (in his "Voyage de l'Astrolabe: Part Botanique"), who has also given a folio drawing of the plant with good clear dissections, which show the great difference in the form, &c., of its stamens and anthers compared with those of this species. In his copious and clear description of *G. antipoda* he also says (*inter alia*), "Corolla—ovata, laciniis brevibus, revolutis, acutis; stamina—filamentis albis planis, infra medium dilatatis ovalibus basi angustatis; antheræ ovoidæ—apice bilaciniata, laciniis bicruribus; semina sub-ovata" (*loc. cit.*, p. 212). Of course, I am well aware of the many varieties (α , β , γ , δ , ν) given by Sir J.D. Hooker in his "Flora Novæ-Zealandiæ," in the "Handbook" ditto, and in "Flora Tasmaniæ," under his description of *G. antipoda*; but this plant differs from them all. Hitherto, in spite of all my diligent search in those woods, extending over three years, I have only met with this one plant (though *G. antipoda* (*vera*) is both fine and very plentiful in dry open spots in that locality, as I have already noted), so that, should other plants not be fallen in with hereafter, the question may again arise (with others as it did with me) whether this plant is not a sportive form of *G. antipoda*, and the origin of a *species nova*.

2. *G. subcorymbosa*,⁶¹⁹ sp. nov.

Shrub 3 ft.—4 ft. high, much branched, diffuse; branches (specimens) dichotomous, each 4 in.—6 in. long, and bearing 2—3 heads of flowers; branchlets spreading, slender, free, each with a head of flowers; bark red,

619 Possibly *Gaultheria rupestris* var. *subcorymbosa* (Colenso)
B.L.Burtt & A.W.Hill.

roughish, with a few coarse scattered appressed hairs. Leaves numerous, alternate, patent, petiolate, sub-coriaceous, glabrous, narrow-oblong-lanceolate, 9–11 lines long, closely serrate throughout, serratures and tip obtuse, green on both sides a little paler below; veinlets clear, pale, much reticulated, causing many small oblong and variously-shaped dots; petioles sub 1 line long, glabrous. Flowers terminal in spreading corymbose panicles 1 in. diameter, containing 20–25 flowers; peduncle, pedicel, calyx, corolla, and bracteoles all white; pedicels (and peduncle) finely and sparingly puberulent, 2½ lines long, curved, tribracteolate at the base; bracteoles clasping, imbricate, their margins finely serrulate. Calyx lobes large, acute, minutely serrulate-fimbriate. Corolla 2 lines long, sub-campanulate, inflated, mouth slightly contracted; lobes small, revolute, their tips obtuse and minutely denticulate. Filaments white, sub-lanceolate acuminate, 1-nerved, thickly and coarsely muricated, the tips of points obtuse; anthers dark orange-red, base gibbous slightly emarginate and minutely muricatulate; awns stout, spreading their sinus very broad, rising immediately from anther, with a small acute lobe on each side at base of awn. Style and stigma simple. Hypogynous scales broadly deltoid, concrete, their tips very obtuse, thickened, brown.

Hab. On eastern slopes of Ruahine Mountain-range, County of Waipawa: *Mr. H. Hill.*

Obs. A very graceful species, apparently distinct from all known ones; its anthers somewhat approach those of *G. oppositifolia*, Hook.f.

Genus 8. **Dracophyllum**, Lab.

1. *D. tenuicaulis*,⁶²⁰ sp. nov.

A small much-branched shrub. Branch (specimen received) 3 in. long, 2 lines diameter at base, naked; bark blackish-grey; bearing 15 small erect slender branchlets, each 1 in. – 1½ in. long, ½ – ¾ line wide, minutely and regularly scarred [477] with annular cicatrices from old leaves; red-brown, glossy. Leaves at tops of branchlets, 12–15 on each, close, erect, recurved, slightly spreading, subulate, ½ in. long, ½ line wide, canaliculate two-thirds of length, glabrous, shining, reddish; margins minutely serrulate; tips thickened, sub-terete, roughish, obtuse; the base largely dilated 2 lines wide, amplexicaul, closely imbricate; decreasing gradually in size upwards, the uppermost being only 4 lines long, the limb very short ½ – 1½ lines, with larger bases much overlapping, and their margins ciliate. Floral bracts orbicular, largely concave, margins finely ciliolate, 4 lines long, of which 2 lines form a long subulate thick obtuse mucro. Flowers terminal in small spikes of 3–7 flowers, closely compacted. Calyx, sepals small 1½ lines long, narrow linear acuminate; tips acute, margins membranous and finely ciliate. Corolla sub-campanulate or broadly tubular, 3½ lines long, sides straight, 5-cleft, lobes very small one-fifth length of corolla, triangular acute, margins crisped. Filaments very short, adnate above the middle. Anthers small, brown, oblong-cordate, 2-lobed; tip emarginate. Style short, stout; stigma slightly capitate, roughish, minutely jagged. Hypogynous scales sub-

620 *Dracophyllum recurvum* Hook.f.

quadrilateral, obsoletely striate, broadest at top, apical margin sinuate.

Hab. Arid stony ground, high up on Mount Ruapehu, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. A species having affinity with *D. recurvum*, Hook.f., and also with *D. rubrum*, Col.,⁶²¹ but differing from them in several characters.

2. *D. featonianum*,⁶²² sp. nov.

“A small bushy shrub, about 4 ft. high.” Leaves at tips of slender branchlets, 12–25, erect, loosely spreading, sub-rigid, 1½ in. long (2¼ in. at base of panicle), 2–2½ lines wide at base above vagina, suddenly and slightly contracted, linear acuminate gradually decreasing to tip, flattish, slightly concave above, glabrous, striate, membrano-coriaceous, dull-green; margins finely serrulate; tip thickened, sub-acute. Floral bracts, at the base of each branch (or branches when 2 together) of the panicle, orbicular, ½ in. long, largely concave; margins thin, minutely ciliolate (*sub lente*); tip mucronate, 2 lines long; within the bract, at the base of each pedicel, are very narrow curved subulate and setaceous bracteoles 1–2 lines long, their upper margins ciliolate; tips acute. Flowers terminal in a small narrow sub-compact panicle, 2 in. long, ½ in. wide, stems striate, glabrous, with a few thinly-scattered minute white hairs, almost microscopic; branches free, 3–4 lines long, largely bracteolate, alternate in pairs, each with [478] 3–4 flowers, and a very

621 WC: “Trans. N.Z. Inst.” vol. xx., p. 200.

622 *Stet.*

small broad apiculate persistent bracteole at base. Flowers small, reddish, pedicelled, spreading; pedicels very slender, 1 line long. Calyx half the length of corolla, sepals free, spreading, ovate, acute, ciliolate. Corolla 2 lines long, cylindrical or narrow campanulate, 5-lobed; lobes deltoid-ovate, obtuse, wrinkled, largely recurved, 1-nerved; margins and tips incurved. Filaments short, adnate above the middle of the tube; anthers small sub-orbicular cordate. Style rather long, longer than calyx, thickened below; stigma simple, scarcely capitate. Hypogynous scales very small, sub-oblong-rectangular, narrowed upwards, truncate, tip retuse. Capsules small, 5-cleft.

Hab. Whangaparaoa (Cape Runaway), a little north of the East Cape: 1889: per *Mrs. E. H. Featon*.

Obs. I. The floral leaves or bracts of this species can only be seen in the incipient state of its inflorescence, before expansion, as they all fall off very early. The preceding species, *D. tenuicaulis*, has also floral bracts very like these of this species, only they are much smaller and not so early deciduous. Writing from memory of 45–50 years, I believe I have often noticed a similar feature in the common northern species *D. urvilleanum*, A. Rich., and *D. lessonianum*, A. Rich. before flowering. And the same character has been fully noticed and described as pertaining to a large Tasmanian and Australian species—*D. milligani*, Hook.—by both Hooker (“Icon. Plant.”) and Bentham (“Flora Austral.”). And it is not unlikely that it belongs to other of our New Zealand species, though hitherto not described through their floral bracts falling off so very early.

II. I have named this species in honour of Mrs. E. H. Featon, of Gisborne, New Zealand—who has wrought so long and so diligently at our New Zealand botany—the accomplished authoress of “The Art Album of New Zealand Flora” (now in course of publication), who very kindly sent me the specimen I have described. In her letter which accompanied it she says, “The flowers are white and the buds pink, the leaves are a pale-green on top and glaucous below, having a purplish tinge as it approaches a buff-coloured sheath.”

Order XLIII. MYRSINEÆ.

Genus 1. Myrsine, Linn.

1. *M. brachyclada*,⁶²³ sp. nov.

A small somewhat rigid much-branched shrub; branches short, bark darkish red-brown, smooth; branchlets numerous, very short, scarred. Leaves sub-fascicled at tips of branchlets and at nodes, 4–5 together, spreading, obovate and oblong, 3–5 lines long, sub-membranaceous, glabrous, the upper [479] portion crenate, tips very obtuse crenulate with 2–3 notches, the lower margins towards petiole entire and slightly recurved, darkish-green and dull above, pale and reticulated below, the cuticle rather loose and wrinkled; petioles slender, slightly hairy and ciliate, 1 line long. Flowers sub-terminal, 3–4 together, axillary among leaves at tips of branchlets, 2 lines diameter, dark-brown; peduncles 1 line long, slender, drooping; bracteas at base, small,

623 Possibly *Aristotelia fruticosa* Hook.f.

brown, tips ciliate. Calyx-lobes 4, free, spreading, oblong, acute, 1-nerved, slightly pubescent, ciliolate at tips and margins. Corolla-lobes 5, cuneate, tips broad, irregularly notched or retuse, glabrous, sub 1 line long, twice the length of calyx, reticulately veined; veins dark, conspicuous, not reaching to margins. Anthers 4, large, ovate, pale, sub-cordate, tips acute. Stigma sessile, capitate, depressed, circular, irregularly 4-lobed, sunk in centre. Fruit not seen.

Hab. Sides of Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. This species varies much from the other known indigenous ones, especially in the form of its leaves and of its corolla; also, in it being the only known one whose leaves are without pellucid dots and entire margins; its corolla also is much larger, the lobes differently shaped and copiously veined, I have received two good specimens, evidently gathered from different shrubs (and probably at different elevations): in the one the leaves are small, scarcely 3 lines long, and the branches clothed with filamentous lichens (*Usnea* with apothecia); while the leaves of the other specimen are from 4 to 5 lines long: in all other respects, however, these two specimens are alike.

2. *M. neo-zealandensis*,⁶²⁴ sp. nov.

Shrub erect semi-fastigiate, 6 ft. high, slender, graceful, much branched; bark dark reddish-brown, smooth, striately wrinkled when dry; branches and branchlets long, sub-erect, slender, simple. Leaves few, distant,

624 *Myrsine montana* Hook.f.

alternate, solitary, obovate, 1 in.–1½ in. long, 5–6 lines broad, flat, membranous, glabrous, darkish-green above, pale below, margins entire with numerous intra-marginal pellucid red dots very close together; tip broadly rounded, sometimes (but rarely) slightly retuse; tapering to petiole; petiole slender, 1 line long; midrib prominent below; much veined, veins largely reticulate (*sub lente*). It also has a few solitary and scattered intervening very small leaves of 2–3 lines in length. Stipules linear, thickish, red; tips acute; slightly ciliolate at base.

Hab. Edge of a wood on open plain south of Dannevirke, County of Waipawa; 1889: W.C.

Obs. This is a pretty species, with a very striking [480] appearance, differing largely from all the other described New Zealand ones of this genus; as also from all others known to me; and, indeed, from all New Zealand shrubs and trees in general. Unfortunately, its flowers and fruit are still unknown; notwithstanding, I have no doubt of it being a species of *Myrsine*. I have only yet met with a single plant, although I have sought often and diligently for others.

Order XLVII. AROCYNEÆ.

Genus 1. Parsonsia, Br.

1. *P. ochracea*,⁶²⁵ sp. nov.

A bushy climbing shrub composed of many thickly-interwoven branches, rising to the height of 6 ft.–7 ft.;

625 *Parsonsia capsularis* var. *ochracea* (Colenso) Allan.

branches very long, slender, 1 line diameter, bark red-brown; branchlets very slender, almost wiry, short. Leaves opposite, distant, linear, 3 in.—4 in. long, 1 line wide, tips obtuse and sub-acute, glabrous, dark-green (drying olive-green), striate below, the lamina spreading at almost right-angles; petiole 1 line long, sub-vertical, with a small thick node at base. Flowers axillary, in small few-flowered graceful panicles, half as long as leaves (sometimes in larger open airy leafy panicles), usually 3- or 5-flowered; peduncles very slender, $\frac{1}{2}$ in. long, puberulent (as also pedicels and lobes of calyx); pedicels filiform, opposite, 4 lines long, bracteolate at base; bracteoles linear, narrow, 1 line long, spreading; tips thickly ciliate. Calyx dark-green, nearly as long as tube of corolla; lobes long, narrow, obtuse, tumid at base, margins membranous, ciliate; hypogynous scales conical glabrous obtuse. Corolla sub-campanulate, 3 lines long, ochraceous; lobes twice the length of tube, sub-oblong-spathulate, tip sub-acute, dimidiate excised on one side near the tip, slightly revolute, veined; largely overlapping in the bud. Anthers half exserted, sagittate, narrow, acute, with long divergent tails as long as anthers. Stigma capitate, semi-elliptic (glans form), constricted near base, base truncate. Pod sub-terete, acuminate, 6 in. long, $\frac{1}{10}$ in. wide, slightly puberulent, tip obtuse.

Hab. Edges of dry woods, south of Dannevirke, County of Waipawa; 1888: W.C. (Flowering in December.)

Obs. I. This plant has caused me a deal of close study and examination; partly owing to the great variableness in our species of this genus, and partly to Sir J.D. Hooker having reduced his original four species in the "Flora

N.Z." to two species in his later work, "Handbook of the N.Z. Flora," with the remark, "I am convinced there are but two species of this genus in New Zealand" (*loc. cit.*, p. 187). To this, however, I cannot subscribe. [481]

II. I have already described another species, *P. macrocarpa* ("Trans. N.Z. Inst.", vol. xiv., p. 331), and this present plant I also believe to be a valid species, or, at least, a well-marked and distinct variety. It differs considerably from the two well-known species in the "Handbook," *P. albiflora* and *P. rosea*; not merely in the remarkable and constant form and size of its leaves, but also in its much larger flowers of a different shape and colour, as well as in other characters (*vide* descript.).

III. I was much struck with the peculiar appearance and graceful beauty of the plant when I first saw it; though then (in May) it was not in flower, only in fruit; and it was through my going purposely to those farther forests in the following summer that I was rewarded by finding it in flower. It is certainly an elegant garden plant. In general, in the two other and commoner species (named above) the leaves vary materially on the same plant, even on the same branch; but such is not the case with this one.

Order LVIII. PLANTAGINEÆ.

Genus 1. Plantago, Linn.

1. *P. picta*,⁶²⁶ sp. nov.

Plant perennial, sub-rosulate, flat, appressed to ground, sub 3 in. diameter; rootstock very stout and densely hairy; hairs rather long, red-brown, shining. Leaves sub 30, spreading, narrow-oblong-spathulate, 1 in.–1¼ in. long, 4 lines broad at middle, sub-coriaceous, opaque, veined, veins obsolete, margins entire with 3 distant narrow patent teeth (or sub-lobes) at middle on each side, glabrous with a few scattered weak hairs on the upper surface and forming small tufts at bases of teeth, and sub-ciliate at margins; tip subacute; petiole very broad, 2 lines wide, flat, 7-nerved, densely hairy at extreme base; hairs long, reddish-brown. Scapes 8–10 to a plant, 1½ in.–1¾ in. long, extending beyond leaves, slightly hairy (more so at top); hairs flattish, adpressed, white, articulate. Spike broadly- or deltoid-elliptic, obtuse, 5 lines long, sub-truncate and 4 lines wide at base, slightly compressed, 8–9-flowered, the lowest pair free, subsessile. Bracts large, broadly ovate, dark brownish-black with broad white membranous and ciliate margins, much veined, veins branching, hairy within at base between bract and calyx. Calyx-sepals (4) much the same as bracts, only narrower. Corolla large for plant, very membranous, lobes spreading, white with a dark longitudinal centre, broadly ovate, margins entire and not involute; tip obtuse, mucronulate, and minutely toothed on each side. Anthers exserted, ochraceous, large, 1 line long, ovate-cordate, the centre deeply sulcate; their basal

[482] extremities rounded; tip produced, apiculate. Style much exserted, thickened upwards, coarsely hairy

Hab. On a small islet lying near the shore between Gable-end Foreland and Tolaga Bay; 1889: *Mr. H. Hill.*

Obs. This plant differs considerably from our other known New Zealand species. Its nearest ally seems to be *P. brownii*, Rapin; but on closely comparing it with the drawings and ample dissections of that species as given by Sir J.D. Hooker in his "Flora Antarctica," vol. i., tab. 43, it is found to possess several grave differential characters—*e.g.*, in its leaves being thinner and much more veined, and bearing tufts of jointed hairs on their upper surfaces, and very hairy at their bases; in the larger number of flowers in its spikes; in its bract and calyx-lobes having wide membranous white borders, with ciliated margins; in the long hairs between the bract and calyx; in the lobes of the corolla being broader, flat, and obtuse; in its anthers being of a different shape—the tip more acuminate, and their basal extremities broadly rounded, not acutely pointed.

Order LXIII. POLYGONEÆ.

Genus 2. *Muhlenbeckia*, Meisn.

1. *M. muricatula*,⁶²⁷ sp. nov.

A small low prostrate wiry undershrub. Branches implexed, long, very slender, striate, roughish; bark dark-

627 *Muehlenbeckia axillaris* (Hook.f.) Walp. x *M. ephedroides* Hook f.

brown; branchlets few, almost filiform, alternate, striate, sub-angular, finely and thickly muricated. Leaves few, alternate, scattered, 4–5 lines distant, linear, 4–5 lines long, $\frac{1}{30}$ in. broad (sometimes smaller), thickish, no veins visible, dull darkish-green, shining, tips sub-acute, margins entire; midrib stoutish below; petioles tapering insensibly, thickish, sulcated, minutely muricated, and so midrib below; stipules large, brown, scarious, truncate, veins conspicuous. Flowers hermaphrodite, axillary, 2 together, sub 8–10 pairs, alternate, distant 3–4 lines apart in a terminal leafy raceme, their leaves small and decreasing in size to tip, sometimes without leaves and only stipules, which are large and bladdery, the middle vein of the outer one stout, aristate. Perianth white, $1\frac{1}{2}$ lines diameter, 5-lobed, lobes oblong, 1-nerved, tips obtuse; peduncle 1 line long, white as perianth; style 3-branched, stigmas thick, each 3-branched. Anthers broadly elliptic, nearly sub-orbicular. Nut black, half exserted, $1\frac{1}{2}$ lines long, smooth, shining, broadly ovoid-lanceolate, triquetrous, angles obtuse; the perianth-lobes persistent, membranous.

Hab. Summit of Mount Ruapehu, and within the old crater, on dry stony spots, County of East Taupo; 1889:
Mr. H. Hill. [483]

Order LXVII. THYMELEÆ.

Genus 1. Pimelea, Banks and Solander.

1. *P. lanceolata*,⁶²⁸ sp. nov.

Shrub erect, "3 ft. high," much branched at top; glabrous except inflorescence. Branches regularly tubercled with scars from former leaves; bark reddish-brown, shrivelled; branchlets opposite and sub-fasciculate, numerous, spreading, sub-angular; bark light yellow-green. Leaves lanceolate, usually 2 in. long, $3\frac{1}{2}$ lines wide at middle (sometimes smaller), opposite, distant 3–4 lines apart, spreading, flat, light-green, midrib prominent below, principal veins very long almost obsolete, margins slightly recurved, tips acuminate, thickish, acute, somewhat suddenly contracted at base, petiole 2 lines long, with a minute tuft of erect hairy bracteoles in the axils; the floral leaves similar but shorter and a little broader. Flowers in small terminal corymbose heads, 8–15, peduncled; peduncles short, very hairy with coarse grey hairs. Perianth 8 lines long, white, rather thin, strigosely hairy throughout; hairs white, very thick and coarse at base; tube infundibuliform, throat wide, very narrow below, constricted near base; limb spreading, lobes broadly elliptic very obtuse rounded, each 2 lines long, margins slightly irregular, much and reticulately veined, veins red. Anthers large, oblong, slightly apiculate, adnate, 1 line long; stamens and style much exserted. Nut narrow ovoid, enclosed in membranous base of perianth.

Hab. Base of Mount Ruapehu, County of East Taupo; 1889: *Mr. H. Hill.*

628 *Pimelea x angulata* Colenso.

Obs. Its nearest ally among the known species of *Pimelea* is *P. longifolia*, Banks; differing, however, from that species in several characters, especially from the more minute and exact specific description of it as given by Bentham, "Flora Australiensis," vol. vi., p. 6.

2. *P. similis*,⁶²⁹ sp. nov.

Shrub erect, 2 ft.–3 ft. high; branched at top; glabrous except inflorescence. Branches spreading; bark dark-red, wrinkled, smooth; branchlets numerous, slender, very pale straw-colour, sub-angular. Leaves broadly lanceolate, 1 in.–1½ in. long, 5–6 lines broad, tips suddenly acuminate, obtuse, opposite, sub-decussate; fewer larger and more distant on branches, numerous and smaller on branchlets, flat, dull olive-green, upper surface cuticle smooth shining wrinkled, veined; midrib below stout and prominent; margins thickened sub-cartilaginous, white, recurved; petioles stoutish, short, 1 line long, somewhat broad and flat, pale-yellowish like branchlets; involucral leaves similar but broader, ovate-lanceolate abruptly acuminate. [484] Flowers in small terminal heads, 6–9, half hidden among the leaves, peduncled; peduncles short, sub 1 line long, curved, densely hairy or sub-silky, whitish, shining. Perianth ½ in. long, brownish-red with grey hairs, very hairy about limb, hairs extending far beyond tips of lobes, scattered below; limb sub-erect not spreading; lobes narrow oblong, sub-acute, 1½ lines long, margins incurved, veins simple not reticulated; tube cylindrical, very slender throughout; throat narrow. Anthers scarcely half-

exserted, very small, elliptic, about $\frac{1}{2}$ line long; style exserted as long as perianth; stigma small, capitate, papillose. Nut ovoid, larger than in the preceding species, enclosed in membranous base of perianth.

Hab. Edges of thickets, base of Mount Ruapehu, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. A species very closely allied to the preceding (*P. lanceolata*), so that it might easily be taken for it at first sight, and yet differing from it in many particulars. The principal differences are to be found in its shorter yet broader dull-green leaves, with thickened white margins; its much smaller and slenderer perianths, which are of a different colour, with their lobes narrower, acute, incurved, and not largely veined; and its very small half-included and differently-shaped anthers.

3. *P. microphylla*,⁶³⁰ sp. nov.

Plant small, shrubby, sub-prostrate, and compact; branches 3 in.–4 in. long, bark greyish-black, regularly scarred (also branchlets) from cicatrices of fallen old leaves; branchlets numerous, short, with greyish hairs between leaves. Leaves only at tips of branchlets for about $\frac{1}{2}$ in., quadrifariously disposed, regular, closely imbricate and appressed, elliptic, $\frac{1}{10}$ in. long (sometimes smaller), margined, obtuse, concave, sessile, thickish, veins not visible, glabrous, yellowish-green; the floral leaves scarcely larger, but with a few fine ciliolate white hairs at tips. Flowers few, sub-terminal, solitary and 2 near each other, small, $1\frac{1}{2}$ lines long, slightly hairy on the outside, brownish-red (when dried); tube as long as

630 Possibly *Pimelea prostrata* (J.R.Forst. & G.Forst.) Willd.

lobes; lobes oblong, veined; tips very obtuse. Anthers exserted; style as long as lobes.

Hab. Sides of Mount Tongariro, County of East Taupo 1889: *Mr. H. Hill.*

Obs. A very peculiar and pretty little species, apparently allied (though not closely) to *P. guidia* and to *P. buxifolia*; differing from them both in its very small and closely-imbricated quadrifarious leaves, its solitary red flowers, and the rounded tips of its perianth-lobes. I have received several small specimens, which are all alike as to leaves, &c., but containing very few flowers. [485]

4. *P. bicolor*,⁶³¹ sp. nov.

A small shrub, main branches 2 in.–3 in. long, slender, erect; branches leafy, hairy, bark dark-red; branchlets 1 in.–2 in. long, very slender. Leaves numerous, lanceolate, 2–2½ lines long, concave, thickish, pale-green, glabrous, margined with a broad dark-purple line, extending on both surfaces, which is also constant, sub-sessile, decurrent, sub-imbricate on main branches, distant 2 lines apart in opposite pairs on young branchlets; petioles yellowish-brown; floral leaves similar but slightly larger. Flowers very small, sub-terminal, axillary, single or forming an opposite pair. Perianth 2 lines long, with a thick tuft of greyish-white hairs at base, urceolate, membranous, veined, reddish (when dry), very hairy; hairs long, straight, coarse, white, extending beyond tips of lobes; lobes very small, shorter than tube, broadly

631 *Stet.*

elliptic, obtuse; style exserted; stigma large, capitate, fimbriate. Nut enclosed, oblong, turgid, 1 line long.

Hab. Open spots, Taupo, County of East Taupo; 1889;
Mr. H. Hill.

Obs. A species allied to *P. urvilleana*, A. Rich., and to *P. prostrata*, Vahl; also to *P. rugulosa*, Col. ("Trans. N.Z. Inst.", vol. xxi., p. 102).

5. *P. dichotoma*,⁶³² sp. nov.

Shrub 2 ft.–4 ft. high, much branched; branches long, erect, very slender, regularly ringed with scars from old leaves; bark light reddish-brown, glabrous; branchlets in pairs, leafy at top, the young branchlets very hairy; hairs long, white, strigose, appressed. Leaves decussate, distant, sessile, linear, $\frac{1}{2}$ in. long, 1 line wide, recurved falcate, green somewhat obscure; tips and bases red; base a thickened knob; glabrous above, strigosely hairy below (as also floral leaves); hairs white, springing from coloured sub-muricated dots, and extending beyond tips in small pencils; floral leaves (usually 4) much larger and thinner, ovate-lanceolate, $\frac{3}{4}$ in. long, 3 lines wide, sub-sessile, light-green; veined. Flowers terminal (at first, afterward axillary between branchlets), in small heads usually 8–9, sessile; perianth very hairy on the outside, 3 lines long, tube narrow, reddish and swelling below; lobes 1 line long, sub-oblong-ovate, very obtuse, veined, slightly spreading, white, much ciliate; throat red; anthers included; stigma slightly exserted, globular, minutely and densely pencilled.

632 Possibly *Pimelea tomentosa* (J.R.Forst. & G.Forst.) Druce.

Hab. Banks of streamlets, borders of open plains,
Tahoraiti, County of Waipawa; 1889: W.C.

Obs. An extremely neat-growing open shrub, of graceful appearance when in flower (in October). A peculiar character is that of its young branchlets, which spring in opposite pairs from within the floral leaves, and grow very rapidly; so that, [486] while its heads of flowers are terminal on their first expanding, they soon become axillary between two long branchlets, which, on the flowers withering and falling off, become equally forked with a broad obtuse basal angle.

6. *P. heterophylla*,⁶³³ sp. nov.

Shrub small, erect; branches (specimens) 3 in.—4 in. long, slender, 1 line diameter, much branched at top; bark dark-coloured, slightly pubescent; branchlets erect, 1 in.—2 in. long, very slender, scarcely $\frac{1}{3}$ line in diameter; young branchlets red, glabrous, with a few scattered short appressed hairs. Leaves glabrous, slightly concave, decussate, petiolate, of 2 sizes and forms—(1) 2 lines long, broadly lanceolate, distant 1 line apart, free and spreading on flowering branches; and (2) 1 line long, narrow lanceolate, very close, crowded and imbricated on the smaller (and barren) branchlets; all narrowly margined red; petioles red, glabrous. Floral leaves similar to No. 1. Flowers terminal and sub-terminal, 2—4 together, small, their tips only appearing among the leaves. Perianth red, veined, very hairy; hairs white; tube $1\frac{1}{2}$ lines long; lobes (sometimes only 3) $\frac{1}{2}$ line long,

633 *Pimelea prostrata* (J.R.Forst. & G.Forst.) Willd.

rounded. Anthers enclosed. Style much exserted; stigma large, capitate. Nut enclosed, obovate, large (for plant) 1½ lines long, dark-green.

Hab. Dry open spots, high up on Mount Ruapehu, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. A species pretty closely allied to *P. bicolor*, Col. (*supra*), and difficult in words clearly to describe their differences (which, indeed, I have had some labour in doing); yet, when the specimens are compared and examined together, their variance is apparent at once. I would, however, that I had received more and better specimens of both plants, and also of all specimens of *Pimelea* brought from the mountainous interior.

7. *P. polycephala*,⁶³⁴ sp. nov.

Plant (apparently) a very small low densely-compacted shrub. Branches (specimens) small, stems thickish 1 in.—2 in. high, the lower portion naked; bark dark-coloured; with many very small branchlets at top, ½ in.—¾ in. long, closely and regularly tubercled in ridges from old fallen leaves; scars glabrous; stems hairy between them; hairs coarse, of unequal lengths, dirty-white. Leaves thickish, densely imbricated, small, sub-rhombic-orbicular, 1—1½ lines diameter, base truncate, sessile, glabrous, yellowish-green; the lower ones keeled; those near the tops more orbicular, a little larger, and obsoletely veined. Involucral leaves in 3 rows, 3 in a row alternating, larger, sub-orbicular, tapering slightly to [487] petiole, very

634 *Pimelea prostrata* (J.R.Forst. & G.Forst.) Willd.

membranous, reddish, much-veined, veins forked and coloured a deeper red, largely hairy on the whole of the under-surface; hairs white. Flowers not seen (? too early in the season); but the floral leaves are clustered in several small heads (the size of a large pea) at the tips of branchlets, each head on a short stout stem 2–3 lines long, comprising 5–8 smaller heads on short pedicels, and each of these smaller heads contains the larger and hairy involucral leaves, more or less crumpled up: the whole most closely packed.

Hab. Near the summit of Mount Ruapehu, in dry stony ground, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. Not having received any flowering specimens of this peculiar and very distinct species, I should not have cared to describe it were it not for its striking abnormal floral leaves, which, being so widely different from its own proper leaves in appearance, size, texture, venation, and colour, present the *primá facié* aspect of a corolla; and this is still further increased through these leaves being so greatly wrinkled and congested, and also very hairy on their outside. Moreover, this peculiar character in the floral leaves is one that hitherto has scarcely been found to pertain to the New Zealand species of *Pimelea*, although it is a common feature to several of the numerous Australian species of this genus. Bentham, in his "Flora Australiensis," describes 67 species, besides several strongly-marked varieties—species with other botanists.

Genus 2. *Drapetes*, Lamarck.

1. *D. macrantha*,⁶³⁵ sp. nov.

Plant small, prostrate, scarcely semi-shrubby; branches 3 in.—4 in. long, slender, brown, scarred; branchlets subsecund, erect, regular, 1 in. high, 1 line wide, simple, green, leafy throughout. Leaves closely appressed imbricate, linear-linguiform, obtuse, 1 line long, sessile, glabrous, striate, gradually increasing in length upwards on branchlets, the uppermost leaves larger, more acute, their apical margins sparingly ciliate, tips bearded.

Flowers terminal at tips of branchlets, 3—4 together, free above leaves, white, conspicuous. Perianth sub-narrow campanulate, 2 lines long, lamina nearly 2 lines wide, sessile, with a ring of hairs around base but separate; tube strongly 8-nerved, glabrous, shining; lobes sub-elliptic, two-fifths length of perianth, 1-nerved, puberulous at the centre on the outside, their tips very slightly ciliate, each with two small sub-rotund yellowish scales at base.

Filaments exserted, long, half the length of lobes; anthers sub-orbicular, yellow.

Hab. On the eastern slopes of Ruahine Mountain-range, County of Waipawa: *Mr. H. Hill.* [488]

Obs. A species very unlike in habit and general appearance those two described indigenous ones—*D. dieffenbachii* and *D. lyelli*, Hook.f.—also, those other three species (forming the genus) of Tasmania, Fuegia, and Borneo; being smaller, neater and simple-branched, with larger and more numerous flowers.

635 *Kelleria dieffenbachii* (Hook.) Endl.

CLASS II. MONOCOTYLEDONS.**Order I. ORCHIDEÆ.****Genus 3. *Bolbophyllum*, Thouars.****1. *B. tuberculatum*,⁶³⁶ Col.**

Bulb ovoid, dark-green, glossy, clothed with minute white shining lepros circular bullate scales. Peduncle sub 1 in. long, slender, with 3 sheathing caudine bracts, equidistant, membranaceous, pale, striate, 3-flowered. Flowers small, usually 3 (sometimes by abortion only 2), rather distant, on short pedicels, each with a sheathing bracteole at its base. Perianth triangular, very oblique, gibbous at base (as in young *Dendrobium cunninghamii*), whitish, very membranous; sepals of nearly equal length, their tips and upper margins of a violet tinge, slightly open, when fully expanded 2½ lines broad; dorsal sepal narrow, ovate, 1-nerved; the lateral pair much broader, triangular-ovate, dimidiate, 3-nerved, sub-acute, connate in front under joint of labellum; petals white, ovate, obtuse, 1-nerved, ½ size (or less) of sepals; labellum exserted, sometimes the lamina is erect and falls back on the column, 1 line long, sub-ovate-oblong, tip sub-acute, thickish, smooth, margin entire, bright vermilion-red with a central yellow line running to base, base truncate with 2 small longitudinal ridges at posterior part, its margins thin incurved, claw slender very long (nearly as long as lamina), yellowish, the joint excessively mobile. Column minute, lateral appendages sub-triangular, hyaline, their tips retuse, with a minute glossy gland at base in front;

636 *Adelopetalum tuberculatum* (Col.) D.L. Jones, M.A. Clem. & Molloy.

anther pale-yellow, tip circular, slightly erose. Capsule oblong, turgid, 3 lines long, striate; striae light-red.

Leaves, &c., as already described, only some are larger 9–12 lines long and purple below; veins (in fresh state) not visible. Ovary and peduncle tuberculated as described. ("Trans. N.Z. Inst.," vol. xvi., p. 336.)

Hab. Epiphytal on trees, forming pretty large and closely-matted masses, woods near Palmerston, County of Manawatu; April, 1889: *Mr. A. Hamilton.*

Genus 12. *Pterostylis*, Br.

1. *Pt. speciosa*,⁶³⁷ sp. nov.

Plant stoutish, erect, 9 in.–10 in. high; stem and leaves of a reddish hue. Leaves: basal 0, but 2–4 small ovate pale [489] scales, distant on lower stem; caudine 4, nearly equidistant, much longer than flower, 5 in.–8 in. long, $\frac{3}{4}$ in. broad at middle, linear-lanceolate, acute very thin, sessile, clasping, much and reticulately veined, light-green. Perianth large sub 2 in.; segments rather loosely spreading, richly variegated with bright-red dark-green and fawn colours, the upper portions of segments brilliant red; largely veined; veins very prominent. Dorsal sepal large, acuminate, slightly tailed; lateral sepals connate, erect, largely spreading above and behind dorsal, tails long; sinus very broad, base emarginate; lateral petals loose from dorsal sepal, their tips very acute, not tailed; tongue linear-lanceolate, 2 lines wide, veined, reddish, minutely and thickly papillose; tip obtuse, thickish and slightly knobbed; appendage long, curved, fimbriate. Column long, wings broad, auricles long wide rounded,

637 *Pterostylis banksii* A.Cunn.

two subulate horns arising from outer angles shorter than the column, the margin between them slightly erose; stigma large, wider than column.

Hab. Near Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

2. *Pt. auriculata*,⁶³⁸ sp. nov.

Plant erect, glabrous, shining, 10 in.–12 in. high; stems bright-red. Leaves: basal 0; caudine 4, lanceolate very acuminate, 5 in.–7 in. long, $\frac{1}{2}$ in. wide, sheathing at base, pale-green, midrib reddish. Perianth 1½ in. long, narrow, graceful, green with a reddish tint. Dorsal sepal and lateral petals narrow, sub-ovate, sharply acuminate, not tailed; lateral sepals erect, connate, sinus large, lobes narrow, long, spreading, tailed—tails nearly 1 in. long; tongue dark-red, linear-oblong, sub 1 in. long, 2 lines wide, middle nerve stout, flexuous, with 4 flexuous longitudinal veins on each side, the tip truncate and slightly bifid; appendage wide, shortly curved, coarsely fimbriate. Column long, slender, wings produced upwards in subulate tips nearly 1 line long, with very long and narrow auricles 2½ lines long, their tips closely and finely fringed. Ovary slender, somewhat linear, 1 in. long, reddish.

Hab. Open fern land, Fortrose, Invercargill; 1889.

3. *Pt. polypylla*,⁶³⁹ sp. nov.

Plant light-green, very slender, erect, 7 in.–9 in. high. Leaves very membranous, veined, reticulations large

638 *Stet.*

639 *Pterostylis micromega* Hook.f.

somewhat in squares; basal 6–7, forming a sub-rosette, oblong and oblongovate, 1 in. long, petioled; petioles tapering, membranous, $\frac{1}{2}$ in. long; caudine 6–7, sub-erect, narrow oblong or obovate, $\frac{3}{4}$ in.– $\frac{1}{2}$ in. long, equidistant on stem, the lower petiolate; petioles long, $\frac{3}{4}$ in.; the upper sessile, sheathing at base. Perianth pale-green, $1\frac{1}{2}$ in. long, rather narrow, very membranous, [490] slightly veined, segments not tailed. Dorsal sepal slightly acuminate, acute; lateral sepals connate, erect, acuminate, longer than dorsal; lateral petals nearly as long as dorsal sepal, acuminate, tips obtuse; tongue sub-linear-lanceolate, thickish, no veins visible, brownish-green, glabrous, produced, slightly recurved, tip sub-acute; appendage small, very short, slightly recurved, with a few short fimbriæ. Column rather short, length of tongue; wings broadly auricled, with two stoutish subulate acuminate horns arising from centre of wings and longer than column; stigma fimbriate at base.

Hab. Near Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

Genus 15. *Thelymitra*, Forst.

1. *T. fimbriata*,⁶⁴⁰ sp. nov.

Plant rather slender, stem 11 in. high, erect, flexuous. Leaves: basal 0; caudine 1, 3 in. from base, sheathing, linear-acuminate, sub-acute, $6\frac{1}{2}$ in. long, $\frac{1}{2}$ in. wide at base, flat, sub-coriaceous, dark-coloured (with stem and bracts) when dry. Two large caudine bracts, equidistant, nerved, their tips very acuminate much produced and flexuous. Flowers 5, distant in a loose raceme, their

640 *Thelymitra pulchella* Hook.f.

pedicels $\frac{1}{2}$ in. long (the length of ovary); floral bract broadly ovate (almost sub-orbicular), 8–9 lines long, 5 lines wide, many-nerved, the top suddenly acuminate, acute. Perianth $1\frac{1}{4}$ in. diameter, violet with darker pencillings, much veined; veins branching. Dorsal sepal broad; petals narrower than lateral sepals; lip longer and very narrow. Column truncate, with small toothed wings shorter than staminodia; staminodia largely fimbriate; fimbriæ spreading, irregular, flat, flexuous, sometimes forked at their extreme tips; anther ovate, pointed.

Hab. Open fern lands, interior; also in similar situations, Fortrose, Invercargill, whence specimen received in a packet: 1888.

Obs. A species having affinity with *T. pulchella*, Hook.f., but differing in its larger and otherwise-coloured flowers, its long narrow labellum, and remarkably fimbriate staminodia, &c.

Genus 18. Orthoceras, Br.

1. *O. caput-serpentis*,⁶⁴¹ sp. nov.

Plant erect; root 2 large narrow-oblong tubers, 2 in. long, sub-terete; stem slender, 18 in. long, 1 line diameter above, green, rigid, wiry; 1 short broad basal bract, $\frac{3}{4}$ in. long, acuminate. Leaves 2, near base, sheathing, 9 in. long, very narrow, sub 1 line wide, sub-terete throughout, deeply channelled, margins closely involute, tip acute; 3 caudine leaves much shorter, distant, appressed. Flowers few (5), distant; [491] raceme short, 3 in. long; pedicels

641 *Orthoceras novae-zeelandiae* (A.Rich.) M.A. Clem., D.L. Jones & Molloy.

4–5 lines long, each with a green bract at base 1 in. long, broadly ovate, $\frac{1}{2}$ in. wide near the base, much and suddenly acuminate, shorter than flower. Perianth open, gaping, sub-labiate; dorsal sepal concave, flattish, sub-orbicular, 5 lines diameter, shining, green without red-purple within towards base, obsoletely veined longitudinally, margins entire, thin, slightly incurved; lateral sepals 10 lines long, spreading, divergent at nearly right angles (*not upright*), thickish, narrow, wiry, 1 line wide at base, deeply channelled, margins conniving, purple-spotted, tip sub-acute; petals sub-oblong-ovate, 3 lines long, 2 lines broad at base, purplish, tips truncate, 3-toothed, sides not excised. Lip dark purple-red with a central bright-yellow longitudinal line, glabrous, 4 lines long, 3 lines broad at base, 3-lobed, lobes deeply cut, the 2 lateral erect, produced, sub-triangular-ovate dimidiate, obtuse, margins entire, thickened; the apical lobe much recurved, its tip rounded thickened and slightly concave, and a large rounded yellow callus at base its tip recurved, a minute colourless gland arising from base of labellum under the tip of the large yellow callus, no claw. Column green, acuminate, with thin yellow margins, the 2 appendages sub-linear, longer than column, curved, subulate, papillose, tips acuminate, acute. Anther broadly ovate, acuminate. Stigma large and with rostellum sub-quadratae-orbicular, much broader than anther. Ovary 8 lines long, narrow-oblong-clavate, slightly ribbed, ribs very obtuse; grass-green.

Hab. Open ground near River Moawhango, County of East Taupo; 1889: *Mr. H. Hill.*

Order X. RESTIACEÆ.

Genus 3. Gaimardia, Gaud.

1. *G. minima*,⁶⁴² sp. nov.

A small glabrous and pale plant, main branch or root-stock horizontal, creeping under ground, stoutish, rooting and tufted from nodes, tufts pretty close; stems erect, sheathing; sheaths numerous, short, broadly ovate, striate, imbricate, appressed, tips thickened obtuse.

Leaves 4–6 to each tuft, about $\frac{1}{2}$ in. long, $\frac{1}{50}$ in. broad, erect and spreading, recurved longitudinally from vagina, wiry, somewhat harsh, sub-terete; tips sub-truncate, rounded; vagina broad, clasping, shining, striate, margins entire; ligula small, scarcely angled, minutely ciliolate; light-green when young. Peduncle terminal to tuft or branchlet, as long as the leaves, stoutish, striate. Capsule lanceolate, slightly convex on both sides, sub 2 lines long, smooth, shining, crustaceous, yellowish-ochraceous (somewhat resembling a small grain of *Phalaris canariensis*), tip obtuse, notched; stigmas 2, linear, $\frac{1}{10}$ in. long, shaggy. [492]

Hab. Dry open grounds, Mount Tongariro; 1889: *Mr. H. Hill.* Also, on high stony plains south of Dannevirke, County of Waipawa, hidden among low herbage; 1888: *W.C.*

Obs. I. A very small plant of densely-matted intricate flat growth, with only the upper portions of its tiny tufts and fruits appearing above soil. It seems pretty closely allied to the few (3) known and scattered species of this genus,

642 *Zoysia minima* (Colenso) Zотов.

though differing from them all: one (*G. setacea*) found at Port Preservation, South Island, by Lyall; one (*G. ciliata*) in Lord Auckland's Islands, by Hooker; and one (*G. australis*) in the Falklands, by Gaudichaud—this last-named species is also in Fuegia.

II. I have obtained several specimens from the matted lump of turf or sod containing them, cut out of the soil by Mr. Hill; but all the fruits were old or imperfect save two, which had retained their stigmata but no anthers.

Order XI. CYPERACEÆ

Genus 12. *Oreobolus*, Br.

1. *O. serrulata*,⁶⁴³ sp. nov.

Plant very small, densely cæspitose in close tufts, 1½ in. high, erect, much and closely branched. Leaves subulate, 1 in. long, erect, canaliculate, striate, sub-equitant, tips obtuse, margins throughout minutely and closely serrulate; pale-green when young, reddish in age; vagina very large, 2 lines wide, membranous, white, shining, its tips rounded produced and finely serrulate, 2-nerved on each side, nerves conspicuous, red; ligula 0. Culm shorter than leaves, cylindrical, smooth, wiry. Glumes 3, the outer and uppermost largest, its apical margin finely serrulate; the 2 floral ones margins entire, their tips obtuse slightly lacerate. Stamens 2 (in two flowers examined), long, flexuous, longer than style. Style long, filiform, straight, black, smooth; stigmatic branches 3, very long and flexuous, scabrid throughout, brown, not

643 *Oreobolus pectinatus* Hook.f.

starting from one point. Scales 6, narrow triangular, acuminate, erect, persistent, white, their margins closely and finely serrulate. Nut small, under 1 line diameter, broadly pear-shaped, white.

Hab. Swampy ground at Rangipo, near the eastern base of Mount Tongariro, County of East Taupo; 1889: *Mr. H. Hill.*

Obs. This is an interesting little plant, making the third species of this small and curious genus found in New Zealand, which genus only now contains 4 species. It is also the smallest of them all, and is very distinct as a species in its finely-serrulate margins. One species (and the original type of the genus), *O. pumilio*, Br., was first detected by its describer in Tasmania; this species was also found by Sir J.D. Hooker in the Antarctic Islets, who at first described it as a sp. nov. [493] *O. pectinatus*; and afterwards it was found by myself at Taupo and on the open summits of the Ruahine Mountain-range. A second New Zealand species, *O. strictus*, Berggren, was discovered by him near the River Bealey, South Island, and fully described, with admirable drawings and dissections, in his book of "New Species of New Zealand Phænogamous Plants," 1877. Another species, *O. obtusangulus*, Gaud., was early discovered by him in the Falkland Islands. Small though they all are, and in many respects very much alike, yet they all possess good distinctive characters; their study has afforded me great pleasure.

1890 The first European fighting at Taranaki. In Sherrin AA. *The Early history of New Zealand: part 1 of Brett's Historical Series: Early New Zealand*. Auckland, pp. 435-458.⁶⁴⁴

The Alligator left New Zealand on the 31st March, 1834, but returned again early in September the same year. The cause of her second visit was in consequence of an application, dated 23rd August, from the Governor in Council, to Captain Lambert requesting him to proceed with his vessel to obtain the restoration of certain British subjects then in the hands of Ngatiruanui—nine sailors, one woman, and two children—who had formed part of the crew and passengers of the barque Harriet, shipwrecked near Cape Egmont on the 29th April, 1834. On the 31st August the Alligator, having on board Lieutenant Gunton and a detachment of the 50th Regiment, made sail from Port Jackson, in company with the Isabella, colonial schooner, on board of which Captain Johnson of the same regiment and another detachment of soldiers were embarked to co-operate with Captain Lambert.

The circumstances attending this melancholy affair have been carefully collated by Mr. W. Colenso, and as it formed the first European fighting and killing at Taranaki, which unhappily has since been the scene of so much that is painful in New Zealand history, it may be set out at length.

⁶⁴⁴ This is reproduced from a series of articles published by the "Waipawa Mail" between 22 January and 5 March 1881. Much of the narrative is simply quoted by Colenso from Dr Marshall's account – but it is included here in full because of Colenso's clear sympathy with Marshall's humanitarian sentiments.

Mr. Colenso says "Perhaps I should in the first place briefly state how I happened to know so much about it, that old affair, viz., the loss of the Harriet barque at Te Waimate, south of Cape Egmont, and the bitter revenge which so quickly followed. I was at Sydney, New South Wales, at the time, waiting for a vessel to bring me to New Zealand. While there I had made the acquaintance of Dr. Marshall, the surgeon on board H.M.S. Alligator, on her return thither from that expedition, and had received from him the whole sad account while fresh. Besides, I have it now as fully written (daily journal fashion) by Dr. Marshall, who was a truly Christian gentleman. I have also Guard's statement, official documents, made before the Executive Council at Sydney. And lastly, on my subsequently coming to New Zealand Guard himself was a fellow-passenger, and a most unpleasant one, during a long voyage in our wretched, little, and badly-formed craft.

"My tale I shall divide into two parts, the first being the relation by Captain Guard of his shipwreck, abstracted from his depositions before the Executive Council at Sydney, etc., this being necessary to understand what followed; the second being extracts from Dr. Marshall's clear and circumstantial account of all matters attending the subsequent rescue of the captives. The whole is very interesting, and would form a book of a hundred pages.

"Extract from the examinations of Mr. John Guard, master of the barque Harriet, before the Executive Council, Sydney, New South Wales:—

"In proceeding from Port Jackson to Cloudy Bay, New Zealand, the Harriet was wrecked on the 29th of April

last, near Cape Egmont, on the Northern Island. The crew, consisting of 28 men, all escaped on shore, as also one woman and two children. About 30 or 40 natives came the third day after we were wrecked. We had made tents on shore of our sails. The crew were at that time armed with ten muskets saved from the wreck. The natives began plundering the wreck, and also what we brought on shore. They showed no violence at this time, the principal number not having yet appeared. We endeavoured to prevent their taking our things by shoving them from the tents, but offered no violence to them. They must have seen our muskets.

“On the 7th May about 200 more natives came down, and they told us directly they [436] came that they had come purposely to kill us. They did nothing that day, but on the following day they came all naked, and at least 150 with muskets, and the rest with tomahawks and spears. They did not attack us until the 10th. About eight o’clock on the morning of the 10th they again made their appearance in a body under arms, and they struck one of the crew on the head with a tomahawk, and then cut him right in two. Another, named Thomas White, they cut down. We immediately then opened fire, which they returned. We engaged them nearly an hour, and we took altogether twelve men. We understood there were twenty or thirty of the New Zealanders shot, but some say there were less. The New Zealanders latterly dug holes in the ground, and fired from behind them, leaving only their heads exposed. They closed upon us, and we were obliged to retreat. They got possession of my wife and two children. They cut her down twice with a tomahawk, and she only was saved by her comb. We were making

our retreat to a place named Materoa [?Moturoa], about forty miles to the northward, firing as we went. We met another tribe consisting of about one hundred coming up to the wreck. They stopped us, and stripped us of our clothing. We gave ourselves up, having expended all our ammunition. They kept us on the spot for three or four hours, and then permitted us to proceed to Materoa, sending a guide with us. They put us into a fenced place, which they call a pa, a sort of stockade. There they kept us three days, naked as we were. They gave us some potatoes. The party on the third and fourth days returned from the wreck, and in the morning they took us out from the pa, each man who had taken off our clothes claiming the man he had stripped as his slave. We went to our several masters, and some of them gave back a shirt, and some a pair of trousers. About a fortnight after, they told us that one boat remained at the place where the Harriet was wrecked, the others had been burnt with the dead. I proposed to them to allow us to go in the boat, promising to return with a cask of powder in payment for it. They went for the boat to the wreck, and brought it to Materoa. They consented to allow me and five more men to go away in the boat, but detained my brother and eight men as hostages. We repaired the boat as well as we could, and departed, accompanied by three native chiefs, and another of the crew who escaped to us. We were two days and two nights at sea, and fetched into Blind Bay in Cook Straits. We were eight days making Cloudy Bay; we found Captain Sinclair of the barque Mary Anne there, who lent me a boat. I procured some things from Captain Sinclair with the view of returning to Materoa to ransom my family and the other prisoners. In Port

Nicholson we met in with the schooner Joseph Weller, and the master (Morris) took us on board, agreeing to call at Materoa on his way to Port Jackson, to land at the former place the three chiefs and the ransom, and take away the prisoners. The wind would not allow us to make Materoa, and we were obliged to bear up for Sydney, whither we brought the three chiefs, having arrived here on Tuesday last. The chiefs did not object to being brought to Port Jackson, but they would, I think, have preferred being landed at Materoa.

“It is my opinion that the object of attack of the natives was to obtain plunder, and to devour those whom they might kill. I think that the nine men would easily be obtained from Materoa, but that the woman and children could only be obtained by paying a ransom, which could be done through the Materoa tribe. The name of the other tribe is “Hatteranui” (Ngatiruanui). I believe if a ship of war were to go there, and a few soldiers landed, they could be got without ransom. The woman is about forty miles south of Materoa. With a northerly wind a ship might go nearer than that. A blanket, a canister of powder, some fish-hooks, and other trifling articles, would be sufficient ransom for each man; but more would be required for the woman and children. I think that by keeping the three chiefs on board until the whole of the prisoners were returned would be the means of getting them back, but not without a ransom.

“There are only about 100 natives in all at Materoa. The tribes could not raise above 300 men in the whole, and about 200 muskets. If a ship of war were to go down and threaten to destroy their huts, I think they might be

induced to give up their prisoners. Their pas could be easily destroyed by fire. I have been trading with the New Zealanders since 1823, and have lived a great deal amongst them. I am the only person of those who were wrecked who came to Sydney; the rest remained at Cloudy Bay.

“Before we were attacked by the natives two of the crew deserted to them, taking with them some slop clothing and five canisters of gunpowder. I am positive they supplied the [437] natives with the powder with which they attacked us, but I do not think that they instigated them to the attack. These two men accompanied the tribe on their return to Materoa from the wreck, and were allotted out as slaves in the same way as ourselves. They remained there when we left, and formed part of the nine that I mentioned as detained there.”

“The Governor of New South Wales, Sir Richard Bourke, lost no time in communicating with Captain Lambert, the captain of H.M.S. Alligator, requesting him to proceed in that ship to obtain the restoration of the British subjects then in the hands of the New Zealanders. In his official letter to him his Excellency says:—
‘Considering the existing relations of Great Britain and this colony with New Zealand, and the number of British residents on the northern part of the North Island, the Council are of opinion that it will be advisable to abstain from any act of retaliation against the guilty tribe at Cape Egmont, lest it should excite a spirit of revenge or hostility in those tribes situated to the northward, among whom the British residents being placed, their lives and property are in a great degree at the mercy of the natives.’

It will therefore be proper to endeavour to obtain the restoration of the captives by amicable means, and to represent to the tribe concerned in these outrages, that a recurrence of such conduct will lead to the destruction of all their vessels, houses, and settlements near the coast.

“If the restoration of the prisoners should not be accomplished by amicable means, the Council recommend that force should be employed to effect it; and if it shall appear to you desirable, I will direct a military party to embark on board the Alligator, to assist you in this proceeding.”

“Captain Lambert lost no time in carrying out this new service. In a few days the Alligator, having on board Lieutenant Gunter and a detachment of the both or Queen’s Own Regiment, weighed and made sail from Port Jackson in company with the Isabella, colonial schooner, on board which Captain Johnson, of the same regiment, and another detachment of soldiers were embarked to co-operate with Captain Lambert.

“Mr. Guard, late master of the Harriet, Mr. Battesby, appointed to act as interpreter, and a pilot named Miller, accompanied the expedition. The two last were landed under a pa called the Namu, belonging to the Ngatiruanui tribe, and instructed to acquaint the natives with the object of the visit paid them by His Majesty’s ships, and the anxious desire of Captain Lambert to avoid hostilities; also to express his determination not to give any ransom for the prisoners, and his readiness to employ force for their recovery should force be required to effect that end.

"Dr. Marshall's account of the expedition now proceeds:—

"It being deemed necessary that the interpreter should proceed by land from the Namu to the Waimate, a pa belonging to the Taranaki tribe which held the women and children in captivity, the Alligator and Isabella worked along shore until abreast of that and another pa, the Rangituapeka. Here the anchor was let go and an unsuccessful attempt made to negotiate the business amicably, Guard professing to interpret between the officers and the natives on the beach, although grossly ignorant of the New Zealand language.

"The following day weighed and shaped a course for Admiralty Bay, in Middle Island, but came to in an open bay to the north-west of Port Jackson. Eight days after we made sail back to Cape Egmont, and at six p.m. on the following day the preconcerted signal of two fires on the cliff having already apprised us of the interpreters' safety, a boat was sent ashore for them at the Namu. On their coming on board they looked worn and woe-begone, and gave the following account of themselves:— The night on which they landed they were frightened almost out of their wits, expecting to be put to death by the natives, and under the influence of panic eloped from the pa as secretly and with as much despatch as possible, and set off for Waimate, but failed to reach it in consequence of meeting, when within a few miles thereof, with a party of natives, who aggravated their fears by the information that the Taranaki people were looking out for and intended to kill and eat them. This induced them to retrace their steps, but being afraid to

return to the Namu until the ship hove in sight, they took to the bush for shelter by day, and only ventured abroad under the cover of night, being content in the meanwhile to feed upon bread and water. Fear, hunger, and fatigue at last overcame them, and when they again joined the savages they delivered another version of the message they were entrusted to carry, deeming themselves excusable in altering it from necessity,—equally the plea of tyranny and cowardice,—and consequently at liberty to deceive the unsuspecting savages with promises of trade, [438] barter, and a ransom, which they knew well would never be fulfilled. One of these promises was, that on the delivery of the prisoners the natives were to receive a barrel of gunpowder, etc., by way of ransom. And another unworthy deception was that the two ships of war stood in need of large quantities of whalebone, and that the natives would find a ready sale for all they could collect. [On the way back to Port Jackson, one of these men, relating how they had dealt with the natives, described himself as hardly able to contain his laughter at the way his companion “bounced” or lied to the New Zealanders on this occasion.] By such means, less disgraceful to the men who employed them than to those by whom such men were themselves employed on such a mission at all, it was finally arranged that “the woman” should be brought down to the Namu, in readiness to be given up at the next visit.

“The next day the ship was piloted by Guard to a second harbour on the west side of Admiralty Bay, and the anchor let go there in fifteen fathoms. The parties destined to act against the natives were landed here to exercise in firing at a target, etc.

“Two days after we again weighed, and made sail from Port Hardy, so called for the first time out of respect to the gallant Sir Thomas Hardy, Nelson’s flag captain at Trafalgar. The following day we arrived at Moturoa, the Sugar Loaf Islands of Captain Cook, by which the northern extremity of Cape Egmont is terminated. Here four New Zealanders who had been provided with a passage from Sydney were put on shore, heavily laden with rusty muskets, flints, powder, ball, etc., the boat in which they landed bringing off eight seamen who had belonged to the crew of the Harriet, and formed a majority of the captives whom the Alligator was despatched to rescue. They looked exceedingly haggard and poverty-stricken, having been but thinly clad and only scantily fed for the four previous months; but, notwithstanding, bore favourable testimony to the treatment experienced by them at the hands of the barbarians, who, so long as they were content to minister to the necessities of their own bodies, exacted neither labour nor toil from them, but shared with them whatever they themselves had to eat. Captain Lambert very kindly proposed to clothe these men from the purser’s slop-room at his own cost, upon which a subscription was entered into by the officers and the captain, and the naked were speedily clothed. But they were a base and selfish set of men, altogether unworthy such an act of private beneficence, as was some time afterwards seen in their refusal to take part in working the Isabella, where they were furnished with accommodation and food on their way home, *unless paid for doing so!*

“Of the natives who were now landed I had been a vigilant observer during their stay on board, and am led

to believe that they were harmless, inoffensive, and, in three instances out of the four, good tempered. They would not taste any salted meat, and accordingly came but poorly off for provisions, save on those days when flour was served out. The bread which was generally served out, especially among the junior officers and seamen, was abominable; worse, far worse than is supplied to the convicts of New South Wales—and the purser's steward had put those poor fellows off with the mere bread-dust—yet they seemed very contented with their fare and never complained but once, and then on very sufficient grounds.

“I inquired of the above natives whether they would welcome a missionary if one should be sent to them. The answer was: “Yes, but he must stay with us, or the other tribes might kill him.” Mr. Guard, who was standing by when the above inquiry was made, at once scouted the idea of New Zealanders becoming Christians. I asked him how he would propose to effect their civilisation in the absence of Christianity. The reply, made in serious earnestness and a tone of energy and determination, at once unmasked the man, and made one’s heart sick at the thought that, upon his uncorroborated testimony, an expedition was fitted out against New Zealand likely to be fraught with disastrous consequences. “How would I civilise them: Shoot them, to be sure! A musket ball for every New Zealander is the only way of civilising their country.

“When Guard quitted Moteroa, he left behind him the promise of returning for his companions, and of bringing with him a cask of powder in payment for the boat in

which the Ngatiawa tribe assisted him to escape, and accordingly they demanded the fulfilment of this pledge, but were refused it, as also everything in the shape of ransom for their prisoners. Was this treachery, or was it not? If it was, on whose side does it lie? Not on the side of the New Zealander, for he fed, lodged, and protected those who had confided themselves to his keeping, but on that of his civilised neighbours, who violated their pledge and betrayed the truth reposed in them by the savage.

[439]

“Pending the long negotiations respecting the sailors, the Alligator’s best bower anchor had been let go on a rocky bottom and could not be again weighed when the business was concluded; it had therefore to be left behind, and was, with from twenty to thirty fathoms of chain cable, lost. The value of these far exceeded the price it would have cost to redeem the enslaved, and had that price been forth coming there would have been no necessity for negotiation, no time need have been lost, the anchor might still have hung from the bows, and the chain reposed quietly in its tier.

“Two days after this the landing party were collected together on board of the Isabella for the greater facility of disembarking. But Captain Johnson and the senior lieutenant of the Alligator, Mr. Thomas, having gone in the whaleboat to reconnoitre, the former considered the surf impassable and the landing was consequently postponed. Mr. Battesby, who had gone on shore, brought off information of the female captive and one of her children being at the pa, in readiness to be delivered up by their captors on payment of their promised ransom.

A native of a highly intelligent countenance and very pleasing manners, took a passage in the boat from the shore, being desirous to visit the ship. The seamen and marines returned on board of the Alligator from the schooner, leaving all the soldiers and Guard's sailors there. These latter had so heightened, by their respective accounts of the savages, the general excitement which before prevailed, that the utmost impatience was manifested by all parties at the successive hindrances as they arose to our landing.

““However, it was four days after this before the wind came round to the northwest, and with the change of wind the surf greatly subsided, thereby enabling detachments of seamen, soldiers and marines to disembark, which they did on a beautiful beach, in face of a high cliff; when we had occasion to witness the vast superiority for a mixed service, “by sea and land,” of that valuable corps, the Royal Marines, over their comrades, the mere soldiers. While the one took their muskets in their hands and descended the ship’s side with agility, and stepped out of the boats as light almost as the sailors themselves, the unfortunate landsmen had to encounter a dozen mishaps between the ship’s gangway and the boat’s gunwale, a dozen stumbles and falls before they could be quietly seated in the boats at all, and at least as many risks of being completely souused before they could obtain a safe footing on shore.

““While the military were falling in, two of the natives came along the sands, advancing, unarmed and unattended, to meet us; the heights above being crowded with others of their tribe, passive spectators of what

might happen below, very few carrying muskets. One of the pair, on coming up to us, announced himself as the proprietor (or chief in charge) of the woman and her child, and was recognised to be so by Guard, with whom the unsuspicious chief rubbed noses in token of amity, at the same time expressing his readiness to give up his prisoners on receiving the “payment” guaranteed him by his veracious—or, rather, lest my meaning should be mistaken, by his mendacious—friends, our very honest and competent interpreters! In reply, he was instantly seized upon as a prisoner of war himself, dragged into the whaleboat, and despatched on board the Alligator in custody of John Guard and his sailors.

“On his brief passage to the boat insult followed insult, one fellow twisting his ear by means of a small swivel which hung from it, and another pulling his long hair with spiteful violence; a third pricking him with the point of a bayonet. Thrown to the bottom of the boat, she was shoved off before he recovered himself, which he had no sooner succeeded in doing than he jumped overboard and attempted to swim on shore, to prevent which he was repeatedly fired upon from the boat, but not until he had been shot in the calf of the leg was he again made a prisoner of. Having been a second time secured, he was lashed to a thwart, and stabbed and struck so repeatedly that on reaching the Alligator he was only able to gain the deck by a strong effort, and there, after staggering a few paces aft, fainted and fell down at the foot of the captain in a gore of blood. When I dressed his wounds on a subsequent occasion I found ten inflicted by the point and edge of the bayonet over his head and face, one in his left breast which it was at first feared would prove, what

it was evidently intended to have proved, a mortal thrust, and another in the leg.

“Was this treachery, blood-thirstiness, and cruelty, or was it not? If it was, on whose side lies the guilt thereof? Assuredly not on the part of the New Zealander, who, with one only companion and without arms or weapons of war, ventured among us with a firm step and friendly face, fearing nothing because suspecting nothing. And, as assuredly on the part of the British, who met his confidence [440] with arrest, and not only not according to law, either human or divine, but contrary to all law, both divine and human, made war upon one man, we being armed and he unarmed, and seized, and smote, and wounded, and well-nigh murdered that unprotected solitary man, when in the very attitude of a pacifier, and in the act itself of friendly negociation.

“In the meanwhile the other native was joined by two more, who came without apprehension of personal danger, to trade with their treacherous invaders; one bringing a bunch of onions in his hand, the other a bundle of fishing lines, and both, like their predecessors, unarmed. One of these also was seized and detained as our prisoner, the others fled on perceiving the boat’s crew fire upon their chief, and our second captive took the earliest opportunity of making his escape likewise, which he was the better enabled to do, from the blind impetuosity with which the landing party pushed on for the Namu pa.

“That pa was found deserted of all its inhabitants, except a solitary pig. But the heated ovens in every direction in which their ample dinner of potatoes was preparing,

supplied abundant evidence of their having been taken by surprise; while the abandonment of their fortress, whence, had they but continued in it, they might have shot every individual of our party before we could have reached the foot of it, seemed to imply that they had no idea of our landing being otherwise meant than in friendship.

“All hands immediately divided into two parties, and commenced a chase in pursuit of the fugitives, when the double alarm was [441] raised that a body of armed natives had been seen in the swamp below, and that an attack had been made upon the boats. Both were true. The midshipman who had been left, with a few men, in charge of the boats, reported that he and the boat-keepers had been fired upon from the cliff, while a strong body of New Zealanders made a rush to get possession of the boats, which they ransacked and succeeded in emptying of every transportable article, including clothes, haversacks, etc., while he, deeming resistance useless, and being unwilling to cause needless bloodshed, drew off the men and made good a retreat, leaving the boats in quiet possession of the savages, who, could they have known that these were all we had save one, might very effectually have cut us off from even the possibility of escape. The party of natives having the woman and child in custody had escaped past us as we entered their pa. They were instantly pursued by Lieutenant Thomas, but in vain, and on his coming up with Captain Johnson on the height which overlooks the beach where the boats had been plundered no trace of a single native remained. A strong picquet was planted here to guard against future mischief, and the rest of the party returned to the pa,

where every individual curiosity found full occupation in examining the neat and curious huts of the poor outcast inhabitants.

“There were only two entrances to the Namu pa, and they might have been defended by a dozen resolute individuals against a company of soldiers. One of these entrances being hardly perceptible from the outside, while the ascent to the other was facilitated by a notched stake of wood, which rested upon a perpendicular cliff facing the beautiful running stream, whereby the triangular rock on which this pa was built is separated from the mainland to the southward. [Here follows a long and particular description of the pa, which I omit.] The chief’s house was readily distinguished by its size, ornaments, and situation. It was twice as large as any other; five grotesque figures, rudely but elaborately carved, adorned its front, which, being mistaken by the soldiery for native gods, were torn down and appropriated for fuel during the night..

“In expectation of overtaking the party of natives who quitted the pa at one end as we entered at the other, Mr. McMurdo, senior mate of the Alligator, had been despatched in charge of a few men. He returned in about two hours’ time with the intelligence that he had come up with and nearly surprised a body of fugitives, but was discovered by them before he could secure any. The instant they perceived his approach they fled with the utmost precipitation, throwing away in their flight potatoes, fishing-tackle, and other articles with which they had originally attempted to make off, but of which

they now sought to disencumber themselves in order to facilitate their escape.

“The afternoon proved wet and comfortless, and the absence of everything like employment left the men at liberty to explore their new territory, and provide themselves with lodgings for the night, every half-dozen persons choosing for themselves a separate habitation, of which there were plenty.

“At daybreak on the following morning, in consequence of a report made by John Guard that he had fallen in with several huts at a little distance, and his conjecture that any natives who might be lingering in the neighbourhood would have sought to them for shelter from the inclemency of the weather during the night that was past, four of the officers, Lieutenant Thomas, Alex. Gunton, Dyke, and myself, set off with a party of bluejackets and marines to reconnoitre. The morning was mild and the day-dawn beautiful. After more than an hour’s march from the pa, we halted upon learning that a further march of at least ten miles lay between us and any of the native huts, and it was determined therefore to return. Retracing their steps, our party re-entered the pa, just as the morning picquet returned, the officer of which announced that the natives had been seen in considerable numbers to the southward, and Captain Johnson determined upon trying to obtain an interview with them; and accordingly, after partaking of a standing breakfast, we set off for that purpose, escorted by the interpreter and four seamen, who were selected in preference to soldiers, lest the natives should be intimidated by the red coats of the latter.

“The native foot track led across a small rivulet of delicious water; but no appearance of the natives was visible until we came to a grove of trees, on rounding which, several stragglers hove in sight, to disarm whom of their fears, if any, the sailors were ordered under cover, and Captain Johnson, the interpreter, and myself advanced towards them. In a little while Mr. Battenby was sent forward to confer with a group of natives, after talking to whom for some minutes he was seen running back towards us and away from them. Upon which I advanced and met the runaway, fearing lest he should be cut off by a little body [442] of men who were at this time hastening after him. Having joined him I found he was flying from his own fears, being alarmed at the approach of other natives besides those with whom he was conversing, and we returned together to resume the conference with the savages, several of whom, with their muskets in their hands, occupied a small pass through a second grove of trees, to the possession of which, from its earthen breastworks, they seemed to attach considerable importance.

“The arms we had with us were a brace of pistols and a sword, and we were met by two New Zealanders, who advanced with their firelocks in their hands, on seeing which Mr. Battenby pointed his pistol at them and gave them to understand that they must lay down their muskets before he could suffer them to come nearer his person. In reply, they called to him to look at the pistol in my belt, and signified that I ought to lay down that weapon of mine if they were to dispose of theirs, and, of course, upon being made acquainted with so reasonable a verdict, hoping by confidence to beget confidence, I deposited the

dreaded pistol in the grass at my feet, and stepped forward with open hand to salute them. At first, it was not a little diverting to see the timidity with which they were seized, but in a minute or two we were excellent friends, shaking hands together much more heartily than there was any need to do, and shortly entered upon the subject matter of debate between us, when they informed us that "the woman" had been removed to Te Waimate pa; laughed at the idea of our attacking that place as preposterous; accused us of deceiving and betraying them, and said we had behaved "badly, with exceeding badness, to Whiti," their wounded and captive chief, who, they declared, had been murdered by us, and was now, they doubted not, quite dead, for the night before they had seen his spirit pass over their heads in a falling star, etc. Encouraged by the sight of their companions' safety, other natives now drew near and joined in the conversation. Failing to convince them that Whiti was yet alive, they could not be persuaded that his freedom might at any time be purchased by an exchange of prisoners, and finding this impediment in the way of an amicable adjustment of differences, we were compelled to bring our conference to a close; but in doing so my companion again exhibited his moral unfitness for the responsible office to which he had been appointed by the Sydney Government of interpreter. Turning round to me, he asked, with the most perfect simplicity of manner, "Shall I bounce them?" "Bounce them," I replied; "what do you mean by that?" "Shall I tell them a lie?" "Certainly not; but pray what lie do you propose to tell them?" "Why, that if they don't promise to deliver up the women and children, we shall set fire to the Namu pa." Alas! alas!

that would have been no lie, as it afterwards proved, for upon that measure the mind of him who commanded our party was already made up.

“For the office of an interpreter between parties who are or are likely to become belligerent, moral honesty and personal and moral courage are equally indispensable, for where these are wanting each party is liable to misunderstand and to be misunderstood; the disagreements between both are likely to be multiplied, and the previous breach to be widened beyond the limits of forbearance. The absence of all three in the person chosen to accompany us was abundantly certified by the little incident now related, when coupled with what took place between him and the natives on a former occasion, and his consequent incapacity for the office which he filled placed beyond the possibility of doubt or question.

“Having furnished Captain Johnson with an account of our interview, that officer proceeded again to Namu, for the purpose of burning it to the ground. And accordingly, immediately on his arrival there, fires were kindled in every dwelling, and all the stockades pulled down, and with other combustible materials added to the flames. In less than an hour after nothing was discernible of the poor New Zealanders’ town but blazing ruins and burning embers, the officers and men concerned in this work of destruction returning on board as soon as it was accomplished, where we found the captive chief in a cot, suffering far less from his many wounds than had at first been anticipated, and highly gratified with the attentions he had received, as well as satisfied that all the Alligator’s “rangatira,” or officers, wholly disapproved

of the brutal outrage perpetrated upon him by the master and crew of the whaleboat.

“In the afternoon the ship was found to be drifting towards the shore, which, and there not being a breath of wind, rendered it necessary that she should anchor, when the anchor was let go in fourteen fathoms. It was again weighed at sunset, but only to be dropped again in less than twenty minutes after; and it was past midnight before she was fairly at [443] sea, and entirely safe from the peril of shipwreck on a coast which, if not naturally inhospitable, would in all likelihood have proved so to us, from the character of our recent intercourse with its inhabitants. Was not the merciful interposition of Divine Providence on our behalf designed to reprove our own unmercifulness towards others in the transactions of the two previous days, and ought it not to have engaged our mercy on behalf of the New Zealanders in any subsequent dealings we might have with them?

“Next morning we were running along shore for Te Waimate, in from seven to ten fathoms of water; the appearance of the coast was such as sailors call ironbound. At noon the mountain bore N. by W., and we were distant about five miles from Te Waimate Pa, off which the water shoals suddenly from five to four and three fathoms, with an uneven rocky bottom. At 2 p.m., out boats for the purpose of negotiating with the natives, who were seen in crowds upon the neighbouring heights, and swarming like bees upon the two pas and along the sea-shore. Mrs. Guard and her child were brought down to the beach by her keepers, and was very distinctly seen from the boats waving her hands to warn her deliverers

off, the policy of the savages being, at this juncture, to seduce our men to land and then to repay treachery with treachery.

“At 3 p.m. the boats returned, having landed the native who first visited us from the Namu, and had remained on board as fearless as at the beginning throughout the melancholy transactions at that place, and whose quiet demeanour, apparent intelligence, and interesting manners during his stay, had engaged the goodwill of both officers and men. In landing him thus freely, it was due to the confidence he had reposed in us, while the policy of the measure was obvious, inasmuch as he would be able to testify to the humane treatment finally experienced by Whiti, and might also persuade his tribesmen that we possessed the means of spreading destruction along the coast, and of razing to the ground all their defences.

“At 6 p.m. another boat was sent in to endeavour to learn the result of his liberation, but the dashing of the surf and the roar of the breakers between the boat and the beach allowed not of any audible interchange of words between them. It was evident, notwithstanding, that some question was still under discussion, for large numbers of natives were assembled in circles, seated on the sand, and apparently listening with attention to a succession of orators.

“The next morning at ten, two boats were again despatched to confer with the natives. In one of these was Whiti, whose anxiety to be released lent him strength for the occasion, while his wounds, sufficient to have killed outright any man with a European constitution, appeared

to occasion him comparatively little inconvenience, beyond the weakness incidental to excessive hemorrhage. This may be accounted for by two facts in the character of the natives of New Zealand, who have not been contaminated by intercourse with Europeans—their temperance in eating, and their almost abstinence in drinking.

“Whiti, when the boat came within hearing of his tribe on the beach, stood upon one of the thwarts and harangued them for a few minutes, whereupon they all set up a shout of gratulation, and several waded through the surf up to their mouths in water, hoping to get near to the boat in which he was, but failing to do so, deposited their female prisoner and her infant in a canoe, launched it from the shore, and brought them off alongside the Alligator’s gig. In a few minutes more they were safe on board that ship, and under the protection of His Majesty’s pennant. She was dressed in native costume, being completely enveloped from head to foot in two superb mats, the largest and finest of the kind I have ever seen. They were the parting present of the tribe among whom she had been sojourning. She was, however, barefooted, and awakened, very naturally, universal sympathy by her appearance. From her own lips I gathered the following particulars of what had befallen her in the interval between her removal from the Namu Pa and her release at Te Waimate:—

“When the parties from the ship landed at Te Namu, she was, as had been stated by Whiti, at that place, and in custody of one man alone, Waiariari, the principal chief of the tribe, who, on seeing the firing from the boat and

the rapid advance of the English, forced her out of the pa, rolled her down the cliff, and then with the assistance of another native who had lurked outside dragged her along the northern bank of the river at a very hurried pace until the evening, when they reached a cluster of huts and halted there for the night. The following morning early they all set off for Te Rangituapeka Pa, and arrived there about 5 p.m. Under the impression that the chief Whiti had been killed, one of her companions snapped his [444] musket at her, but very providentially it missed fire; he then cocked it a second time, and was about to fire, when she was endued with presence of mind enough to lay her hand upon the barrel and turn it aside, while she rushed to Waiariari and clung to him, till his repeated command not to kill the woman extorted a reluctant obedience from his more implacable subaltern, and the present danger was accordingly averted. At one time it appeared to herself a certainty that if Whiti were really dead her life would be forfeited in retaliation; and the native female to whose care her infant was committed declared that in such a case, the infant, being left without a mother, would be given up "for one of the rivers to drink," that is, would be drowned. With the exception of these threats, however, they treated her as before, and of the treatment she had all along experienced at their hands her report was extremely favourable.

"In Te Namu Pa, for instance, the lodging allotted to her was discovered at once by the size of the door, the addition of a small window, on the ledge of which was the soap she had that day used, and inside her child's frocks and her own stays. The door had been enlarged purposely for her accommodation, the window had been

made in compliance with her request, and a singular proof of considerate kindness and deference to her supposed delicacy of feeling was furnished in the owner having caused the entrance and window both to be secluded by a close paling set up in front of the house which effectually screened her from observation from without.

“The safe return from the ship of the native whom we had the day before landed, with intelligence of Whiti’s safety and the assurance that he would be given up instantly upon her release, was welcomed with loud and longcontinued acclamations, and a very general cry of—“Let the woman go! let the woman go!” was preliminary to those three rounds of applause which had been heard from the ship the evening before, but not understood.

“The night before that, however, had been spent in wailings and lamentations, reproachful and recriminatory speeches. “What fools we were not to cut up their boats!” was the cry of one party; while the complaint of the second was—“What fools we were not to shoot them all as they stepped on shore!” and had either of those measures been resorted to, doubtless we should have been seriously inconvenienced, even if we had not been altogether cut off from every way of escape. There were not less than six boats drawn up on the beach at one time, all of which might have been broken to pieces as readily as they were plundered, for all the opposition that would have been offered by the boat-keepers; while, had the New Zealanders fired upon us before we commenced marching towards Te Namu pa, it would scarcely have been possible for the whole of our party to reach it alive.

Surely there was a gracious and merciful Providence keeping watch over us on that occasion, to whose mercy and goodness alone it is owing that we are now among the living, either to praise Him who preserved us, or to continue unmindful of His benefits, unthankful and unholy.

“They passed the night of their tribesman’s arrival in a far happier mood. Forming themselves into widening circles, circle within circle, and placing him in the centre, they made him repeat again and again his tale of marvel, drinking in greedily all he had to say, while describing and expatiating on the many wonders of the “war ship”—her five decks and five hundred men, the daily sword and gun exercise, with many other matters, all equally exaggerated either by his fears or his fancy, and not allowing him the respite of a single lengthened pause without interrupting his silence by loud vociferations of “*Tena korero, tena korero*” (Go on, go on; talk away, talk away).

“Captain Lambert had promised Whiti that he was to be set at liberty upon the receipt of this woman; and notwithstanding that another prisoner (the little boy) yet remained to be delivered up, he judged (as I think any honest man, and much more any man of honour, would have judged) that the promise was binding upon him, and very properly allowed the captive to go free. Yet that was looked upon by some as an act of uncalled-for leniency, and by others set down as a piece of mawkish refinement, alike inexpedient and impolitic. Such men would do well to reflect upon the noblest eulogy pronounced upon that prince of modern orators and statesmen, Edmund Burke,

if, indeed, such men possess minds capable of understanding the excellence of any man who is, with him, “too fond of the right to think of the expedient.” The right, in short, is always the expedient, and, were it not that all men have not faith, that would never be deemed expedient to be done which, in the abstract, it would not be right to do.

“Accordingly, Whiti had his wounds carefully dressed for the last time, received a supply of trifling articles as farewell gifts, and was [445] rowed to the back of the surf, where a canoe waited to carry him through it, into which he stepped, and was straightway paddled by willing hands on shore. Before quitting us he had apparelled himself in some of his various presents, putting on first a blanket; over that forcing on a shirt, and through both contriving to humour his arms into a jacket, this latter being so worn as to button behind instead of before; and having finished his toilet, and completed his disguise by a Scot’s cap drawn over his eyes, escaped from our custody as proud of his new plumage as any beau just released from the more gentle hands of some fashionable tailor. His friends were impatient to greet him, and before he had time to be landed they waded up to their necks in water, surrounding the canoe, to meet and rub noses with him, after which both parties wept aloud, then sang and danced for joy.

“While the boats lay upon their oars, several natives came through the surf with trifling articles for barter, and gladly exchanged as much line as in Sydney would have cost from four to five shillings for a fig of tobacco (then scarcely worth a penny), and at the same rate brought out

their potatoes for sale, in baskets weighing about twenty pounds. This harmless traffic had no sooner commenced than it was prohibited by the officer commanding the boats, very unwisely, it being one of the most evident means of conciliating the natives, and thereby inducing them to resign in peace their only remaining prisoner. A little while after Mr. Battenby cautioned Lieutenant Thomas to beware of treachery, as he saw, or fancied he saw, movements among the crowd on shore indicative of hostility, upon which warning both boats returned on board, leaving a little boy still captive among the Taranaki tribe, who hesitated to give him up, because, as they alleged, his more immediate owner was at a distance; promising, however, to convey a message to him with our demand, and appointing the afternoon for us to receive his answer.

“At 1 p.m. the senior lieutenant again approached the shore, but the boat in which he was, had not lain long on her oars before a ball whizzed over his head, discharged from the musket of some one in the Waimate pa, and he came back to the ship to report the circumstance, which, with the war dance that accompanied it, was deemed a signal of defiance, and worthy of being summarily avenged. The drum now beat to quarters, both vessels edged towards the shore till they touched bottom, and a furious cannonading took place from both, the direful effects of which it is impossible to estimate, seeing that it continued for nearly three hours, and that most of the shots told with fearful precision upon the canoes floating in the river on one side of the pa, or drawn up in the fosse on the other, and upon the roofs of the houses in the pa itself. When the firing began the natives hoisted a white

flag, but after some minutes had elapsed lowered it again, and then after a second pause re-hoisted it. Was that symbol spread out as a flag of truce? Could it be that those unhappy wretches meant by displaying it to deprecate our further wrath? None of us knew, few cared, and fewer still were at the pains to inquire. It seemed as though a signal, sufficient when used in the warfare of civilized nations to command instant respect, and an immediate cessation, however temporary, of hostilities, was powerless when shown by a savage people, though to civilized enemies; or as if when a civilized power condescends to make war upon savages, it is at liberty to throw off the restraints imposed by civilized society upon nations as well as individuals, even at seasons of greatest license, and may become as utterly and deplorably savage in its conduct as its most savage neighbour. At one time a tall, athletic native got upon a house top and held up to our view with one hand the little captive boy, while with the other he repeatedly waved the white flag over his head. In vain! the work which was commenced in anger was continued in sport, and it was deemed too excellent a joke to demolish their canoes and houses by firing at them as at a mark for aught to be suffered to interrupt the cruel play of men who, on this occasion, proved themselves to be but children of a larger growth in both size and wickedness. Throughout this ostentatious and melancholy parade of the power we possessed to do mischief the unfortunate New Zealanders displayed the utmost fearlessness, evincing no apprehension of danger beyond that of sending away their women and children; but, on the contrary, tracking with apparent eagerness the flight of the shot, and having marked where they fell,

running to and fro upon the beach, exposed all the while to our fire, to pick up the balls, thinking, perhaps, to melt them down into bullets for their own muskets, which, as if in mockery of our attempts to dislodge them from their rocky abode, they would occasionally fire at us in their turn; but we were very far out of reach of any power [447] possessed by them to render us back evil for evil,—and having crushed all their canoes that were in sight, wearied ourselves with shooting at a rock, and wasted a large quantity of ammunition with no beneficial result, stood out to sea once more.

“The fatal bullet which had caused all the above firing, in vindication of our insulted flag, was very probably, according to New Zealand custom, no indication of hostility at all, but contrariwise, of friendship. It is their usage to discharge their muskets in the air when approaching as friends, and to reserve their fire when advancing as enemies. Had we not been strangers to this usage, or had we any one on board who really understood their customs, we should have judged differently of the deed we were so hasty in avenging, and might have acted differently in reference to it. How superior the conduct of the New Zealand savages to that of the British Christians—if I may be allowed, for the sake of the antithesis, to desecrate that sacred title by yielding it as a name, not characteristic but recognised and claimed by those of whom I am speaking. The former beheld their chief kidnapped, stabbed, struck, fired upon, carried into captivity, and for aught they knew to the contrary, murdered; but they murdered not the innocent woman and her two children in revenge; nay! they did not even ill-treat her for the injury done by her countrymen, on her

behalf! We—oh! that I could spread the blush of burning shame that crimsons upon my own cheek over the cheeks of all that read this narration, at the dishonour done my country by her children! We heard, but felt it not; saw, but were struck not by it, as a solitary musket ball whizzed over our heads, and in the pride of our indignation poured down in reply a thunder-storm of shot—round, grape, and canister—upon a town which, for aught we knew, or felt, or cared, might have contained scores, nay, hundreds, of women and children. Oh! shame, shame, shame!

“The three following days we were at anchor in Port Hardy, of which Lieutenant Wood had now time to complete the survey. The next day we weighed and made sail again for Te Waimate pa, and at 11 a.m. on the day after the gig was sent in to demand the child, and the officers who went in her were invited by the natives to land, but declined doing so, and came back as they went. At 2 p.m. another unsuccessful demand was made for the child, a look-out being kept in the meanwhile for an easy landing-place, of which the New Zealanders seemed fully aware, as they brought the youngster down to the beach opposite the pa, offering to give him up if the boat would pull towards that place, but refusing to do so after they had succeeded in drawing her away from the spot at which alone a safe landing could be effected in such boats at the Alligator’s.

“The next morning the boats were again sent in at an early hour, but with no better result than before. A message, however, came off to the ship in one of them to the effect that the holder of the child wanted to come on

board with him himself, and would do so if any one of the officers would go on shore in his stead, and remain there to await his safe return. One of the natives also visited us, unarmed and alone, professing to belong to the Kapiti tribe, and after receiving a present of some tobacco and other trifling articles, was allowed to go back unmolested. But Captain Lambert declined granting the request of one of his officers to go on shore as the chief had desired, thinking that such an undertaking would be extremely perilous, and fearing, as he said, to incur the responsibility of allowing the individual in question to expose himself to what Captain Lambert thought would be certain and instant destruction.

“Nothing further occurred for several hours, when upon an alarm of “treachery!” raised by the interpreter, the boats pulled on board again, and the ship proceeded to sea, the men in a state of excitement almost bordering on madness, and everything appearing as if the further prosecution of the enterprise was to be abandoned. Towards the [448] evening, however, we again bore up for Te Waimate, and the following day six officers and one hundred and twelve men, including sailors, soldiers, and marines, were landed without opposition on a sandy beach, about two miles to the south-east of Te Waimate Pa, under a bold and lofty cliff. A small sixpounder carronade, two boxes of ammunition, and a quantity of round shot were taken charge of by the sailors under the command of Mr. McMurdo, and the first gig, carrying a flag of truce, was sent to lie off the pa, to amuse the natives while our men were landing, if not to prevail upon them to launch from their shore the little captive who was endangering their very existence as a tribe;

Lieutenant Clarke, R.M., marching off the marines and some of the military to the right, where, at the distance of about a hundred yards the cliff terminates abruptly. It was escaladed with comparative ease, the ascent being aided by a contrivance of the natives for facilitating their own passage up and down its almost perpendicular face, consisting of two plaited ropes suspended from strong stakes, driven into crevices of the rock, and capable of bearing the weight of several persons at the same time. The gun and ammunition followed the soldiers up this height, but had not all reached the top, when some of the natives advanced to confer with us. These, to prevent embarrassment during the landing of the few remaining troops, were ordered to retire, on peril of being fired at if they refused, but they succeeded in making known, before obeying the command, their desire to settle the affair quietly, and to resign their prisoner forthwith, in consequence of which intimation all hands halted, the soldiers, etc., occupying two heights, which rose like terraces one over the other, and the sailors, with an officer and interpreter, being very indiscreetly left below to await the arrival of the promised prize.

“In a little time one New Zealander after another seemed anxious to approach us, and drew nearer and nearer by degrees, but always at a stealthy pace. To meet such I went on in front of our men, and succeeded in getting near enough to communicate with them. One, a fine fellow, six feet high and upwards, consented to accompany me back; he had no musket in his hand, but, like several more of his countrymen, had a cartouche box slung across his shoulder and concealed under his mat. Subsequent events render it not improbable that his

firelock was at hand, concealed, perhaps, behind some flax bush, in readiness for use when needed, and it was remarkable that at the several stages of his advance towards me he stooped lower than the ordinary stooping gait at which he and his fellows came on, as if to lay something down out of their hands. His tale corresponded with that of his fellows below on the beach and contained an assurance that the child would be presently forthcoming, wherefore he forbade our fighting, alleging as a reason—and was it not a sufficient reason—that his tribe had no wish at all to fight us. While thus conversing with him, through the medium of the pilot (who very reluctantly interpreted his sentences, when he found them altogether conciliatory, at the same time that he expressed the most ferocious hatred himself to the whole race of New Zealanders;) other natives acquired sufficient confidence to join us, and all appeared anxiously solicitous to avert hostilities, corroborating the statement that the child would soon arrive, and at the same time signifying, by a variety of gestures, that the occurrent delay was occasioned by the preparations necessary for his transfer being made decently and in order.

“Suddenly the cry rose upon our ears that the child was coming, upon which my New Zealand friend drew me to the edge of the cliff, whither all feet were now bending their steps, and directed my notice to a procession of about half-a-dozen armed natives, headed by a very stately personage, who wore a white feather in his head and a large and handsome mat across his back, while the captive boy appeared perfectly at his ease, seated astride the chief’s shoulders. Somewhat in the rear followed our

former prisoner, Whiti, apparelled in the dress he had taken with him from the ship, and near him our two voluntary visitants. The native who was with me hailed Whiti, who looked up, and recognising me stopped to "palaver," and was proceeding to do so with considerable volubility, and in apparently very high glee. But, impatient to have a nearer view of the young object of all this pomp and circumstance, I quitted the spot and was hurrying along the cliff in order to descend it, when I beheld the youngster in one of the seamen's arms, and he running away with him towards the turning of the rock, as fast as his legs would carry him. In the twinkling of an eye more, a firing commenced among the sailors on the beach, and the sound and sight thereof being eagerly caught by their companions in arms above, in another moment it was succeeded by a fire from the soldiers on the heights, which ran like electricity along the ranks from man [449] to man, and in utter breach of all faith, for *our* flag of truce was flying at the time, and in as utter despite of all discipline, volley after volley was poured down on the too credulous and too confiding people below, who fled along the beach with the utmost precipitation, one every now and then falling to the ground, wounded or slain, while others crouched down and sheltered themselves behind the massive blocks of stone, which, happily for them, lay scattered along that portion of the beach by which alone they could hope to escape from the fire of their enemies.

"While this cruel and bloody tragedy was performing, Ensign Wright, of His Majesty's 50th, or Queen's Own Regiment, an amiable young man and humane officer, hurried along the line, breathless with haste, and crying

to the men at the top of his voice to cease firing. For some time he was entirely disregarded, and not only generally disobeyed, but in some instances laughed at; nor, until several dead bodies were seen stretched upon the sands, could the united efforts of himself and the other officers put a stop to the frightful tide of slaughter.

“Shortly after Captain Johnson joined us, evidently suffering intense anguish of mind. The firing from below had begun not only without, but contrary to and in direct disobedience of his express and positive orders that the natives were to pass unmolested if they gave up the child. Their prisoner they had already given up. The parties to whom he was consigned were effectually covered by nearly a hundred soldiers above them. The natives who brought him down were a scanty and impotent few; their muskets, as will be hereafter seen, in all probability unloaded. Nothing on the spot had occurred to provoke this sanguinary outrage. Not one jot or tittle of our demands, whether righteous or unrighteous, remained to be ceded. Nothing can justify so foul a deed of blood. And may God of His infinite mercy and goodness to the souls of the perpetrators grant that hereafter something else may be found to account for it besides an insatiate thirst for the lives of others. And may we all lay it to heart, while we shudder to look upon this affair in the light of that law of love which says, “Thou shalt do no murder;” and while we exceedingly fear for our fellow men, lest bloodguiltiness be chargeable against them, may we all—I, whose painful task it is with unflinching fidelity to record these events, and my Christian readers, upon whom I am obliged to inflict the pain of perusing them—may we all lay it to heart, that the guilt of the men

is our guilt, their sin our sin. "Whoso hateth his brother is a murderer," and all mankind are brethren; and remembering this, "Let him that is without sin cast the first stone."

"A cessation of firing at length took place, and it was proposed to fall back on some spot whence we might as speedily as possible re-embark. But every circumstance only militated against the unhappy natives, one of whom, either mistaking the pause in our fire, or willing to avenge himself upon the invaders of his country, discharged the contents of his musket with so deliberate an aim that the ball fell at our feet, whereupon every thought of allowing the business to end without more mischief was dismissed from the mind, and an order to "advance" immediately given, and obeyed with only too much alacrity, the natives on the same height, whom we drove before us, maintaining an irregular fire as they retreated. In this skirmish some more of the natives were wounded, and carried off the field by their friends. A young woman was also killed by a shot from one of the advanced guard. Her corpse was tracked into the bush, and found the following day by one of the soldiers.

"Heavy rain falling, and being drifted into our faces by a strong northerly wind, while the overcast sky threatened a coming storm, it was agreed to halt for the present in a romantic glen, where there was a running stream of water. The question was mooted, whether to advance upon the pa, or fall back upon some spot where the men might quietly bivouac for the night, and be in readiness to proceed in the morning. A majority of the officers carried it in favour of the advance, and having abided the pelting

of the storm, the whole party prolonged their march without meeting any further obstructions until they arrived at the edge of a deep and seemingly impassable ravine, which yawned from beneath as if to devour them, and embedded a river at the bottom, whose waters flowing with great rapidity, and forcing their impetuous way between large masses of rock, occasioned several waterfalls, and added not a little to the apparent difficulty of the pass, over which it became necessary to transport, not only the troops, but also the piece of ordnance and the boxes of ammunition. Captain Johnson, when he came to the brink and looked into the gulf before him, paused in despair of being able to effect a passage, and a last and final halt would have taken place, but for the determination and energy of [450] Mr. McMurdo, through whose exertions the task was finally accomplished, and in less than an hour the whole company stood upon the opposite height, where the natives had once formed an artificial ditch by cutting through the earth and rock beneath diagonally across to the edge of the cliff fronting the sea, so as to insulate a large triangular space, formerly the site of a pa, though nothing now remains to indicate its previous existence except a number of empty pits and a breastwork of earth thrown up on both sides of the ditch to impede the progress of an enemy. The native name of this place is Perakanui, and had the natives made a stand against us here, and chosen the time for doing so when the carronade was at the bottom of the ravine, they might have disputed our transit with success; or, if finally compelled to give way before men better armed, accoutréed, and disciplined than themselves, they, in all

probability, would have been enabled to exact blood for blood, and life for life.

From Perakanui the distance to the remaining pas did not exceed an English mile. On the way to them we passed over patches of cultivations, but neither railed nor fenced in. Arrived opposite the two pas, Te Waimate and Rangituapeka, a circumstance occurred strikingly illustrative of the thoughtlessness which characterises the mere soldier, and the facility with which thoughtless minds may be diverted from a tragic into a comic mood. Having reached a part of the native foot track whence both the above pas are commanded, preparations were making for the carronade to commence operations, when to the general surprise of the officers, the men ran away in a variety of directions, shouting, laughing, and hallooing, and firing as if at random, to the great danger of one another. Upon inquiry it turned out that one of them had started a pig, and that in the eagerness of their desire to hunt down the unoffending beast, they were forgetting everything besides—gun, pas, New Zealanders, and their own safety, as well as the duty in which they were engaged. It did not, however, require much exertion to restore them to order. Meanwhile I had gone forward to join Lieutenant Gunton, who headed the advanced picquet, and upon whom a firing had just opened from the farthest pa, supported with considerable spirit by a body of natives concealed in the brushwood below, or thinly scattered among the flax, which in some places grew to upwards of six feet high. In the hurry of returning their fire one of the soldiers exploded a small quantity of gunpowder and injured the palm of his hand. The picture from this spot was beautiful in the extreme.

We stood upon the Higher of two terraces, having the sea on our left hand and Mount Egmont on the right; in front of us a deep fosse surrounding the Waimate Rock, on the top of which the thickly-built town lay fully exposed to our view; beyond this a deep ravine, covered with umbrageous woods, yielded a channel for the flowing waters of a small but lovely river to wend their way to the sea-side, widening as they went, and flowing at last between the two pas; the Rangituapeka rising above the further bank of that river like some proud tower or citadel, and frowning “defiance proud and lofty scorn” upon our approach; its summit sloping towards Te Waimate, which it also overlooks, afforded us a complete insight into the arrangement of the village which occupied it, a village so picturesque as a whole, and so beautiful in all its particulars, that one wish arose in almost every mind at the same time, and that wish was to have spared it from the impending destruction.

“The last person to abdicate that pa was one whose gallant bearing elicited commendation even from those who were most loth to bestow praise in aught pertaining either to the country or people of New Zealand. This man first fired at the strangers from the top of the pa, then although a dozen balls fell close to him almost immediately after, he began stately and slowly to descend along its many terraces, facing his antagonists the while, then stooped down, loaded his gun, and fired again. A second attempt to dislodge the single opponent of a hundred foes was made by nearly all hands; but the smoke of their fire had no sooner blown past than he was seen continuing his seemingly reluctant descent to another point, where he a third time stopped to reload,

and slightly bending his body to the task, repeated his fire; then, amid a third volley from his numerous assailants, and while grape shot and canister from the carronade rained upon his path like hail and knocked up the very dust of his home about his heel, pursued his downward path as if advancing to meet and brave his opponents, and, nothing daunted, fired again, and again, and again, and each time so nicely calculating his distance from us that his every shot passed through the midst of our little band.

“The chief of Rangituapeka Pa was identical with the chief of Te Namu, both those [451] pas belonging to the Ngatiruanui tribe. Now Waiariari was the last to leave the latter place, as our hero, whose tale I have just told, was the last to leave the former. Was this man himself the chief now mentioned, and, if so, does it pertain to the condition of chieftainship to be the last in fight? Or was the noble conduct related above ascribable only to individual heroism and loftiness of character in the person merely of the dauntless Waiariari, with whose departure (and I rejoice in being able to add that he effected his escape in safety, walking over the hill at the same steady pace as he had come down from the top of his rock, and finally disappearing altogether, the last of his tribe and noblest of his race), it became evident that no one remained behind to dispute with us the possession of either place, and, accordingly, the seamen crossed the fosse and escalading the southern side of Te Waimate, hoisted the English ensign there in token to the ship of the complete success of the undertaking. The signal was soon made out by those on board and answered with a salute of two guns, which compliment was returned by

double that number from the shore. And in a few minutes after the neighbouring pa was entered by Gunton and his party.

“In quiet possession of both places, ample leisure was afforded us to examine them thoroughly, and so far as that examination afforded us with materials for reflection, to reflect upon the character and pursuits of the previous inhabitants as indicated thereby. Te Waimate itself was built upon an insular rock, not unlike Te Namu in its general form, but larger, loftier, and more difficult of access. It was excessively crowded with huts, these being generally disposed in squares, but occasionally so ranged as to form long narrow streets. Of these huts there were nearly two hundred standing when we entered the pa, varying however in their form, as it was evident they varied in their uses. In the samples they afforded of the domestic architecture of the New Zealanders, there was little remarkable when contrasted with the similar edifices of the northern tribes, except that they appeared to have been constructed with more nicety and carefulness, and with great attention to beauty of appearance. The interior of many of these houses was beautifully and even elegantly fitted, the walls, as it were, wainscotted with a row of cane running round the whole room, and divided horizontally into square compartments by ligatures of carefully twisted and plaited grass, crossing at regular distances four smoothed and polished stanchions; these again sustaining a frame-work, from which four arches sprang, to support the ridge-pole at the top, it being upheld also by three pillars, in the shape of which the first dawning of architectural embellishment is seen, they being handsomely formed and decorated with

comparatively chaste carving. Rows of cane, ranged in parallel lengths, filled up the interstices between those arches. A carpet, or perhaps I ought rather to say a bed, of dried fern leaf was carefully spread over every floor. And a small hollow, scooped out of the ground midway between the door and the centre pillar of the room, and carefully walled in and bottomed with smooth oval stones, served for a fire-place, the fuel for which hung from one of the beams or rafters, carefully tabooed by the owner of the house for his own peculiar use.'

"Dr. Marshall then goes on to describe minutely the other kinds of houses, and their varied contents—food, weapons, garments, utensils, husbandry implements, etc., etc.—taking up several pages, which, though interesting and valuable as a record of what those people *were*, I omit.

"Horrid at best is the art and practice of war, from its beginning to its close, and destructive alike of the property, interests, happiness, and lives of those whose feet are entangled therein; while, if sorrow may have place in the habitations of the blessed, if the angels in heaven know what it is to weep, the sight and hearing of what passes in the camp of even a civilized people would cause sorrow to find an entrance even there, and draw forth rivers of tears even from them. "More dreadful," said Captain Johnson to me, in the course of a conversation between us at this time, "more dreadful is the condition of that country which is the seat of war than would be the case of a land devastated by plague, pestilence or famine." A testimony not the less remarkable, because voluntarily borne by an officer who

had served many years in the Peninsula, viz., in Spain and Portugal under Wellington and against Napoleon, and shared in most of the battles fought there during the last war. Nor the less valuable, because confirmatory, without designing to be so, of the wisdom of David's choice in preferring to fall into the hands of Jehovah, and to have the kingdom plagued with three days of pestilence, or even exhausted by seven years of famine, rather than flee three months before the face of his enemies, while they pursued after him. May the choice of David be that of every one whose trust is in God, and whose hope the [452] Lord is. "Let us fall into the hands of the Lord, for His mercies are many, and let me not fall into the hands of man!"

"Extremes, as it has been proverbially expressed, meet. And in the art of war, and the military ardour to which military glory gives birth, we have the proverb wofully illustrated. The two extremes of society, its savage and its civilized states, meet at this one point—the military profession is the most honoured, and military success best rewarded in both.

"For in those days might only shall be admired,
And valour and heroic virtue call'd.
To overcome in battle, and subdue
Nations, and bring home spoils, with infinite
Manslaughter, shall he held the highest pitch
Of human glory; and for glory done
Of triumph, to be styled great conquerors,
Patrons of mankind, gods, and sons of gods
Destroyers rightlier call'd, and plagues of men.

Thus fame shall be achieved, renown on earth;
And what most merits fame, in silence hid.”—*Milton.*

“To return. Before the evening had closed we were visited by Lieutenant Thomas and Mr. Layman, midshipman, but the place chosen by them to land at was such that in doing so the boat stove, and they and the crew had to remain on shore. Several fires were lighted in different quarters of the pa for cooking, to the no small risk of all our lives; and accordingly, while the officers were conversing together in one of the huts, an alarm of fire was heard, and on looking out flames were seen issuing from more than one of the houses, and soon upwards of a dozen caught the blaze and threatened speedy destruction to all adjoining. Providentially, most providentially, the wind blew from the quarter most favourable for the preservation of the greater number of houses. An occasional explosion told of the destruction of small quantities of gunpowder, but the arms and ammunition generally were saved from the devouring elements, of whose ravages we all stood in fearful anticipation for some hours: nor was it without cause that we thus feared. Had the wind varied never so little the flames must have fed upon the houses of reeds to windward, and in that case the escape of every one now in the pa would have been but little short of a miracle. The whole ground being strewed with combustibles would have become heated like the bed of a furnace, and being everywhere undermined by a countless number of pits must have given way beneath our feet, and might have buried us in the hot ashes of the burning town. Or to avoid this peril we must have withdrawn from the pa, but how was a retreat to be effected? A great gulf yawned on

every side; two only paths offered by which to descend the precipice, on either hand one; these led along a narrow ledge of rock with a smooth perpendicular crag several feet high above and below; a false step in descending either must have led to the fall of him whose foot so erred, to be inevitably dashed to pieces upon the rocky bottom at the base of the pa. As it was, however, the mischief spread not beyond the destruction of a few huts, while no accident occurred to ourselves besides the loss of a couple of firelocks and a few boxes of cartridges. Thus mercifully did our gracious God preserve us from destruction by fire, even at the very moment when the orders which had come ashore in the gig to burn both pas was the subject of conversation, as if to entreat us, in the stead of hundreds of our fellow-creatures—including men, women and children, young and old, aged and infirm—to spare them a lodging, and not devote them to utter ruin and starvation by the consumption of all their stores of provisions, etc. But the lesson was read to us in vain, and the danger once over, our deliverance, though manifest, might almost seem to have passed unheeded, for the song of merriment mingled again with the execrations of folly and the filthy conversation of the wicked. The night passed over and the morning dawned with hardly a perceptible change in the current of men's thoughts. "O my soul, come not thou into their secret! Cursed be their anger, for it was fierce; and their wrath, for it was cruel."

"The next morning many an anxious eye was turned to the sea, but the surf along the shore was too high to admit of the troops being embarked. And here again we saw the peculiar advantage possessed by the corps of marines

over any other body of troops, in the possession of a pair of sea legs, by which expression any sailor will understand me to mean legs accustomed to stand equally sure upon the rocking sea as upon the solid land. The blue-jackets and marines of our party would have seen no difficulty in the breaking billows outside but what might easily be surmounted. The soldiers, on the other hand, would have fallen, arms and all, into the sea, in their clumsy attempts to gain the boats, and nothing, therefore, remained for us but to wait the ocean's leisure before we could look to depart in peace from a shore on which we had landed only to make war.

“Having retired from the crowd to commune with my own heart, I seated myself [453] on the brow of a rock overhanging the sea. There, while wrapt in meditation, I could see the Alligator miss stays on the very edge of a shoal, which runs out to a considerable distance, and for some minutes feared lest she had run aground, but she wore off and so a second time escaped being wrecked on this coast. As she again stood off to sea, I descended from my observatory, and visited the Rangituapeka Pa, in which Gunton and his detachment had passed the night.

“This pa was the strongest of the three that had fallen into our hands, being built at the extremity of a peninsula commanding Te Waimate and all the neighbouring country; but, on account of its great inclination towards the point at which it terminates, commanded in its turn by both. Like its fellows, it occupies a high, rocky, and triangular-shaped position, having a perpendicular face to the sea, and two very precipitous land faces. It appeared to be of more recent date than the others, and was

certainly far more beautiful. If its fortifications were not so elaborately constructed as those at Te Namu, the advantages it derived from natural causes were much greater. The space occupied by it was detached from the high land adjoining by the manual labour of the natives, who had hewed off the solid rock at a part where it was narrowest to the depth of several feet, and scarped it away on the land side to a still greater depth, and smoothed and edged the ridge at top so as to form a saddle between the country and the town which none but a madman would attempt to cross. The slope from the top of the pa to where it faces Te Waimate is considerable, but this only served to call forth the ingenuity of the natives, whose several enclosures, divided from one another by various kinds of fence, occupy as many terraces, the effect of which from without was singularly pleasing; and a visitor to the interior could not fail of deriving gratification from the freshness of the objects surrounding him and the ingenuity they betokened on the part of the inhabitants.

"In the afternoon the preserved (mummified) head of some ill-fated European was found in the trench at the back of Te Waimate, where it was supposed to have been thrown by the natives in their flight. The complexion was changed, but the features and hair remained unaltered. But, strange to say, neither Guard nor his wife nor any of his crew could recognise the face as that of one of their former companions. The sight of this head again stirred up their worst passions in some of the soldiers, and in the course of the day one of them who had straggled without leave and against orders, brought in the head of a New Zealander, which he had detached from the trunk to

which it belonged, being that of a chief whose corpse had been left on the beach where he was shot, boasting at the same time of the manner in which he had mangled what remained of the lifeless carcase. One of the marines buried this head, but it was dug up again by others, kicked to and fro like a football, and finally precipitated over a cliff among the rocks below, whence lieutenants Clarke and Gunton and myself removed it to another place, when we buried it under a large rock, and heaped over it a cairn of stones. The dead warrior had been found stretched across the beach, with his head to the rocks, his feet to the sea, his back to the ground, and his face to the sky; a musket that was neither loaded nor had been fired, clenched so firmly in his hand, that the ruffian mentioned above had to cut off the thumb of that hand before he could release the firelock from its grasp. From a little bag hung round his neck a brooch was taken, which, it is feared, identified him with the chief by whom the child had been adopted and treated with every imaginable kindness in his limited power to bestow! In this case which was the traitor, and which the betrayed?

“Here follows an elegy of twenty-five verses composed by Dr. Marshall on this mournful occasion, in which he represents the dying chief as giving vent to his feelings and comforting himself with the thoughts of what would assuredly happen in years to come. ‘Vengeance is mine, I will repay,’ saith the great judge of all. The poetry of the piece is of no mean standard, but I omit it as it is too long.

“The next day we were detained onshore still by the surf. Having strolled along the beach for the purpose of

sketching the ravine where we had passed in from the fall below, I found reason when there to be thankful that so few lives (comparatively) had been sacrificed. For the path from the beach at this spot had attracted the notice of an officer while disembarking, who pointed it out as a likely road to the native towns; but this suggestion was unheeded at the time, and hence the subsequently slow and often impeded progress of the whole party. Had we turned to the left instead of the right and made for this pass instead of for the cliff much time and no little labour would have been saved, but many more lives might, and in all probability would [454] have been lost. For it is scarcely to be supposed that, within the span which might have sufficed to conduct us to the height commanding both pas (Waimate and Rangituapeka), they would have been so entirely deserted as they afterwards were. Six persons are thought to have been slain outright here, as it did happen; six score might have fallen in the case thus mercifully prevented.

“The next morning the signal was at last made to the Alligator that the boats might approach the shore with safety, and they were accordingly sent in to convey the party off to their respective vessels; but before quitting the shore the flames were kindled in both pas, and every house having been separately fired, the whole were speedily consumed. The embarkation took up some time, but was effected, happily without an accident. A party of marines, occupying the height above the beach, covered the boats, and except a solitary straggler, visible here and there in the distance, none of the natives came in sight to witness our departure. Three seamen, having loitered behind to fetch away some baskets of potatoes from the

foot of the Waimate Pa, surprised a like number of the New Zealanders, who, deeming their enemy gone, had returned to survey the blazing ruins of their former home. One of the sailors fired at them, which so terrified the wretched creatures that they leaped from a height of nearly twenty feet into the neighbouring ditch and made their escape.

“Having yesterday received every one on board, sail was made upon the ship and a course steered for Entry Island, where we came to an anchor at nine this morning in fifteen fathoms. A low tongue of land runs out a considerable way, forming a natural pier. On this a native village has been built, and hauled up on the beach were numerous large canoes. The opposite shore was literally covered with canoes and huts, thereby warranting the belief that the tribe to which it belongs must be exceedingly numerous. Several of the natives came off to the vessel, and among others, Ropera (Te Rauparaha), the principal chief, who expressed himself well pleased when told of what we had done to the natives elsewhere; but at the same time disappointed that the number of killed was so small. He took care, likewise, to inquire why none of the dead bodies had been brought down for him to eat, and announced his intention to pay the Taranaki tribe a speedy visit for the purpose of fighting them. His appearance, conduct and character were altogether those of a complete savage; but his treatment of Europeans is described as uniformly good, and such as to encourage the resort of shipping to his place of abode. An Englishman has resided on the island for several years past as the agent of a mercantile house in Sydney and his report of the usage received by him at the hands of

Ropera is satisfactory. Covetousness appears to be that chief's besetting sin, and the indulgence of it his aim in all he does. If anyone accosted him while on board he immediately made a demand for muskets, blankets, pipes, and if denied all these, tobacco. He is said to be both a warrior and a conqueror, and to have made repeated and successful attacks upon the inhabitants of the Middle Island, multitudes of whom he has subjected to his yoke. Some of the natives here wore convict clothing, such as is used at the penal settlement at Norfolk Island, whence, on various occasions, the felons confined there have managed to escape in boats. Have these men escaped hither, and if so, what has become of them?

"We only remained a few hours at Entry Island. On leaving it we ran through Cook Strait, passing several places named by him, and experiencing variable winds and unsettled weather during our run of twelve days, we arrived in the Bay of Islands and came to off Kororareka, all hands on board glad to see the well-known place again. Every nook and corner, bay and islet, rock and promontory of this vast harbour seemed to welcome us with a smile, and were truly welcomed by us. But the pleasure of being once more at anchor at a place fondly familiar to us all, after a most weary cruise, was not a little embittered by the uncertainty attending the Isabella's fate, that schooner having parted company from us in a gale of wind two nights since, when both vessels were on a lee-shore, and only darkness brooded over the deep. We had not, however, very long to wait and watch, for near midnight on the second night after our arrival the bright glare of a burning blue-light from

some vessel entering the inner harbour told us of the Isabella's arrival, which was immediately responded to by a gun from the Alligator.

“We remained here at anchor six days, when the order for sailing was unexpectedly given. One reason assigned for sailing so hurriedly was the existence of mutiny among the soldiers of the 50th Regiment, who had procured a quantity of spirits from the dealers at Kororareka, where one of them knocked down a midshipman of the Alligator who was on [455] duty. Some of the men were afterwards brought to a court martial at Sydney, but the result had not transpired before we sailed thence. The men who formed that detachment were certainly as ill-disciplined a body as I had ever done duty with, but much may be said in extenuation of this. Most of them had arrived in small separate parties within the current year from England, and only a few had been any time in the army, fewer still with their regiment at home. The whole company had hardly been completed at Sydney when ordered on the expedition to Cape Egmont, and were just landed there when summoned to re-embark. On board the schooner it would have required talents for command of the first order to subject them to strict discipline, and after two months at sea, during which they were subject to many privations, it can be no matter of surprise, however much of regret, that they fell before the temptation, and, under the maddening effects of strong drink, forgot they were soldiers, having previously forgotten that they were men.

“In the preceding narrative I have endeavoured to relate events in the exact order of their occurrence, leaving

facts to speak for themselves, and principally solicitous of putting true facts on record, for all facts are not true, seeing that some things are said to be facts that never had any existence at all, except in the imagination of the narrator, or in the credulity of the retailer. And some facts are so stated, as to be what Dr. Cullen calls false facts, either by the omission of something that happened, which, if added, would alter their character, or by the addition of something that never happened, which from being added to that which did happen, changes truth into falsehood; the one producing the effect of wrong perspective, the other of faulty colouring or distortive caricature. To the truth of the facts as stated in my narration, so far as they fell under my own observation, the publicity which I now give to them pledges me both as an officer and a gentleman, and much more as a Christian. For the correctness of any opinions interwoven with those facts I do not pledge myself; my readers will be competent to detect any fallacies in my reasoning, and need not yield themselves to my judgment, although they will in justice and courtesy rely upon my testimony until it be contradicted.

“In reviewing the whole affair, it is impossible, however, to close one’s eye upon the errors of judgment which attended our expedition, any more than upon the complete success by which its operations were rewarded.

“The first question which obtrudes itself is obviously this: Why was His Majesty’s ship Alligator, assisted by a detachment of soldiers, sent to New Zealand to act at all against the natives, without reference to, or the counsel of, His Majesty’s accredited representative in that

country? And this, too, in the teeth of the Secretary of State's recent official letter to the chiefs, introducing Mr. Busby, concerning whom Lord Goderich writes thus to them: "In order to afford better protection to all classes, both natives of the Islands of New Zealand and British subjects who may proceed thither, or be already established there for purposes of trade, the King has sent the bearer of this letter, James Busby, Esq., to reside amongst you as His Majesty's Resident, whose duties will be to investigate all complaints which may be made to him, etc."

"Again, it cannot fail to be matter of deep surprise, as it ought ever to be a subject of sincere regret, that the expedition when sent was so inadequately provided with interpreters. Mr. Battesby's only knowledge of the tongue in which he was appointed to communicate on a question of life and death had been acquired on Kororareka Beach [now Russell, Bay of Islands]. While his qualifications for the delicate office of an interpreter, both moral and literary, had been obtained while filling the somewhat different situation of a retail spirit seller and marker of billiards at the same place.

"Thirdly, having a Resident in their country, having provided the people with a flag, having paid national honours to that flag as the standard of an independent nation, albeit a nation of savages, ought we not, in our national capacity, to have had respect to the laws and usages of the New Zealanders, and prior to making a peremptory demand for the release of their, it might be, lawful prisoners, and that too without the ransom they affirmed themselves entitled to (a demand becoming well

our power, but of very doubtful propriety if taken in connection with our right to make it, and to make it, too, at the point of the bayonet), ought not some negotiation to have been entered into, some inquiry to have been made as to the right of those natives, agreeably to their own laws, to demand such ransom even when too weak to enforce its payment?

“O, it is excellent
To have a giant’s strength, but it is tyrannous
To use it like a giant.”—*Shakespeare*. [456]

“The British Resident ought to have been applied to to become the organ of communication between the Government of New South Wales and the New Zealanders at Cape Egmont. A competent interpreter of unimpeachable veracity might have been obtained either from the Church Mission, in Mr. Busby’s own immediate neighbourhood, Paihia, or from the settlement of the Wesleyan Mission at Hokianga; and, if not for the ungracious, undutiful, and hardly loyal purpose of acting under the King’s authority in direct contradiction of the King’s word pledged to the chiefs of New Zealand, a purpose which I am far from attributing to the Colonial Government of New South Wales, it is difficult to understand why there was nothing like inquiry or preliminary negotiation—unless the *ex parte* statement of John Guard be inquiry—respecting the particulars attending the loss of the Harriet, seeing that such inquiry might have elicited some truth necessary to be known, and that such negotiation might have placed any ulterior proceedings, however severe, upon the sure basis of justice and moderation.

“Of the errors committed in the execution of the affair I have occasionally made mention in the course of my narrative. They consisted mainly in exacting too much from the natives, and yielding too little; in acting rather according to momentary impulses than upon a set of fixed principles; in treating the New Zealanders as savages, and forgetting that they were, notwithstanding, men; in inflicting wrong upon them, and making no reparation; while suffering neither actual nor imaginary wrong from them, without inflicting summary vengeance. In hazarding which opinion I put out of the question altogether the private and unofficial, though grievous injuries done to Whiti at Te Namu, to the natives when the firing first commenced, and to the dead body of the chief whose head was so inhumanly converted into a tennis ball for the sport of private soldiers, and refer only to the public acts of public men, acting in a public capacity, which are and ought always to be public property. Looking to those acts it is impossible not to censure the breach of faith at Moturoa, the refusing to give the natives what they had been promised for a very essential benefit conferred; to the forcible seizure of Whiti, and the imprudence of committing him to the custody of bitter personal enemies; to the savage cannonading of two villages, crowded with a mixed multitude of men, women, and children; and to the gratuitous and crowning cruelty of burning the habitations, destroying the defences, and consuming the provisions and fuel laid by in store for many coming months, of upwards of a thousand miserable wretches; and that, in the case of the last two towns that were burnt, after resistance had ceased, and,

forsooth! *because* merely resistance had been offered at all by an independent people to an unwarranted attack upon their lives and properties; and, moreover, after every object proposed by the expedition in the New South Wales Council itself had been fully accomplished, and without injury of any sort to us, and almost without accident of any kind.

“What effect the operations previously detailed may have upon the subsequent relations of the two tribes so severely punished, or upon the future intercourse of Europeans with the coast on which we made such hostile descents; whether the tribes in the neighbourhood of the Taranaki and Ngatiruanui people will come down upon them in their crippled and houseless condition, war with, and enslave, or destroy them altogether; or whether they may be able to strengthen their weakness by a defensive alliance with some of their neighbours, time alone can discover, and time will certainly tell. It is greatly to be feared that the former will be the case, for they possess powerful and hitherto implacable enemies in the Kapiti (Entry Island) and Waikato tribes, whose aggressions in times past they have hardly been able to repel, and by whom they are in present peril of being cut off, unless, indeed, they should find time, before the return of their ancient foes, to reconstruct their overthrown fortresses and rebuild their demolished towns, when it is thought they may be able to recruit their numbers by a junction with the Ngatiawa tribe who have recently sustained an assault from the Waikato natives. As regards their future visitors from the Australian colonies, woe to the crew of any vessel hereafter to be shipwrecked on their coast. Even fools are taught by experience, and however

ignorant the New Zealanders may be, they are certainly no fools. The experience they have acquired by our recent visit may teach them that if Europeans fall into their hands it is not consistent with their own safety that any should escape alive to complain of ill-usage, and bring down upon them an armed force, compounded of naval and military men, from New South Wales. It remains to be seen whether they will be content to wait till the winds and waves [457] convey victims to their shore for slaughter, or whether they will not rather choose to wreak speedy vengeance upon the crew of the first vessel that may venture near to trade with them.””

Mr. Colenso continues:—

“Thus far Dr. Marshall, whose own words, without addition or alteration, I have uniformly quoted, although I have (in a few places) omitted largely, as already mentioned. As may easily be supposed, Dr. Marshall, writing too at a time when so little of a reliable nature was known of the New Zealanders, gives very much of other information respecting them that is both truthful and interesting, which he also supplements with many sound and useful remarks; but such are far too extensive for introduction here. Nevertheless, from his concluding remarks I make the following extracts, (1) because they are so truthful, and so faithfully and eloquently written; (2) because I myself, after a long experience in New Zealand, fully agree with Dr. Marshall in them, and therefore add my testimony to them; and (3) because those words—written more than fifty years ago—were but the prologue, as it were, to the sad and thrilling tragedy which has ever since been daily acting here in

New Zealand.

“Dr. Marshall says: ‘Navigation, commerce, and trade brought their influences early into operation in this savage country, and were thus trying an experiment upon the minds of the New Zealanders. To the astonishment of those who were for civilisation to be the forerunner of evangelisation, navigation did no more for New Zealand than it had done for all the world beside, namely, make known its situation and extent to the civilised nations of the earth, and open the way for commerce to improve upon the discovery. Commerce was not slow to follow in the way thus opened to her, and the spacious harbours of New Zealand enabled her shipping to prosecute the pursuit of wealth with a widening prospect of success, by enabling them to make more strenuous efforts, and to continue them longer, in seas so remote from Europe. But, beyond thinning the forests of its stately inhabitants, and propagating among the natives a filthy and terrible disease, commerce, while returning enriched herself from the ports of New Zealand, left the country unimproved by her visitations, and its aboriginal tenantry not a little injured by her importations.

“If navigation only ascertained for these islands their geographical positions, the utmost that commerce can be said to have done, is the discovery of their value, and the partial development of their resources, with a display of which to invite trade to add to her inventory the productions of the soil of New Zealand. Trade, never indolent when wealth was the sure reward of industry, landed with her wares among a people of savages; she brought them muskets and gunpowder because they

delighted in war; she sold them tobacco and gin because from the use made of these articles by their visitors, they esteemed them luxuries, and partook of them till they became necessities. For the former she received in exchange the heads of murdered men; for the latter she obtained lands and forests, and flax, the last an article of considerable value everywhere but in New Zealand. But trade was too busily employed in taking care of herself to care for the natives by whose property she flourished and on whose vitals she fed; her footsteps in the land left indeed their stamp behind them, but for that stamp her presence might be unsuspected—a thinning of the tribes, the almost depopulated shores of New Zealand, leave room enough for the most cursory observation to detect the impressions of her feet. Misery, disease, and death remain where she trafficked. I say not that the natives were not previously subject to these accidents of our human nature, for they are evils to which all flesh is heir, but facts, undeniable facts, bear me out in affirming that misery unheard of before, diseases unknown before, and deaths made fearfully more numerous than, and of a kind unthought of before, have been introduced with the introduction of trade among a people who owe no debt of gratitude whatever to trade, however she may have increased in value and in bulk the contents of her warehouses and the sales in her markets by the productions of a foreign soil, sometimes forcibly, and at other times fraudulently and by surreptitious means obtained from the rightful owner; although I am free also and glad to confess frequently procured by fair and equitable dealings. Trade and commerce and navigation have succeeded and combined with one another upon

New Zealand ground. They have improved by the adventure and benefited themselves and their promoters, *but New Zealand they have neither directly benefited nor improved.*'

"Here, then, I end my pleasing yet mournful task of bringing forward the words of my dear deceased friend, Dr. Marshall. Of them—of him—I think I may truly say, 'he being dead, yet speaketh.' Very likely in [458] days yet to come much more will be thought of his own words than at present.

"Before, however, that I entirely quit my subject, I would offer a few remarks of my own upon portions of what I have written. And, first, I would briefly quote from Dr. Dieffenbach's work on New Zealand, who was himself a visitor in New Zealand, and a sojourner for some considerable time in those very places on the west coast of the North Island within six years after Dr. Marshall's visit thither in the *Alligator*. I knew Dr. Dieffenbach well, and I have no reason to suppose that he knew anything of Dr. Marshall, or of what he had written. Dr. Dieffenbach, however, mentions very feelingly the series of sufferings and losses and deaths which those poor unhappy tribes of New Zealanders who dwelt on that coast subsequently suffered, year after year, from their numerous and powerful and deadly foes. And he also says: 'There are still natives at Te Waimate, which is known as the place where, on the shipwreck of the barque *Harriet*, a fierce struggle ensued between the natives and Europeans, in which several men were killed on both sides. Although this conflict, according to all the accounts I could collect, was caused by the Europeans,

His Majesty's vessel Alligator afterwards inflicted a severe and summary punishment on the natives.' I should also state that with Dr. Dieffenbach on this occasion were some of those very resident Europeans whom John Guard knew and referred to.

"Second, I would observe that it was a national custom—indeed, a law—of the New Zealanders to appropriate all salvage from wrecks, even when of their own tribe; and such, being a law among themselves, and universally carried out and always expected, was never resisted or found fault with. To this we may rightly enough demur; but let us just look at home among the good Christians of Britain in the nineteenth century, and note the heavy, excessive, unjust demand almost invariably made for salvage, and consequently brought into the law courts."

1890 The authentic and genuine history of the signing of the Treaty of Waitangi, New Zealand, February 5 and 6, 1840: being a faithful and circumstantial, though brief, narration of events which happened on that memorable occasion; with copies of the Treaty in English and Maori, and of the three early proclamations respecting the founding of the Colony.

Wellington, Government Printing Office. 42p.

“Quæquaæ ipse vidi, et quorum fui” —Virg.⁶⁴⁵

While silence is truly golden, Facts speak loudly and significantly.

PREFACE.

IT has been said, “That country is the happiest which has no history,” which saying, while pretty generally accepted as a kind of truism, may yet be doubted, if not disputed: at all events, such a statement, however applicable to any one of the ancient countries of the world, can scarcely be received with reference to a modern colony whose birth and beginning are known. Be that as it may, the present seems a very opportune time for the publication of the principal portion, at least, of the following pages, seeing that this Colony of New Zealand is on the eve of celebrating the jubilee of its foundation,

645 That which I have seen and of this I am a part. Virgil (*Aeneid*).

dating the same from the signing of the Treaty of Waitangi, on the 6th February, 1840.

Moreover, the writer of the following *résumé* of occurrences that happened at that time—who also took part in them, and wrote them down on the spot while fresh in memory—is also the writer of this, and is, as far as he knows, the only one [6] still remaining of that little British band who alike strove loyally and patriotically to do their level best on that important occasion. It also occurred to him that—as no special account of what then took place had ever been published, and as the narration he had written was both authentic and genuine and particularly well-attested, and the only (known) one ever made—he should seek to make it known to his fellow-colonists; and therefore, while casting about how the better to accomplish this, he applied to the Government of the colony to publish his MSS., deeming them, though brief, to be not merely interesting, but also of a colonial, if not of a national, importance, especially in days to come ; and the Government have consented to do so. [7]

INTRODUCTION.

BEFORE the writer enters on the subject of the following pages, he thinks it right to inform his readers why it became written in the manner it is, and how two persons wholly disassociated came to unite in supporting it.

First: It was thus written in its present condensed form by the writer, from notes taken at the time, for the secretaries of the Church Missionary Society, London. It will be seen that he was not only present, but had a little

to do on that occasion, also, both before and after it, in his then more particular vocation in the printing-office of the Church Mission at Paihia, near Waitangi, of which he was the printer and superintendent, but without any assistants. And here he may further observe that had he not been so closely worked at that time (both for the newly-established Government and the mission), with out any assistant and under many peculiar disadvantages, his MS. would have been much larger. And it Was solely owing to his many heavy and pressing duties that he did not attend the great public meeting held two days after at Kororareka (now Russell), when the foundation of the newly-formed colony was duly proclaimed with the usual demonstrations of show and ceremony. This also accounts for the non-appearance of his name among those of the Europeans who signed as witnesses on that occasion.

Second: Mr. William Richard Wade, hitherto a member of the Church Mission, was about to leave both it and New Zealand, with his wife and family, to reside in Tasmania. Mr. Wade and the writer had come out [8] together as missionaries in the same ship to New Zealand, and had always been on the most intimate terms. Mr. Wade had also, formerly, in London, been in the employ of the Church Missionary Society, in their Mission-house in Salisbury Square, as one of their secretaries, and was a trustworthy and very clear writer. He had lived at Te Waimate down to the time of his leaving New Zealand, but was not able to attend the great meeting at Waitangi, and therefore the writer gave him his MS., open, to read during the voyage and (if he should have time) to copy for the Church Missionary

Society. This he did, and so the MS. was returned to the writer, minus the printed appendices—of which, however, there were still a few spare copies remaining. In those days, and for long after, our correspondence with England generally went by the way of Sydney. It may further be briefly mentioned that Mr. Wade, after living several years in Tasmania (Hobart Town) as a Baptist minister and teacher, died there some years ago. He wrote and early published there a small but interesting volume of his "Journey in New Zealand."

Third: Mr. James Busby, formerly and for many years the British Resident in New Zealand (his official position terminating on the arrival of the Lieutenant-Governor, Captain Hobson, R.N.), was also leaving New Zealand with his family for Sydney by the first ship thither. Mr. Busby and the writer were also very intimate. A ship having at last arrived in the Bay of Islands bound for Sydney (the "Eleanor," Captain W.B. Rhodes, a gentleman long afterward known in this colony as one of its early and energetic settlers, and filling several high political situations), passages were taken by her for both Mr. Busby and Mr. Wade and their families, and on the 25th March the writer accompanied Mr. and Mrs. Busby on board; Mr. Wade subsequently embarking from the mission-station at Te Puna, on the farthest north side of the bay.

Fourth: During the passage to Sydney Mr. Busby read the said MS., which he had not previously seen, and also added a few valuable notes, which the writer has faithfully [9] copied (*ipsissima verba*), inserting them where Mr. Busby had placed them. And this, in the

writer's opinion, has rendered this little narration of those circumstances doubly valuable as a historical reminiscence of what then really took place, the same being now attested by two capable witnesses, acting independently, yet agreeing in the relation.

The writer has also availed himself of this opportunity of laying before his readers copies of the treaty in English and in Maori, and also of the three early and chief Proclamations relating to the foundation of the colony.

POSTSCRIPT.

Were the writer now and for the first time to leisurely write (from his old original notes) a relation of what took place at the signing of the treaty, he should, no doubt, make some alterations (possibly improvements) in the language and style used in a few places. But on consideration he has decided not to alter it in any instance, so that the narration should stand as Mr. Busby read it, and with his full acquiescence in its correctness. For this reason, also, the old and early mode of writing Maori (the not using the wh character, &c.) has been retained. And this last also applies to all the Maori papers herein published in the appendices. [10]

HISTORY OF THE SIGNING OF THE TREATY OF WAITANGI.

MEMORANDA of the Arrival of Lieut.-Governor Hobson in New Zealand, and of the Subsequent Assembling of the Native Chiefs at Waitangi, in the Bay of Islands, the Residence of the late British Resident, James Busby, Esq., on Wednesday and Thursday, the 5th and

6th days of February, 1840, for the Purpose of meeting His Excellency.

1840, *January 29th*.—This morning Her Majesty's ship "Herald," Captain J. Nias, arrived in the Bay of Islands and anchored in the harbour, having on board Lieut.-Governor Hobson and his suite.

30th.—Early this morning circular letters were printed at the press of the Church Missionary Society for the assembling together of the Native chiefs at Waitangi, to meet the newly-arrived Governor, on Wednesday next, the 5th day of February. Two Proclamations were also issued by the Governor—the first stating that he had been appointed Lieutenant-Governor over any territory which is or may be acquired in sovereignty by Her Majesty within the Islands of New Zealand, and that this day he entered on his office; the second stating that Her Majesty does not deem it expedient to recognise as valid any titles to land in New Zealand which are not derived from nor confirmed by Her Majesty; and that all purchases of land in any part of New Zealand made after the date of this Proclamation [12] will be considered as absolutely null and void, and will not be confirmed or in any way recognised by Her Majesty.

In the afternoon the Governor landed at Kororareka, and walking to the church there belonging to the Church Mission (the only large building), publicly read his Letters Patent and his two Proclamations.

Wednesday, February 5th.—This morning at an early hour, the Natives, who had been gathering together all day yesterday, began to move towards Waitangi, the appointed place of meeting. About 9 a.m. the Lieutenant-

Governor, accompanied by the captain of the "Herald," arrived at Waitangi; and from 9 to 10 a.m. the officers of the man-o'-war, the suite of the Governor, all the members of the Church Mission residing in or near the Bay of Islands, together with different European and American residents and settlers, kept arriving. The day was particularly fine, and the spectacle of the most animated description. On the water were to be seen the numerous canoes gliding from every direction towards the place of assembly, their respective rowers straining every nerve to gain and keep the lead, whilst their paddles kept time with the cadence of the canoe-song of the *kai-tuki* (canoe-song singer), who, standing conspicuously erect in the midst of each canoe, and often on the thwarts, animated the men by his gestures as well as his voice; the boats of the many settlers and residents living on the shores of the bay, together with those from the different ships and vessels at anchor in the harbour; and the ships and vessels decorated with the flags of their respective nations. On shore, in the centre of the delightfully-situated lawn at Waitangi, a spacious tent was erected, which was tastefully adorned with flags, &c., &c., over which England's banner streamed proudly in the breeze;⁶⁴⁶ the whites, many of whom were newcomers, who seemed to be much delighted with the scene before them, were comfortably walking up and down in different little parties, socially chatting with [13] each other *à l'Anglais*; whilst the countenances and the gestures of the Natives, who were squatting grouped

646 WC: The flag was taken down while the proceedings were going forward.—J.B.

together according to their tribes, bore testimony to the interest which they took, if not in the business, in the gaiety and life of the day. Nature appeared for once to have consented to doff her mantle of New Zealand grey,⁶⁴⁷ and to have become quite exhilarated. Even the *cicadæ*, those little gallant monotonous-toned summer gentlemen, sang livelier than usual. Everything, in fact, wore the appearance of cheerfulness and activity. Whilst all this was exhibited and enjoyed without, the Lieutenant-Governor, Mr. Busby, and Rev. H. Williams were engaged within, translating the treaty, and arranging other preliminary matters for the meeting. About half-past ten a.m. the French Roman Catholic Bishop Pompallier, dressed in canonicals, attended by one of his priests, arrived. They landed, and walked onwards, without the least hesitation, into the room in Mr. Busby's house where the Lieutenant-Governor and others were closely and privately engaged, brushing by the [mounted] police,⁶⁴⁸ who, in uniform, were keeping guard before the door. At this a buzz might be heard among the Natives, one saying to another, "Ko ia ano te tino rangatira! Ko Pikopo"⁶⁴⁹ anake te hoa mo te Kawana" (*i.e.*, "He, indeed, is the chief gentleman! Pikopo (Pompahlier) only is the companion for the Governor"). Hearing the observations

647 WC: Mr. Busby has here, in the margin of the MS., "?,J.B." My allusion was to the rather sombre appearance of the fern, and *manuka* (*Leptospermum scoparium*) scrub, and rushes, on the barren hills around.

648 WC: A small body of them had accompanied Captain Hobson from Sydney.

649 WC: The common Maori name by which the Roman Catholic bishop and the priests were known.

made by the Natives, I repeated them to my brethren, Messrs. King, Kemp, Clarke, and Baker, at the same time calling their attention to what had just taken place, saying, "If Pikopo and his priest go in, we, for the sake of our position among the Natives, should go in also." To which the brethren assenting, we walked on towards the house. [14] Just as we had gained the verandah an invitation was announced from the Lieutenant-Governor for all those who had not and who wished to be presented to him to come in through one door, be presented, and then pass out through the other. On this some of the brethren were going in with the settlers and residents, who were pressing forward, when I said, "I pray you do not go in and out in this manner while Pikopo and his priest remain in the room." On which they all, with myself, remained without. After the several persons who had entered had been introduced, which was soon done, the Lieutenant-Governor came out to proceed to the tent, His Excellency, the captain of the "Herald," and Mr. Busby, preceded by some of the [mounted] police, leading the way; on which the Roman Catholic bishop and his priest stepped briskly up close to the heels of the Governor, so shutting us out unless we chose to walk behind them. "Brethren," I exclaimed, "this won't do: we must never consent to this position." "No," rejoined the Rev. R. Taylor; "I'll never follow Rome." And on his so saying we stepped on one side, out of the line of procession. Arriving at the tent, the Governor and captain took their seats in the centre of a raised platform, when Pikopo and his priest immediately took possession of the

seats on the left next to the Governor,⁶⁵⁰ we, the Church of England missionaries, standing behind. The Rev. H. Williams was now directed to a chair placed on the Governor's right, on which the Colonial Secretary, Mr. Willoughby Shortland, came over to us, took me by the sleeve, and said, "Go over to that end and support your cloth"—an intimation we lost no time in attending to, ranging ourselves as we best could behind the Rev. H. Williams. The tent was all this time rapidly filling with the different persons assembled. The scene was very interesting and impressive. In the centre of the narrow raised platform were the Governor and [15] captain of the man-o'-war in full uniform; on the Governor's left were Mr. Busby, and the Roman Catholic bishop in canonicals, his massy gold chain and crucifix glistening on his dark-purple-coloured habit; on the right of His Excellency were the members of the Church of England mission, in plain black dresses. The different officers of the "Herald," together with His Excellency's suite, stationed themselves as they best could—some here and there on the platform and some immediately before it. In front of the platform, in the foreground, were the principal Native chiefs of several tribes, some clothed with dogs'kin mats made of alternate longitudinal stripes of black and white hair; others habited in splendid-looking new woollen cloaks of foreign manufacture, of crimson, blue, brown, and plaid, and, indeed, of every shade of striking colour, such as I had never before seen in New Zealand;⁶⁵¹ while

650 WC: Mr. Busby was on the Governor's immediate left, and the Roman Catholic bishop next to him.—J.B.

651 WC: The gifts of the Roman Catholic bishop.—J.B.

some were dressed in plain European and some in common Native dresses. Nearly in the midst stood Hakitara, a tall Native of the Rarawa Tribe, dressed in a very large and handsome silky white *kaitaka* mat (finest and best kind of garment, only worn by superior chiefs), fringed with a deep and dark-coloured woven border of a lozenge and zigzag pattern, the whole of Native (I might truly say of national) design and manufacture.⁶⁵² The sunlight streaming down from an aperture in the top of the tent on this beautiful white dress threw the figure of this chief into very prominent and conspicuous relief, forming a fine contrast to the deep and dark shades of colour around; whilst here and there a *hani* (or *taiaha*, a chief's staff of rank, &c.) was seen erected, adorned with the long flowing white hair of the tails of the New Zealand dog and crimson cloth and red feathers. In the distance the raven-black and glossy locks of the Natives, gracefully ornamented with the snow-white [16] and drooping feathers of sea-birds and of the white crane, forming a striking contrast, added much to the *tout ensemble*. Around the sides of the tent were the whites, residents and settlers, by far the greater part being very respectably dressed; and outside of them, against the walls of the tent, were flags of different nations, which, from the vividness of their colours, especially when the sun shone brightly on them, gave a charming air of liveliness to the whole.

652 WC: This garment was afterwards much admired and talked of by the Natives themselves. I have only seen one similar one, which I early (in 1836) had obtained from Rotorua.

A few little matters having been adjusted, the Governor arose, and, addressing himself briefly to the whites, said that the meeting was convened for the purpose of informing the Native chiefs of Her Majesty's intentions towards them, and of gaining their public consent to a treaty now about to be proposed to them. He then addressed himself to the Natives, in English, as follows, the Rev. H. Williams acting as interpreter:—

“Her Majesty Victoria, Queen of Great Britain and Ireland, wishing to do good to the chiefs and people of New Zealand, and for the welfare of her subjects living among you, has sent me to this place as Governor.

“But, as the law of England gives no civil powers to Her Majesty out of her dominions, her efforts to do you good will be futile unless you consent.

“Her Majesty has commanded me to explain these matters to you, that you may understand them.

“The people of Great Britain are, thank God! free; and so long as they do not transgress the laws, they can go where they please, and their sovereign has not power to restrain them. You have sold them lands here and encouraged them to come here. Her Majesty, always ready to protect her subjects, is also always ready to restrain them.

“Her Majesty the Queen asks you to sign this treaty, and so give her that power which shall enable her to restrain them.

“I ask you for this publicly: I do not go from one chief to another. [17]

“ I will give you time to consider of the proposal I shall now offer you. What I wish you to do is expressly for your own good, as you will soon see by the treaty.

“ You yourselves have often asked the King of England to extend his protection unto you. Her Majesty now offers you that protection in this treaty.

“ I think it not necessary to say any more about it. I will therefore read the treaty.”

Here His Excellency read the treaty in English, and the Rev. H. Williams read the translation of the same, which had been prepared in the New Zealand language, to the Natives.

The treaty having been publicly read in English and in the Native tongue, liberty of speech was granted to any one who felt inclined to speak on the subject, or to make any inquiry relative to the same.

Some brief preliminary proceedings followed, during which Mr. Busby addressed the Natives to the effect that the Governor was not come to take away their land, but to secure them in the possession of what they had not sold; that he (Mr. Busby) had often told them that land not duly acquired from them would not be confirmed to the purchaser, but would be returned to the Natives, to whom it of right belonged; that this the Governor would be prepared to do. Suddenly,

Te Kemara, a chief of the Ngatikawa, arose and said, “ Health to thee, O Governor! This is mine to thee, O Governor! I am not pleased towards thee. I do not wish for thee. I will not consent to thy remaining here in this country. If thou stayest as Governor, then, perhaps, Te

Kemara will be judged and condemned. Yes, indeed, and more than that—even hung by the neck. No, no, no; I shall never say ‘Yes’ to your staying. Were all to be on an equality, then, perhaps, Te Kemara would say, ‘Yes;’ but for the Governor to be up and Te Kemara down—Governor high up, up, up, and Te Kemara down low, small, a worm, a crawler—No, no, no. O Governor! [18] this is mine to thee. O Governor! my land is gone, gone, all gone. The inheritances of my ancestors, fathers, relatives, all gone, stolen, gone with the missionaries. Yes, they have it all, all, all. That man there, the Busby, and that man there, the Williams, they have my land. The land on which we are now standing this day is mine. This land, even this under my feet, return it to me. O Governor! return me my lands. Say to Williams, ‘Return to Te Kemara his land.’ Thou” (pointing and running up to the Rev. H. Williams), “thou, thou, thou bald-headed man—thou hast got my lands. O Governor! I do not wish thee to stay. You English are not kind to us like other foreigners. You do not give us good things. I say, Go back, go back, Governor, we do not want thee here in this country. And Te Kemara says to thee, Go back, leave to Busby and to Williams to arrange and to settle matters for us Natives as heretofore.”

This chief spoke in his energetic, peculiar manner, as if very angry; his eyes rolling, and accompanying his remarks with extravagant gestures and grimace, even for a Native. The officers of the man-o'-war, and all strangers, were wonderfully struck with his show of himself. To any one unacquainted with New Zealand oratory it is morally impossible to convey a just idea of his excited manner, especially when addressing himself

to Mr. Busby and to the Rev. H. Williams on the subject of the land.⁶⁵³

Rewa, chief of the Ngaitawake Tribe, arose, and said (his first short sentence being in English), "How d'ye do, Mr. Governor?" which, unexpected as it was, set all hands a-laughing. "This is mine to thee, O Governor! Go back. Let the Governor return to his own country. Let my lands be returned to me which have been taken by the missionaries—by Davis and by Clarke, and by who and [19] who besides. I have no lands now—only a name, only a name! Foreigners come; they know Mr. Rewa, but this is all I have left—a name! What do Native men want of a Governor? We are not whites, nor foreigners. This country is ours, but the land is gone. Nevertheless we are the Governor—we, the chiefs of this our fathers' land. I will not say 'Yes' to the Governor's remaining. No, no, no; return. What! this land to become like Port Jackson and all other lands seen [or found] by the English. No, no. Return. I, Rewa, say to thee, O Governor! go back."

Moka, chief of the Patuheka Tribe, arose and said, "Let the Governor return to his own country: let us remain as we were. Let my lands be returned to me—all of them—those that are gone with Baker. Do not say, 'The lands will be returned to you.' Who will listen to thee, O Governor? Who will obey thee? Where is Clendon?"

653 WC: And yet it was all mere show—not really intended; as was not long after fully shown, when they gave their evidence as to the fair sale, &c., of their lands before the Land Commissioners, I myself acting as interpreter.

Where is Mair? Gone to buy our lands notwithstanding the book [Proclamation] of the Governor."

On this being interpreted to the Governor, His Excellency said "that all lands unjustly held would be returned; and that all claims to lands, however purchased, after the date of the Proclamation would not be held to be lawful." This was also interpreted to Moka by the Rev. H. Williams; when

Moka rejoined, "That is good, O Governor! that is straight. But stay, let me see. Yes, yes, indeed! Where is Baker? where is the fellow? Ah, there he is—there, standing! Come, return to me my lands." This he addressed to Mr. Baker, coming forward as near as he could to the place where Mr. Baker was standing on the raised platform, and looking up, waiting for a reply. To which question Mr. Baker quietly replied, "E hoki, koia?" —equivalent in English to, "Will it, indeed, return?" On which Moka continued, "There! Yes, that is as I said. No, no, no; all false, all false alike. The lands will not return to me."

At this juncture a white man came forward, and, [20] addressing His Excellency, said that the Native speeches were not half interpreted by Mr. Williams, neither were His Excellency's remarks fully interpreted to the Natives; that a Mr. Johnson⁶⁵⁴ was present who could interpret well, &c.

The Governor: "Then, pray, Mr. Johnson, do me this great favour and come forward and interpret for me. I am

654 WC: Johnson was an old resident (dealer in spirits, &c.) of Kororareka.

anxious that the Natives should know what I say, and also that I should know what they say. Mr. Johnson, do you fully understand the Native language?"

Johnson, (coming forward): "Why, I can't say I do, but I know how to speak to them, and know also what they say when they speak to me; and" —

The Governor: "Then pray tell me what Tins not been interpreted."

Johnson : "No, Sir, I beg to be excused. The gentlemen of the mission ought to be able to do it, and can do it very well; only let Mr. Williams speak out loud so that we may hear—we here in the back part of the tent; and let all that the Natives say be interpreted to the Governor. They say a great deal about land and missionaries which Mr. Williams does not translate to you, Sir," &c.⁶⁵⁵ The Rev. Henry Williams, having obtained permission of His Excellency, addressed the whites in English, and said, "A great deal has been said about the missionaries holding land, and their farming, and what not; but the Commissioners who are about to sit will examine into the lands held by the missionaries, and their titles thereto, as strictly as into any other. I wish for this to be done, and I have already applied to His Excellency for the lands in the possession of the missionaries to be first brought before the Commissioners. People should recollect that were it not for the missionaries they would not be here this day, nor be in possession of a foot of land in New Zealand [21]. If any one person has a prior claim to land

655 WC: This can only refer to their immense amount of repetition: otherwise Mr. Williams translated fairly what they said.

in this country, that person must be the missionary, who had laboured for so many years in this land when others were afraid to show their noses. I have a large family—a family of eleven children—more, probably, than any one present; and what are they to do when I am taken from them if they are not to have some land? Much has been said about my land, but I believe that when it is seen and known, and shared up between my children, no one will say that I have been over the mark, but, on the contrary, under. All I shall say at present is, I hope that all who hold lands obtained from the Natives will be able to show as good and as honest titles to the same as the missionaries can do to theirs.”

Mr. Busby, having also obtained permission of His Excellency to speak a few words to the whites on his purchasing of land, rose and said in English, “I deny that the term ‘robbed’ has been used by the chiefs Te Kemara and Rewa with reference to my purchase of land, as indicated by the white man who spoke, and coupled by him with Mr. Williams by gestures, though not plainly by name. I never bought any land but what the Natives pressed me to buy, for which I always paid them liberally. Allusion has been made to my possessing large tracts of land: I am happy to say that I do hold some land; but I did not make any extensive purchase until I was out of office, and then, on my finding that, after having served the Government for fifteen years, not any provision was made, nor was likely to be made, for myself and my family, I purchased land. I only regret that I had not done so at an earlier period, and that to a larger extent. In all my purchases, also, I have reconveyed to the Natives both habitations and cultivations, by an

unalienable deed of gift, according to the number of persons thereon."

Tamati Pukututu, chief of Te Uri-o-te-hawato Tribe, rose and said, "This is mine to thee, O Governor! Sit, Governor, sit, a Governor for us—for me, for all, that our lands may remain with us — that those fellows and creatures who [22] sneak about, sticking to rocks and to the sides of brooks and gullies,⁶⁵⁶ may not have it all. Sit, Governor, sit, for me, for us. Remain here, a father for us, &c. These chiefs say, 'Don't sit,' because they have sold all their possessions, and they are filled with foreign property, and they have also no more to sell. But I say, what of that? Sit, Governor, sit. You two stay here, you and Busby—you two, and they also, the missionaries."

Matiu, a chief of the Uri-o-ngongo Tribe, rose and said, "O Governor! sit, stay, remain—you as one with the missionaries, a Governor for us. Do not go back, but sit here, a Governor, a father for us, that good may increase, may become large to us. This is my word to thee: do thou sit here, a father for us."

Kawiti, chief of the Ngatihine Tribe, rose and said, "No, no. Go hack, go back. What dost thou want here? We Native men do not wish thee to stay. We do not want to be tied up and trodden down. We are free. Let the missionaries remain, but, as for thee, return to thine own country. I will not say 'Yes' to thy sitting here. What! to be fired at in our boats and canoes by night! What! to be

656 WC: "Piritoka," and "piriawaawa." —words of deep metaphorical meaning: *anglice*, homeless wanderers, skulks, loafers.

fired at when quietly paddling our canoes by night! I, even I, Kawiti, must not paddle this way, nor paddle that way, because the Governor said ‘No’—because of the Governor, his soldiers, and his guns! No, no, no. Go back, go back; there is no place here for the Governor.”

Wai, a chief of the Ngaitawake Tribe, rose and said, “To thee, O Governor! this. Will you remedy the selling, the exchanging, the cheating, the lying, the stealing of the whites? O Governor! yesterday I was cursed by a white man. Is that straight? The white gives us Natives a pound for a pig; but he gives a white four pounds for such a pig. Is that straight? The white gives us a shilling for a basket of potatoes; but to a white he gives four shillings for a basket like [23] that one of ours. Is that straight? No, no; they will not listen to thee: so go back, go back. If they would listen and obey, ah! yes, good that; but have they ever listened to Busby? And will they listen to thee, a stranger, a man of yesterday? Sit, indeed! what for? Wilt thou make dealing straight?”

Here there was an interruption by a white man named Jones (a hawker and pedlar of Kororareka), and by the white man who had previously addressed the Governor, and also by another young white man, who all three spoke to the Governor at one time from different parts of the tent, calling on His Excellency to have the speeches interpreted for the whites to hear, and also to have them interpreted correctly. Johnson was again called for to come forward, who, on the Governor desiring him to do so, interpreted the speech of the last speaker, Wai, commenting on the same, after first remarking that “it was great lies.”

Pumuka, chief of the Roroa Tribe, rose and said, "Stay, remain, Governor; remain for me. Hear, all of you. I will have this man a foster-father for me. Stay, sit, Governor. Listen to my words, O Governor! Do not go away; remain. Sit, Governor, sit. I wish to have two fathers—thou and Busby, and the missionaries."

Warerahi (George King), a chief of the Ngaitawake Tribe, rose and said, "Yes! What else? Stay, sit; if not, what? Sit; if not, how? Is it not good to be in peace? We will have this man as our Governor. What! turn him away! Say to this man of the Queen, Go back! No, no."⁶⁵⁷

Here a commotion and bustle took place among the Natives, who were sitting closely packed, in consequence of a lane or open space being made in front of the [24] platform for Tareha, and for Hakiro, and for other chiefs to make their running speeches in, à la *Nouvelle-Zélande*.

Hakiro (son of Tareha, but who on this occasion appeared and spoke on behalf of Titore,⁶⁵⁸ deceased,

657 WC: After him a chief of Waikare spoke of the unjust dealings of the whites, saying that for a very little thing—a shilling—they wanted a pig as big as himself, and much more to the same purpose. Would the Governor cause them to give as large a payment as the article they got?—J.B. (Meaning its fair value.) Not much noticed in the bustle.

658 WC: I may here briefly state, in a note, that Titore was one of the most powerful and best of the many Ngapuhi chiefs of high rank—so much of Nature's true nobility of manner and appearance about him; his voice, too, was mild, yet firm, possessing more of the *suaviter* than the *fortiter*, so contrary to the usual loud bluster of the Maori, especially of those chiefs residing on the shores of the harbour, whose manners were not improved through their

principal chief of the Ngatinanenane Tribe) arose and said, "To thee, O Governor! this. Who says 'Sit'? Who? Hear me, O Governor! I say, no, no. Sit, indeed! Who says 'Sit'? Go back, go back; do not thou sit here. What wilt thou sit here for? We are not thy people. We are free. We will not have a Governor. Return, return; leave us. The missionaries and Busby are our fathers. We do not want thee; so go back, return, walk away."

Tareha, chief of the Ngatirehia Tribe, rose, and, with much of their usual national gesticulation, said, "No Governor for me—for us Native men. We, we only are the chiefs, rulers. We will not be ruled over. What thou, a foreigner, up, and I down! Thou high, and I, Tareha, the great chief of the Ngapuhi tribes, low! No, no; never, never. I am jealous of thee; I am, and shall be, until thou and thy ship go away. Go back, go back; thou shalt not stay here. No, no; I will never say 'Yes.' Stay! Alas! what for? why? What is there here for thee? Our lands are already all gone. Yes, it is so, but our names remhn. Never mind; what of that—the lands of our fathers alienated? Dost thou think we are poor, indigent, poverty-stricken—that we really need thy foreign garments, thy food? Lo! note this." (Here he held up high a bundle of fern-roots he [25] carried in his hand,

common intercourse with shipping and low-class whites. I had visited him on his death-bed (he died comparatively early, from consumption), and, though he was not a Christian, I was much pleased with his demeanour. Our parting was a mournful yet very affectionate one. There is a very fair likeness of him (there called "Tetoro") given as a frontispiece in Captain Cruise's "*Ten Months' Residence in New Zealand*," taken before the invention of photography.

displaying it.) “See, this is my food, the food of my ancestors, the food of the Native people. Pshaw, Governor! To think of tempting men—us Natives—with baits of clothing and of food! Yes, I say we are the chiefs. If all were to be alike, all equal in rank with thee—but thou, the Governor up high—up, up, as this tall paddle” (here he held up a common canoe-paddle), “and I down, under, beneath! No, no, no. I will never say, Yes, stay.’ Go back, return; make haste away. Let me see you [all] go, thee and thy ship. Go, go; return, return.”⁶⁵⁹

Tareha was clothed with a filthy piece of coarse old floor-matting, loosely tied round him, such as is used by the commonest Natives merely as a floor-mat under their bedding. He was evidently dressed up in this fashion in order the more effectually to ridicule the supposition of the New-Zealanders being in want of any extraneous aid of clothing, &c., from foreign nations. He also carried in his hand, by a string, a bunch of dried fern-root, formerly their common vegetable food, as bread with us. His habit, his immense size—tall and very robust (being by far the biggest Native of the whole district)—and his deep sepulchral voice, conspired to give him peculiar prominence, and his words striking effect: this last was unmistakably visible on the whole audience of Natives.

Rawiri, a chief of the Ngatitautahi Tribe, arose arid said (first sentence in English), “Good morning, Mr. Governor! very good you! Our Governor, our Father! Stay here, O Governor! Sit, that we may be in peace. A

659 WC: Here I should state that those chiefs, Rewa, Moka, Tareha, and Hakiro, were all from Kororareka, their residence being close to the Roman Catholic bishop's.

good thing this for us—yes, for us, my friends, Native men. Stay, sit. Do thou remain, O Governor! to be a Governor for us.”

Hoani Heke, a chief of the Matarahurahu Tribe, arose and said, “To raise up, or to bring down? to raise up, or to bring down? Which ? which ? Who knows ? Sit [26] Governor, sit. If thou shouldst return, we Natives are gone, utterly gone, nothinged, extinct. What, then, shall we do? Who are we? Remain, Governor, a father for us. If thou goest away, what then? We do not know. This, my friends,” addressing the Natives around him, “is a good thing. It is even as the word of God” (the New Testament, lately printed in Maori at Paihia, and circulated among the Natives). “Thou to go away! No, no, no! For then the French people or the rum-sellers will have us Natives. Remain, remain; sit, sit here; you with the missionaries, all as one. But we Natives are children—yes, mere children. Yes; it is not for us, but for you, our fathers—you missionaries—it is for you to say, to decide, what it shall be. It is for you to choose. For we are only Natives. Who and what are we? Children—yes, children solely. We do not know: do you then choose for us. You, our fathers—you missionaries. Sit, I say, Governor, sit! a father, a Governor for us.” (Pronounced with remarkably strong and solemn emphasis, well supported both by gesture and manner.)

Hakitara, a chief of the Rarawa Tribe, rose and said a few words; but, in consequence of several talking (both whites and Natives) the one to the other at this moment, remarking on Hoani Heke’s speech and manner, and from Hakitara speaking low, what he said was not plainly

heard. He spoke, however, in favour of the Governor's remaining.

Tamati Waka Nene, chief of the Ngatihao Tribe, rose and said, "I shall speak first to us, to ourselves, Natives" (addressing them). "What do you say? The Governor to return? What, then, shall we do? Say here to me, O ye chiefs of the tribes of the northern part of New Zealand! what we, how we?" (Meaning, how, in such a case, are we henceforward to act?) "Is not the land already gone? is it not covered, all covered, with men, with strangers, foreigners—even as the grass and herbage—over whom we have no power? We, the chiefs and Natives of this land, are down low; they are up high, exalted. What, what do you say? [27] The Governor to go back? I am sick, I am dead, killed by you. Had you spoken thus in the old time, when the traders and grog-sellers came—had you turned them away, then you could well say to the Governor, 'Go back,' and it would have been correct, straight; and I would also have said with you, 'Go back;—yes, we together as one man, one voice. But now, as things are, no, no, no." Turning to His Excellency, he resumed, "O Governor! sit. I, Tamati Waka, say to thee, sit. Do not thou go away from us; remain for us—a father, a judge, a peacemaker. Yes, it is good, it is straight. Sit thou here dwell in our midst. Remain; do not go away. Do not thou listen to what [the chiefs of] Ngapuhi say. Stay thou, our friend, our father, our Governor."

Eruera Maehe Patuone (the elder brother of Tamati Waka Nene, who has for some time been living in the island of Waiheke, in the Thames, and who only came up from

thence a few weeks back) rose and said, “What shall I say on this great occasion, in the presence of all those great chiefs of both countries? Here, then, this is my word to thee, O Governor! Sit, stay—thou, and the missionaries, and the Word of God. Remain here with us, to be a father for us, that the French have us not, that Pikopo, that bad man, have us not. Remain, Governor. Sit, stay, our friend.”

Te Kemara (who had spoken the first) here jumped up, and, in his usual excitable, lively, and flourishing manner, said, “No, no. Who says ‘Stay’? Go away; return to thine own land. I want my lands returned to me. If thou wilt say, ‘Return to that man Te Kemara his land,’ then it would be good. Let us all be alike [in rank, in power]. Then, O Governor! remain. But, the Governor up! Te Kemara down, low, fiat! No, no, no. Besides, where art thou to stay, to dwell? There is no place left for thee.⁶⁶⁰ Here Te Kemara ran up to the [28] Governor, and, crossing his wrists, imitating a man hand-cuffed, loudly vociferated, with fiery flashing eyes, “Shall I be thus, thus? Say to me, Governor, speak. Like this, eh? like this? Come, come, speak, Governor. Like this, eh?” He then seized hold of the Governor’s hand with both his and shook it most heartily, roaring out with additional grimace and gesture (in broken English), “How d’ye do, eh, Governor? How d’ye do, eh, Mister Governor?” This he did over, and over, and over again, the Governor

660 WC: When Te Kemara said to the Governor, “There is no place left for thee,” I said that “my house would be occupied by the Governor;” which intimation served to produce the change in his demeanour.—J.B.

evidently taking it in good part, the whole assembly of whites and browns, chief and slave, Governor, missionaries, officers of the man-o'-war, and, indeed, "all hands," being convulsed with laughter.

This incident ended this day's meeting.

His Excellency then gave public notice that on Friday, the 7th instant, at 10 a.m., the meeting would be reassembled.

Three cheers were then given for the Governor, in which all lustily joined. Soon after the several parties separated, apparently, I thought, pleased.

A truly laughable event (serio-comic, I might call it) happened as the Governor and his suite, with the captain and officers of the man-o'-war, were embarking. The anecdote is too good to be wholly lost. I was one of those who escorted the Governor to his boat, some distance off on the sandy beach below. His Excellency was talking with me, by the way, about the printing of the treaty and other kindred matters. To get to the boat we had to go down a short, easy, though rude pathway in the side of the hill (Waitangi House being situate on high ground). We had arrived near the boat, which the sailors were launching—it being low water—when a Native chief, an elderly man from the interior, who had only just arrived (a few others had also kept dropping in during the morning)—almost another Te Kemara—rushed down the decline, burst before us, laid his hands on the gunwale of the captain's launch to stop her (the sailors, half-amazed, looking at their chief), and, turning himself round, [29] looked staringly and scrutinizingly into the Governor's face, and, having surveyed it, exclaimed in a

shrill, loud, and mournful voice, “Auee! he koroheke! Ekore e roa kua mate.” (I felt “wild” at him.) The Governor, turning to me said, “What does he say?” I endeavonred to parry the direct question by answering, “Oh, nothing of importance. A stranger chief only just arrived from the interior, running hither to catch you, and bidding you his greeting.” But, as His Excellency’s desire to know was keenly aroused, with that of Captain Nias and his officers by his side, and perhaps that of many of the whites present, including the sailors, who had ceased dragging down the boat, the Governor rejoined imploringly to me, “Now pray do, Mr. Colenso, tell me the exact meaning of his words. I much wish to know it all.” So, being thus necessitated (for there were others present who knew enough of Maori), I said, “He says, ‘Alas! an old man. He will soon be dead!’” His Excellency thanked me for it, but a cloud seemed to have fallen on all the strangers present, and the party embarked in silence for their ship.

In the afternoon a quantity of tobacco (negro-head) was distributed among the Natives, or, rather, was intended to be so, for they soon upset the superintending officer (who was obliged, *nolens volens*, to put up with the loss of his dignity), and so got the tobacco among them, by which, however, some got a large share, and some got little, and others none at all. This occurrence occasioned much dissatisfaction among the Natives, and for some time I feared the result.

Notwithstanding the public notice given by the Governor that the next meeting would be held on the Friday, 7th, it was found on consideration this evening that it would be

advisable to hold the same on to-morrow, Thursday, 6th, inasmuch as the number of Natives gathered together was large, and they had no supply of food with them; neither was there any place at hand (or within several miles, and only situate on the opposite shores of the bay) where they might obtain any. Several of the Native chiefs [30] said they could not possibly remain so long at Waitangi; that they should be “dead from hunger,” &c. It was therefore proposed that the second meeting should be held on the next day, Thursday, instead of the Friday, as first agreed on, and that the Governor should be made acquainted with this necessary alteration in the day.

SECOND DAY'S MEETING.

Thursday, February 6th, 1840.—This morning, at 9.30, we (the missionaries) left Paihia Station for Waitangi, a mile and a half distant. On our arrival we found that the Natives were already there—not, however, such a large party as was present the day before. The fierce squabble about the tobacco yesterday, coupled with the remembrance of the sad murderous affray which took place here on the Whananake question,⁶⁶¹ had sent several to their respective homes. Nevertheless, there were several present—not less than 300, or even 400—scattered in small parties according to their tribes, talking about the treaty, but evidently not clearly understanding it. Time passed by, 11 o'clock came, but no Governor,

661 WC: In 1836, when two Natives were killed and several wounded of the Christian and unarmed party by their heathen relatives, on judgment being given against them.

nor could any movement be discerned on board H.M.S. "Herald" from which it might be inferred that His Excellency was coming; the Natives, too, were becoming impatient. About noon a boat from the ship came ashore, with two of the officers of His Excellency's suite, who seemed surprised at our saying we were there waiting for the Governor, as they said "His Excellency certainly knew nothing about a meeting to be held there this day." It was now evident that a misunderstanding had somehow arisen. A. boat was instantly despatched to the ship to let the Governor know; and he soon arrived, in plain clothes, except his hat, and unattended by any of the officers of the "Herald." He assured us he had not the least notion of a meeting to be held this day; but that, as it was, he would take the signatures of the Native chiefs who were present and [31] desirous of signing the treaty: still, he must have a public meeting on the morrow (Friday), pursuant to the notice he had already given at the close of the meeting yesterday, &c.

We then proceeded to the tent, where, after some little delay and difficulty, the Natives assembled together. Some few necessary arrangements having been entered into for the better and more regular signing of their names, the Governor rose and said, "I can only receive signatures this day. I cannot allow of any discussion, this not being a regular public meeting." At this stage of the proceedings a messenger came to the Governor, informing him that the French Roman Catholic bishop and a priest were at Mr. Busby's house, and that they wished to be present at the meeting, &c.; on which the Governor despatched his secretary to bring them over to the tent. They soon came, and took their seats in the same

places they had occupied on the preceding day. His Excellency then proposed that the Rev. H. Williams should read the treaty to the Natives from the parchment (as that read the day before was from the draft on paper), which was done by Mr. Williams.

Here the Roman Catholic bishop made some remarks to the Governor in an undertone, which were not heard by us; and the Governor, addressing himself to the Rev. H. Williams, who was acting as interpreter, said, "The bishop wishes it to be publicly stated to the Natives that his religion will not be interfered with, and that free toleration will be allowed in matters of faith. I should therefore thank you to say to them that the bishop will be protected and supported in his religion—that I shall protect all creeds alike."

On which Mr. Williams, addressing the Natives, said, "Na, e mea ana te Kawana." ("Attend, the Governor says"—) when he stopped, and, turning to Mr. G. Clarke, of the Church Mission, standing next to him, said something that was inaudible beyond the spot on which they two stood. Mr. Clarke, however, appeared not to understand—at least, [32] not to hear plainly what Mr. Williams had said. Seeing this, I, who stood next, said to Mr. Williams, "Pray, sir, write it down first, as it is an important sentence." Then Mr. Williams, taking paper and pencil, proceeded to do so. The paper, when written on, was passed to the Governor for the Roman Catholic bishop's inspection, who, having read it, said in English, "This will do very well;" on which the paper was returned to Mr. Williams, who read the same to the Natives.

The slip of paper contained the following words: “E mea ana te Kawana, ko nga whakapono katoa, o Ingarani, o nga Weteriana, o Roma, me te ritenga Maori hoki, e tiakina ngatahitia e ia.” (“The Governor says the several faiths [beliefs] of England, of the Wesleyans, of Rome, and also the Maori custom, shall be alike protected by him.”) I got Mr. Williams (though with some little hesitation on his part) to insert “me te ritenga Maori hoki” (“and also the Maori custom, or usage”) as a correlative to that “of Rome.”

All being now ready for the signing, the Native chiefs were called on in a body to come forward and sign the document. Not one, however, made any move nor seemed desirous of doing so till Mr. Busby, hitting on an expedient, proposed calling them singly by their names as they stood in *his* (private) list, in which list the name of Hoani Heke (known, too, to be the most favourable towards the treaty) happened to be the first—at least, of those who were this day present. On his being called by name to come and sign, he advanced to the table on which the treaty lay. At this moment I, addressing myself to the Governor, said,—

“Will your Excellency allow me to make a remark or two before that chief signs the treaty?” The Governor: “Certainly, sir.” Mr. Colenso: “May I ask your Excellency whether it is your opinion that these Natives understand the articles of the treaty which they are now called upon to sign? I this morning”— [33]

The Governor: “If the Native chiefs do not know the contents of this treaty it is no fault of mine. I wish them fully to understand it. I have done all that I could do to

make them understand the same, and I really don't know how I shall be enabled to get them to do so. They have heard the treaty read by Mr. Williams."

Mr. Colenso: "True, your Excellency; but the Natives are quite children in their ideas. It is no easy matter, I well know, to get them to understand—fully to comprehend a document of this kind; still, I think they ought to know somewhat of it to constitute its legality. I speak under correction, your Excellency. I have spoken to some chiefs concerning it, who had no idea whatever as to the purport of the treaty."

Mr. Busby here said, "The best answer that could be given to that observation would be found in the speech made yesterday by the very chief about to sign, Hoani Heke, who said, 'The Native mind could not comprehend these things : they must trust to the advice of their missionaries.'

Mr. Colenso: "Yes; and that is the very thing to which I was going to allude. The missionaries should do so; but at the same time the missionaries should explain the thing in all its bearings to the Natives, so that it should be their own very act and deed. Then, in case of a reaction taking place, the Natives could not turn round on the missionary and say, 'You advised me to sign that paper, but never told me what were the contents thereof.'"

The Governor: "I am in hopes that no such reaction will take place. I think that the people under your care will be peaceable enough: I'm sure you will endeavour to make them so. And as to those that are without, why we must endeavour to do the best we can with them."

Mr. Colenso: "I thank your Excellency for the patient hearing you have given me. What I had to say arose from a conscientious feeling on the subject. Having said what I have I consider that I have discharged my duty." [34]

Here Hoani Heke signed the treaty, on which several others came forward and did the same.

Whilst the treaty was being signed, Marupo, chief of the Wanaurara Tribe, and Ruhe, a chief of the Ngatihineira Tribe, made long speeches against the signing of the same. Both declaimed strongly in true New Zealand style, running up and down, flourishing their hands and arms, stamping with their feet, &c. Marupo was stripped naked to the loins, and continued his oratory and gestures until he was exhausted. Both, however, of these chiefs subsequently came to the table and signed the treaty. Marupo, having made his mark (as he could neither read nor write), shook hands heartily with the Governor, and seized hold of, and much wished to put on, His Excellency's hat, which was lying on the table. After some little time Te Kemara came towards the table and affixed his sign to the parchment, stating that the Roman Catholic bishop (who had left the meeting before any of the chiefs had signed) had told him "not to write on the paper, for if he did he would be made a slave."

Rewa was now the only chief of note present who still refused to sign, but after some time, being persuaded by some of his Native friends as well as by the members of the Church of England Mission, he came forward and signed the treaty, stating to the Governor that the Roman Catholic bishop had told him not to do so, and that be

(the Roman Catholic bishop) had striven hard with him not to sign.

During the signing of the treaty a few chiefs arrived who were not present on the first day from not receiving their summoning letters in time and from the long distance they had to come—of course on foot. They, however, signed the document. Forty-five chiefs signed the treaty at this second day of meeting. The greater part of them were from the Bay of Islands and its immediate vicinity. Among them, however, were not many chiefs of the first rank. In fact, there were none present from any distance save [35] Tamati Waka Nene and his brother Patuone, from the Hokianga district; and Kauwata, Warau, and Ngere, from the Wangaruru district.

His Excellency appeared to be in good health and spirits, and to be much interested in the scenes before him. As each chief affixed his name or sign to the treaty the Governor shook him by the hand, saying (in Maori), “He iwi tahi tatou” (“We are [now] one people”), at which the Natives were greatly pleased.

All that were disposed having signed, the Natives gave three cheers for the Governor.

His Excellency, on leaving, requested me to attend to the distributing of a bale of blankets and a cask of tobacco to the Natives, which occupied me till late, each chief who had signed the document getting two blankets and a quantity of tobacco. By dint of close and constant management the said distribution went off well without any mishap or hitch.

Friday, February 7th, 1840.—This morning was ushered in with very heavy rain, which continued with hardly any intermission till towards evening. Consequently it could not but be considered as a very fortunate occurrence—as far, at least, as the holding of the second meeting went—that it was held yesterday, on the Thursday; for had it not been held on that day it could not possibly have been held on this day (Friday), as originally fixed, and many of the Natives, who could not have remained together until Saturday (to-morrow), would have returned to their several villages—and, perhaps, displeased and disheartened.

Saturday, February 8th.—This morning H.M.S. “Herald” hoisted a profusion of British colours and fired a Royal salute of twenty-one guns in honour of the new British Colony of New Zealand. At Kororareka, too, there was a great display, &c. The members of the mission went over to Kororareka, but I could not possibly go, being very busy in the printing-office with Proclamations, two treaties, &c. [36]

Monday, February 10th.—This morning the Governor and suite and the captain of H.M.S. “Herald” rode to Te Waimate Mission-station, in the interior, where they obtained some signatures to the treaty. On Tuesday, the 11th, they proceeded on to Hokianga where they obtained a great number of signatures. On Friday, the 14th, they returned to the Bay of Islands and to their ship.

The total number of signatures obtained at Waitangi, Te Waimate, and Hokianga was about one hundred and twenty. [37]

APPENDIX.

PROCLAMATION.

BY His Excellency WILLIAM Hobson, Esquire,
Lieutenant-Governor of the British Settlements in
progress in New Zealand, &c., &c., &c.

WHEREAS Her Majesty VICTORIA, Queen of the United Kingdom of Great Britain and Ireland, has been graciously pleased to direct that measures shall be taken for the establishment of a settled form of civil government over those of Her Majesty's subjects who are already settled in New Zealand, or who may hereafter resort hither: And whereas Her Majesty has also been graciously pleased to direct Letters Patent to be issued under the Great Seal of the said United Kingdom, bearing date the fifteenth day of June, in the year one thousand eight hundred and thirty-nine, by which the former boundaries of the Colony of New South Wales are so extended as to comprehend any part of New Zealand that is or may be acquired in sovereignty by Her Majesty, her heirs or successors: And whereas Her Majesty has been further pleased, by a Commission under her Royal Signet and Sign-Manual, bearing date the thirtieth day of July, one thousand eight hundred and thirty-nine, to appoint me, William Hobson, Esquire, Captain in Her Majesty's Navy, to be Lieutenant-Governor in and over any territory which is or may be acquired in sovereignty by Her Majesty, her heirs or successors, within that group of islands in the Pacific Ocean commonly called New

Zealand, and lying between the latitude thirty-four degrees thirty minutes and forty-seven degrees ten minutes south, and one hundred and sixty-six degrees five minutes and one hundred and seventy-nine degrees east longitude from the meridian of Greenwich: Now, therefore, I, the said William Hobson, do hereby declare and proclaim that I did, on the fourteenth day of January instant, before His Excellency Sir George Gipps, Knight, Captain-General and Governor-in-Chief in and over the Territory of New South Wales and its Dependencies, and the Executive Council thereof, take the accustomed oaths of office as Lieutenant-Governor as aforesaid. [38] And I do hereby further proclaim and declare that I have this day opened and published the two Commissions aforesaid, that is to say, the Commission under the Great Seal extending the boundaries of the Government of New South Wales, and the Commission under the Royal Sign-Manual, appointing me Lieutenant-Governor as aforesaid. And I do hereby further proclaim and declare that I have this day entered on the duties of my said office as Lieutenant-Governor as aforesaid, and I do call upon all Her Majesty's subjects to be aiding and assisting me in the execution thereof.

Given under my hand and seal, at Kororika, this thirtieth day of January, one thousand eight hundred and forty, and in the third year of Her Majesty's reign.

(Signed) WILLIAM HOBSON,
Lieutenant-Governor.

By His Excellency's Command.

(Signed) GEORGE COOPER.

GOD SAVE THE QUEEN!

THE TREATY OF WAITANGI.

ENGLISH VERSION.

HER MAJESTY VICTORIA, Queen of the United Kingdom of Great Britain and Ireland, regarding with Her Royal Favour the Native Chiefs and Tribes of New Zealand, and anxious to protect their just Rights and Property, and to secure to them the enjoyment of Peace and Good Order, has deemed it necessary, in consequence of the great number of Her Majesty's Subjects who have already settled in New Zealand and the rapid extension of Emigration both from Europe and Australia which is still in progress, to constitute and appoint a functionary properly authorised to treat with the Aborigines of New Zealand for the recognition of Her Majesty's Sovereign authority over the whole or any part of those islands. Her Majesty, therefore, being desirous to establish a settled form of Civil Government with a view to avert the evil consequences which must result from the absence of the necessary Laws and Institutions alike to the Native population and to Her subjects, has been graciously pleased to empower and authorise me, WILLIAM HOBSON, a Captain in Her Majesty's Royal Navy, Consul, and

Lieutenant-Governor of such parts of New Zealand as may be, or hereafter shall be, ceded to [39] Her Majesty, to invite the confederated and independent Chiefs of New Zealand to concur in the following Articles and Conditions.

Article the First.

The Chiefs of the Confederation of the United Tribes of New Zealand, and the separate and independent Chiefs who have not become members of the Confederation, cede to Her Majesty the Queen of England, absolutely and without reservation, all the rights and powers of Sovereignty which the said Confederation or Individual Chiefs respectively exercise or possess or may be supposed to exercise or to possess over their respective Territories as the sole sovereigns thereof.

Article the Second.

Her Majesty the Queen of England confirms and guarantees to the Chiefs and Tribes of New Zealand, and to the respective families and individuals thereof, the full, exclusive, and undisturbed possession of their Lands and Estates, Forests, Fisheries, and other properties which they may collectively or individually possess so long as it is their wish and desire to retain the same in their possession; but the Chiefs of the United Tribes and the Individual Chiefs yield to Her Majesty the exclusive right of Pre-emption over such lands as the Proprietors thereof may be disposed to alienate, at such prices as may be agreed upon between the respective Proprietors and persons appointed by Her Majesty to treat with them in that behalf.

Article the Third.

In consideration thereof, Her Majesty the Queen of England extends to the Natives of New Zealand Her Royal protection and imparts to them all the Rights and Privileges of British subjects.

W.HOBSON,
Lieutenant-Governor

Now, therefore, We, the Chiefs of the Confederation of the United Tribes of New Zealand, being assembled in Congress at Victoria, in Waitangi, and We, the Separate and Independent Chiefs of New Zealand, claiming authority over the Tribes and Territories which are specified after our respective names, having been made fully to understand the Provisions of the foregoing Treaty, accept and enter into the same in the full spirit and meaning thereof: in witness of which, we have attached our signatures or marks at the places and the dates respectively specified.

Done at Waitangi, this sixth day of February, in the year of Our Lord one thousand eight hundred and forty. [40]

MAORI VERSION.

KO WIKITORIA, te Kuini o Ingarani, i tana mahara atawai ki nga Rangatira me Nga Hapu o Nu Tirani, i tana hiahia hoki kia tohungia ki a ratou o ratou rangatiratanga me to ratou wenua, a kia mau tonu hoki te Rongo ki a ratou me te ata noho hoki, kua wakaaro ia he mea tika kia tukua

mai tetahi Rangatira hei kai wakarite ki nga tangata maori o Nu Tirani. Kia wakaetia e nga Rangatira maori te Kawanatanga o te Kuini, ki nga wahi katoa o te wenua nei me nga motu. Na te mea hoki he tokomaha ke nga tangata o tona iwi kua noho ki tenei wenua, a e haere mai nei.

Na, ko te Kuini e hiahia ana kia wakaritea te Kawanatanga, kia kaua ai nga kino e puta mai ki te tangata maori ki te pakeha e noho ture kore ana.

Na kua pai te Kuini kia tukua a hau, a WIREMU HOPIHONA, he Kapitana i te Roiara Nawa, hei Kawana mo nga wahi katoa o Nu Tirani, e tukua aianei amua atu ki te Kuini; e mea atu ana ia ki nga Rangatira o te Wakaminenga o nga Hapu o Nu Tirani, me era Rangatira atu, enei ture ka korerotia nei.

Ko te Tuatahi.

Ko nga Rangatira o te Wakaminenga me nga Rangatira katoa hoki, kihai i uru ki taua Wakaminenga, ka tuku rawa atu ki te Kuini o Ingari o ake tonu atu te Kawanatanga katoa o o ratou wenua.

Ko te Tuarua.

Ko te Kuini o Ingari o ake tonu atu te Kawanatanga katoa o o ratou wenua, kihai i uru ki taua Wakaminenga, me nga Rangatira katoa atu, ka tuku ki te Kuini te hokonga o era wahi wenua e pai ai te tangata nona te wenua, kite ritenga o te utu e wakaritea ai e ratou ko te kai hoko e meatia nei e te Kuini hei kai hoko mona.

Ko te Tuatoru.

Hei wakaritenga mai hoki tenei me te wakaetanga ki te Kawanatanga o te Kuini. Ka tiakina e te Knini o Ingaran i nga tangata maori katoa o Nu Tirani. Ka tukua ki a ratou nga tikanga katoa rite tahi ki ana mea ki nga tangata o Ingaran i.

(Signed) WILLIAM HOBSON,
Consul and Lieutenant Governor.

Na, ko matou, ko nga Rangatira o te Wakaminenga o nga Hapu o Nu Tirani, ka huihui nei ki Waitangi. Ko matou hoki ko nga Rangatira o Nu Tirani, ka kite nei i te ritenga o [41] enei knpu, ka tangohia, ka wakaetia katoatia e matou. Koia ka tohungia ai o matou ingoa o matou tohu.

Ka meatia tenei ki Waitangi, i te ono o nga ra o Pepuere, i te tau kotahi mano, e waru rau, e wa tekau, o to tatou Ariki.

PROCLAMATION.

IN the Name of Her Majesty VICTORIA, Queen of the United Kingdom of Great Britain and Ireland. By WILLIAM HOBSON, Esquire, a Captain in the Royal Navy, Lieutenant-Governor in New-Zealand.

WHEREAS, by a Treaty bearing Date the Fifth day of February, in the Year of Our Lord One Thousand Eight Hundred and Forty, made and executed by me, WILLIAM HOBSON, a Captain in the Royal Navy, Consul, and

Lieutenant-Governor in New-Zealand, vested for this purpose with full Powers by Her Britannic Majesty, of the one part, and the Chiefs of the Confederation of the United Tribes of New-Zealand, and the Separate and Independent Chiefs of New-Zealand, not Members of the Confederation, of the other; and further ratified and confirmed by the adherence of the Principal Chiefs of this Island of New-Zealand, commonly called "The Northern Island"; all Rights and Powers of Sovereignty over the said Northern Island were ceded to Her Majesty the Queen of Great Britain and Ireland, absolutely and without reservation: Now, therefore, I, WILLIAM HOBSON, Lieutenant-Governor of New-Zealand, in the Name and on the Behalf of Her Majesty, do hereby Proclaim and Declare; to all Men, that from and after the Date of the above-mentioned Treaty, the full Sovereignty of the Northern Island of New-Zealand vests in Her Majesty Queen Victoria, Her Heirs and Successors for ever.

Given under my hand at Government-House, RUSSELL, Bay of Islands, this Twenty-first Day of May, in the Year of our Lord One Thousand Eight Hundred and Forty.

(Signed,) WILLIAM HOBSON,
Lieutenant-Governor.

By His Excellency's command,
(Signed,) WILLOUGHBY SHORTLAND,
Colonial Secretary.

PAIHIA: Printed at the Press of the Church Missionary Society. [42]

PROCLAMATION.

IN the Name of Her Majesty VICTORIA, Queen of the United Kingdom of Great Britain and Ireland, By WILLIAM HOBSON, Esquire, a Captain in the Royal Navy, Lieutenant-Governor of New-Zealand.

WHEREAS I have it in Command from Her Majesty Queen VICTORIA, through Her principal Secretary of State for the Colonies, to assert, on the grounds of Discovery, the Sovereign Rights of Her Majesty over the Southern Islands of New-Zealand, commonly called "The Middle Island" and "Stewart's Island"; and the Island commonly called "The Northern Island" having been ceded in sovereignty to Her Majesty:

Now, therefore, I, WILLIAM HOBSON, Lieutenant-Governor of New-Zealand, do hereby Proclaim and Declare to all men that, from and after the Date of these Presents, the full Sovereignty of the Islands of New-Zealand, extending from Thirty-four Degrees Thirty Minutes to Forty-seven Degrees Ten Minutes South Latitude, and between One Hundred and Sixty-six Degrees Five Minutes to One Hundred and Seventy-nine Degrees of East Longitude, vests in Her Majesty Queen VICTORIA, Her Heirs and Successors for ever.

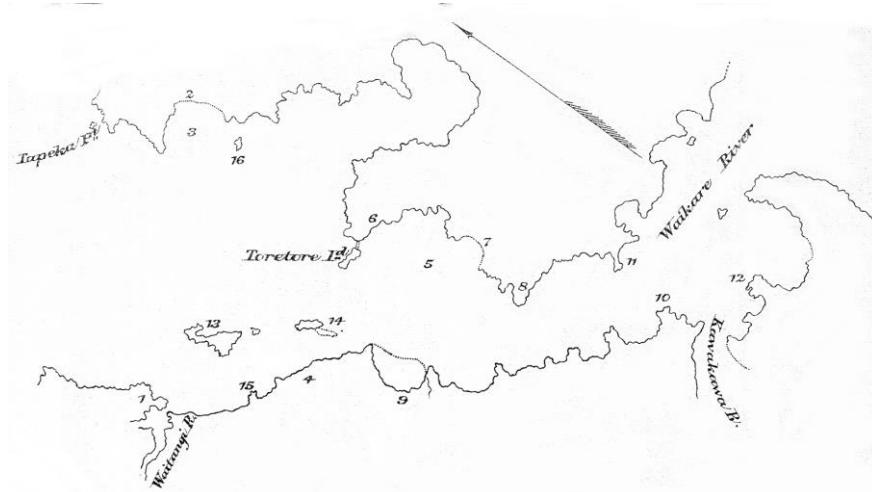
Given under my hand at Government-House, RUSSELL, Bay of Islands, this Twenty-first Day of May, in the Year of Our Lord One Thousand Eight Hundred and Forty.

(Signed,) WILLIAM HOBSON,
Lieutenant-Governor.

By His Excellency's command,
(Signed,) WILLOUGHBY SHORTLAND,
Colonial Secretary.

GOD SAVE THE QUEEN.

PAIHIA: Printed at the Press of the Church Missionary
Society



Part of the inner or S.W. harbour of the Bay of Islands, showing Waitangi (where the treaty was signed), Okiato (Russell), the first seat of Government, and other principal places mentioned in this book. 1. Waitangi. 2. Kororareka (now Russell). 3. Kororeareka anchorage. 4. Paihia. 5. The inner anchorage. 6. Wahapu, merchant's store and American consulate. 7. Omata. 8. Okiato (first seat of Government and first Russell). 9. Te Haumi ("Muddy-muddy" of seamen!). 10. Opua. 11. Oropoa. 12. Otuihu (Pomare's stronghold). 13. Motomaire Islet. 14. Motuorangi Islet. 15. Nihonui Point. 16. Observatory Islet (used by the French surveying ships, A.D. 1824, 1832, for that purpose).

**1890 A Description of some Newly-discovered
Indigenous Plants, being a Further
Contribution towards the making known the
Botany of New Zealand.
Transactions of the New Zealand Institute 23: 381-
391.**

[Read before the Hawke's Bay Philosophical Institute,
14th July and 14th November, 1890.]

CLASS I. DICOTYLEDONS.

Order I. RANUNCULACEÆ.

Genus 3.⁶⁶² *Ranunculus*, Linn.

1. *R. muricatus*,⁶⁶³ sp. nov.

Plant small; rootstock perennial, short, very thick, with many long descending rootlets. Leaves 10–20, sub-rosulate, radiately-spreading, equal in length, closely appressed to the ground, broadly ovate or sub-orbicular in outline, 1½–3 lines diameter, tips obtuse, bases truncate, usually 3-lobed; lobes nearly equal, their tips obtuse rounded, sometimes sub-acute and notched, green, with purplish margins, 3- (sub 5-) nerved, nerves simple, slightly hairy on upper surface more so beneath; hairs long, white, straight, extending beyond margins; petioles ½ in. long, slender, sulcated, purple, very hairy, their bases glabrous, membranous, much dilated and clasping. Scapes, usually 1–3 to a plant, slender, erect, 1½ in.–3 in.

662 WC: The numbers attached to the orders and genera in this paper are those of them in the "Handbook, Flora of New Zealand."

663 *Ranunculus multiscapus* Hook.f.

high, purple, with darker spots, very hairy; hairs white, closely appressed above, with muricated bases, patent below. Flower $\frac{1}{2}$ in. diameter, spreading. Sepals 5, purple, scarcely half the length of petals, spreading, ovate, tips obtuse, strongly 1-nerved, the 2 (or 3) outer ones with broad filmy white edges, very hairy, hairs white, with large muricated bases, extending beyond tips and margins. Petals 5 (very rarely 6), linear-oblong, obtuse, golden-yellow, shining, purplish on outside, with darker purple streaks on nerves, 5–7-nerved, nerves branching above; gland near base large, extending across petal, truncate, free, [382] margin crenulate. Anthers numerous, broadly elliptic. Stigmas hooked, finely papillate. Achenes in a small round head, about 12, glabrous, sub-orbicular, turgid.

Hab. High, dry, open plains, Tahoraiti, south of Dannevirke, County of Waipawa; flowering early in October; gregariously scattered, presenting when together, and the sun shining, a neat pleasing appearance, from their star-like brilliant yellow flowers; 1885–1890: W.C.

Obs. This little plant, I confess, has much puzzled me, and that for a long time—ever since my first detecting it, six years ago—as it certainly approaches *R. multiscapus*, Hook., very closely. It differs, however, from that species in several particulars: as in its common manner of growth, stellate and closely appressed to the ground, smaller and more simple leaves, fewer scapes, purple sepals, remarkably long white hairs, with their very conspicuous muricated bases, on the calyx lobes,—a prominent and invariable character that could not have

been overlooked by Hooker. In this spring season (1890) I visited those localities much earlier than I had ever done before, and so saw this neat but humble plant (with several other lowly harbingers) in all its glory.

Genus 4. *Caltha*, Linn.

1. *C. marginata*,⁶⁶⁴ sp. nov.

A small tufted, rather slender, glabrous perennial herb; rootstock thickish, with a few (6) radical leaves, and short 1-flowered scape. Leaves spreading; blade green, 4–5 lines long, broadly elliptic, much-veined, deeply emarginate, largely cordate and auricled at base, with the obtuse auricles turned up and closely appressed to the surface of the leaf; margins broadly cartilaginous and pale, irregularly and distantly crenulate; petioles brownish, $\frac{3}{4}$ in.–1 in. long, dilated at base into large; membranous sheaths. Flower $\frac{3}{4}$ in.–1 in. diameter; scape half as long as petioles, stoutish, dark-brown. Sepals 5, linear acuminate, margined, purple on the outside, pale-yellowish within, margins thickened, white. Stamens few, short; anthers elliptic. Carpels few; style short, stout, shining, slightly hooked.

Hab. On secondary summits of Ruahine Mountain-range, east side, County of Waipawa; 1890: *Mr. A. Olsen*.

Obs. A species evidently closely allied to *C. novæ-zealandiæ*, Hook. (discovered by me on the same range, but much higher up); but this is a smaller plant, and differs in several characters: as in the shape of its leaves, which are also crenulate and largely margined, their

664 Possibly *Caltha novæ-zelandiæ*.

cartilaginous margins being conspicuously pale; in its narrower and purple sepals, which are also margined; and in its fewer stamens. [383]

Order XXII. LEGUMINOSÆ.

Genus 1. Carmichaelia, Br.

1. *C. suteri*,⁶⁶⁵ sp. nov.

A very dwarf, glabrous, slender, twiggy shrub, 2 in.–2½ in. high, with numerous close-curved and erect, forked, and simple branchlets 1 in.–1¾ in. long, $\frac{1}{20}$ in. wide, compressed, narrowly sulcated, tips obtuse, with small broadly-triangular scale-like bracteoles at lateral notches on stems, acute, pale and sub-ciliated. Leaves not seen. Flower solitary (large for plant), 4 lines long, “red-violet (turning somewhat greenish in drying).” Peduncle (proper) 2 lines long, slender, glabrous, pale, jointed on to a green stalk 3–4 lines long. Calyx-teeth large, broad obtuse, tips black, the margin between them slightly ciliolate, with 2 small distant bracteoles appressed at base, their edges cilio-fimbriate. Standard broadly orbicular, 2½ lines wide, slightly notched; wings large oblong, their tips broad rounded; keel sub-orbicular (expanded), tip very obtuse, deeply notched; ovary glabrous; style penicillate. Pod large, sub-oblong-lanceolate oblique, 7½ lines long (including beak), nearly 3 lines broad, corrugated; beak 1 line long, straight, sometimes slightly curved, acute. Seeds 7, small,

665 *Carmichaelia uniflora* Buchanan.

reniform, sub-terete, smooth, symmetrical, unicoloured, pale dusky-purplish.

Hab. South Island, "near Mount Cook Hermitage, alt. 2,540 ft.!; creeping upwards over stones amongst tussocks;" *Mr. H. Suter*, in lit., 1890.

Obs. A delicately-formed small species, nearly allied to *C. uniflora*, Kirk, but differing from that species in its much larger flower and pod, glabrous peduncle, obtuse black calycine teeth, &c., the pod being the largest of all the species known to me. It is named after its kind and liberal discoverer, Mr. Suter, a skilled scientist, who also, during his short sojourn there at the Hermitage, discovered several other small and interesting alpine plants, some of them being also described in this paper.

Order XXIII. ROSACEÆ.

Genus 4. *Acæna*, Vahl.

1. *A. macrantha*,⁶⁶⁶ sp. nov.

Herb perennial, prostrate and sub-ascending, much-branched; main branches and root stout, woody. Leaves numerous, 2 in. long, obovate (in outline), imparipinnate, membranaceous, dark-green; leaflets 5 pairs, distant, glabrous above, slightly strigosely hairy on midrib below; the upper pairs sub-sessile, broadly oblong, deeply serrate, tips truncate 3-toothed; lower pairs very small, sub-orbicular, [384] petiolulate; petiole $\frac{1}{2}$ in.–1 in. long, hairy, base much dilated, with a pair of long

666 *Acæna novæ-zelandiæ* Kirk.

spreading linear bracts (or stipules) at upper corners—one at each corner. Peduncle naked, stout, erect, striate, sub-angular, red, $2\frac{1}{2}$ in.—3 in. long, hairy; hairs white, appressed; sometimes a very small leafy bracteole midway, very rarely two. Heads globular, 1 in. diameter. Flowers dark-green; calyx-tube densely woolly-hairy; hairs long, white, 4 erect stout spreading spines, 1 at each corner, dark-red, glabrous, shining, 5—6 lines long, tips barbed, barbs white, with 4 (or more) rays. (The spines at flowering are shorter than the corolla, but soon gain their full length.) Petals 4, large, glabrous, oblong-lanceolate, spreading, 3-nerved, tips thickened, sub-acute and sub-apiculate; margins and tips becoming red in age. Stamens 2, slender, curved, largely exserted (also style); anthers small, globular, bright-yellow. Style large, stout, dilated, pinnatifid-plumose. Receptacle very small, sub-hemispherical, muricated.

Hab. On open plains, Tahoraiti, south of Dannevirke, County of Waipawa; 1886-90: W.C.

Obs. A species remarkable for the dark-green colour of its leaves and large petals; also, the deep red (port-wine colour) of its large heads of stout glabrous glistening spines, which give it a striking specious appearance, and serve to distinguish it from its congeners at first sight. It also grows much more compactly together than the allied indigenous common species, and is a scarcer plant.

Order XXVI. DROSERACEÆ.

Genus 1. *Drosera*, Linn.

1. *D. flagellifera*,⁶⁶⁷ sp. nov.

Plant small, slender, gregarious, perennial; roots long, thickish. Leaves few from one plant radical, erect, 1½ in.–2 in. long, scarcely 1 line wide, linear very acuminate, forked, often twice forked; circinnate in growth, glabrous below, very glandular above; glands red, sessile on upper surface, with long irregular stalks at margins, and very long at tips of leaves. Petiole slender, 2 in.–3 in. long, glabrous, reddish-green. Scape very slender, 8 in.–10 in. high, erect, glabrous, red. Flowers at top, 9–12 in a small branched cyme of 2–4 branchlets, usually 3 on a branch; pedicels 2–3 lines long, with a long linear bracteole, its tip truncate and laciniate, curled and appressed at the base of each branchlet. Calyx half as long as corolla, dark-green (black when dried), finely muricated or sub-rugulose; lobes oblong, truncate, largely and unequally laciniate, 3-nerved, nerves much-branched above. Corolla spreading, flat, 8 lines diameter, white (when fresh); petals distant, slightly concave, very membranous, sub-obovate, much [385] truncate, the margins of tips crenulato-denticulate. Stamens 5; anthers orange-coloured. Styles 5 (or more) much-branched and forked, their tips (stigmas) irregularly shaped, broad, obovate, cuneate, lobed, emarginate, obtuse. Fruit, immature.

Hab. Margins of streamlets, low open grounds, south of Dannevirke, County of Waipawa; December, 1890: W.C. (Apparently very local.)

667 *Drosera binata* Labill.

Obs. A species allied to *D. binata*, Lab. (an Australian plant), but certainly distinct in many important characters; very much so from the plate of that species with dissections given in "Nov. Holl. Plant." Also, from description of the northern form of *D. binata*, as given in the "Flora Nov. Zel.," which plant (writing from memory of it) is a much larger and stouter one. This plant in drying stains the papers used red.

Order XXVIII. MYRTACEÆ.

Genus 2. *Metrosideros*, Br.

1. *M. aurata*,⁶⁶⁸ sp. nov.

Young branches terete, glabrous (as, also, leaves); bark reddish, slightly and closely rugulose or wrinkled. Leaves oblong- and sub-oblong-lanceolate, obtuse, 1 in.- $1\frac{1}{4}$ in. long, 5-6 lines broad, decussate, light-green, erect, slightly spreading, sub-coriaceous, shining; margins thickened and recurved; profusely and irregularly covered with circular glandular dots of 2 sizes, some of them dark-red on the under-surface; veins diagonal, sub-parallel, distant, indistinctly forked near margins; midrib stout, flattened below, not prominent; petioles short, $\frac{1}{10}$ in. long, stout, red, glabrous, sub-rugulose, swollen at base. Flowers terminal on tips of branches, erect in small loose cymes of 7-12, the outer ones usually 3, and 2, together, sometimes solitary as the others; peduncles decussate, 2- $2\frac{1}{2}$ lines long, with a pair of very small leaflets at base; pedicels short or 0, the calyx-tube

668 *Metrosideros scandens* (Forst.) Druce.

(ovary) gradually forming them. Calyx-tube infundibuliform, 6–8 lines long, sub-terete, obsoletely ribbed, pale-green with a yellowish tinge, glabrous; lobes 5, large, sub-orbicular, concave, yellowish-green, glandular dotted; margins membranous and minutely denticulate. Petals yellow, large, sub-orbicular, concave, veined, minutely dotted with glandular dots; margins finely and closely lacinio-ciliolate; scarcely clawed but thickened and obsoletely veined at base. Stamens numerous, very slender, sub-½ in. long, terete, wavy, spreading; at first expanding yellow, but soon becoming light-red; anthers small, oblong, yellow. Style longer than stamens and much stouter, terete, tawny-reddish-yellow; stigma slightly sub-capitate and narrowly margined, ovary deeply sunk within calyx-tube, indehiscent. [386]

Hab. “Collingwood”; 1890: Communicated by *Mrs. S. Featon.*

Obs. This peculiar and elegant flowering species of *Metro-sideros* I lately received (with other botanical specimens) from Mrs. S. Featon, of Gisborne, who had then recently obtained it from Collingwood. It is allied to *M. florida*, Sm., but differs from that species in several characters,—besides those striking ones of its yellow petals and their sub-laciniate margins. In outline its petals approach those of *M. robusta*, A. Cunn.; but these of this species are more largely veined and dotted. Specimens bearing mature fruit are much desired.

Order XXXIII. UMBELLIFERÆ.

Genus 1. *Hydrocotyle*, Linn.

1. *H. nitens*,⁶⁶⁹ sp. nov.

Plant perennial, small, creeping, forming dense spreading mats; stems slender. Leaves glabrous, shining, green, broadly orbicular, 2–3 lines wide, basal sinus deep, 5-nerved, 6-lobed; lobes imbricate above, each 3-crenate-toothed; teeth large, broad, and sub-acute; sinuses shallow, their bases rounded and clear; petiole 1 in.–1½ in. long, erect, with a few weak long hairs at top close under leaf, usually 1 leaf and 1 peduncle rise from each node, about 1 in. apart on the stem. Stipules membranous, broadly triangular, margins entire, pale-brown. Peduncle slender, erect, nearly as long as petiole, glabrous. Umbel 5–8 flowered; flowers shortly pedicelled, pedicels increasing in length in fruit. Involucre 5 short oblong concave scales, their tips rounded, with 1 smaller similar scale at the base of each pedicel. Petals dark-pink, oblong, concave, tips rounded, incurved. Styles long, deflexed, diverging. Fruit very small, oblate-globular, turgid; mericarps $\frac{1}{20}$ in. diameter, 1 rib on face, back sub-acute; commissure deep; light-brown.

Hab. Forming large close-growing patches, or beds, sides of streamlets in plains, and in low shaded woods, near Dannevirke, County of Waipawa; 1887-90: W.C.

Obs. A very pleasing plant in its general appearance, from its numerous small neat and regular close glossy green leaves.

Genus 2. Pozoa, Lagas (*Azorella*, Lam.).

669 Possibly *Hydrocotyle americana* L.

1. *P. (A.) elegans*,⁶⁷⁰ sp. nov.

A small perennial delicate herb of compact growth, densely tufted; stems simple, erect, slender, striate, succulent, glabrous, 3 in. high, sometimes (but rarely) shortly proliferous. Leaves radical, 2–3 foliolate, 1 in.–1½ in. diameter; leaflets orbicular, 4–6 lines diameter, thin, obscurely 3-4-lobed, roundly [387] crenate, margins cartilaginous; petiolules slender, 3 lines long; stipules large, broad at base, much fimbriate; petiole (also scape) slender, 2 in.–2½ in. long, pale-green. Peduncles 4–5 lines long, stoutish, springing from top of petiole under leaf. Umbels 2–3, in round heads 20–30-flowered; pedicels 1 line long. Involucre many-leaved, leaves long linear, 1-nerved, tips very obtuse, involute. Flowers rather large for plant, showy, dark-purple; petals sub-obovate; rhomboid, tips acute; calycine lobes similar in shape, but much smaller. Stamens long, incurved; anthers globular. Fruit (immature) slightly ribbed.

Hab. South Island: “Sealy Range, altitude 6,000 ft., the complete plant forming a big bunch or rosette with many flowers.”—*Mr. H. Suter*, in lit., 1890.

Obs. This is evidently a very pretty and symmetrical little alpine plant, differing much in general appearance from the other described species, but possessing affinity with *P. trifoliolata*, Hook., also with *P. microdonta*, mihi, here following. I have received four good specimens from its kind discoverer, all very much alike, which (he says) he “got from one plant.” To be in keeping with the genus in the “Handbook, Flora N.Z.,” I retain *Pozoa*, though I

670 *Schizeilema haastii* (Hook.f.) Domin var. *haastii*.

prefer *Azorella*, to which older genus Bentham has removed it.

2. *P. (A.) microdonta*,⁶⁷¹ sp. nov.

Plant perennial, very slender, glabrous; stem 1 ft. (or more) long, filiform, prostrate, creeping, purplish, rooting at nodes 2 in.–3 in. apart; roots very long, capillary, white. Leaves 2–6 at each node, erect, 3-foliolate; leaflets equal, distant, divergent at right angles, sub-oblate-orbicular or sub-flabelliform, each 3–4 (sometimes 6–7) lines diameter, margined, minutely and regularly serrulate under lens; tips truncate and unequally cut and 5–6 crenate-lobed; lobes rounded, each mucronate at extremity of vein, 3-nerved, green, membranous, soft, much-veined, with a few scattered white succulent erect hairs on veins of upper surface and at margins; petiolules 1½–2 lines long; petioles slender, 3 in.–5 in. long, purple, channelled. Stipules small, with 3–4 rather long and stout succulent ciliæ. Peduncles springing from common petiole, one-third below leaflets, sometimes 2–3 from one point, ½ in.–1¼ in. long. Umbels (sometimes two unequal umbellules) 2–4- (rarely 6–10-) flowered, their stems stout. Involucral leaves 1–2 lines long, linear-ovate acuminate, lacero-ciliate. Flowers small, shortly pedicelled, 1½ lines diameter, calyx and petals forming a regular star; calyx-teeth small, membranous, broadly triangular, abruptly acuminate. Petals distant, spreading, very membranous, narrow sub-rhomboidal, abruptly acuminate, acute, with sometimes a [388] minute irregular lobe, or tooth, at lateral angle, 1-nerved,

671 *Schizeilema trifoliata* Domin.

margins minutely sinuate-crenulate, whitish, purple-dashed. Fruit oblong, turgid, ribs obsolete.

Hab. Forming large close-growing patches, or little beds, wood south of Dannevirke, County of Waipawa; October, 1889-90: W.C.

Obs. A species near *P. trifoliolata*, Hook. (to which I had, at first discovery, assigned it), but very distinct in several characters, in both leaves and flowers.

Order XXXIX. COMPOSITÆ.

Genus 9. *Cotula*, Linn.

1. *C. venosa*,⁶⁷² sp. nov.

A slender weak sub-erect herb, clothed with long fine silky white hairs, especially on young leaves and flowering stems, 6 in.-8 in. high; generally with 1 main slender stem below, much-branched above; roots long and filiform. Leaves few, distant, scattered mostly on the lower parts of branches, $\frac{1}{2}$ in.- $\frac{3}{4}$ in. long, broadly oblong or obovate in outline, pinnatifid with 2-3 pairs of lobes on sides; lobes sub-lanceolate, simple, entire, sometimes with 1 small lobule on the upper edge of the larger lobes; margins thickened; tips acute, sub-mucronate, thickened, white; the apical portion of the leaf broad, 3-lobed, lobes equal; much veined, also the winged rachis and petiole; veins intramarginal; 2 pairs of small lobe-like stipules at base of petiole. Heads small, 2 lines diameter, spreading, solitary, terminal on long slender naked peduncles or tips

672 Possibly *Cotula australis* (Spreng.) Hook.f.

of branches, 3 in.–4 in. long, simple, erect, 2–5 rising from a main branch. Involucral scales sub 2-series.

Scales broadly oblong, the centre green, with a strong percurrent central nerve, and other nerves branching, their margins being very large membranous pellucid white, delicately and closely reticulately veined; edges of tips minutely sub-sinuate denticulate, soon becoming black. Rayflorets in two rows, pedicelled; corolla 0; achene obovate, apex simple retuse; a few fine short hairs in the centre on both sides; margins thick, broad, glabrous; styles spreading. Disk-florets cylindrical, 4-toothed; teeth broad, eglandular; pedicels long.

Hab. Forming small patches in open woods south of Dannevirke, County of Waipawa; 1890: W.C.

Obs. A species very near to *C. australis*, Hook., but differing from that plant in several particulars: as in its great hairiness, in the smaller size shape and markings of its leaves, in its larger heads, in its different flowers and achenes, and, particularly, in its beautiful and curious involucral scales. [389]

Order XLII. ERICEÆ.

Genus 2. Pernettya, Gaud.

1. *P. nana*,⁶⁷³ sp. nov.

A small low shrub of matted growth; main stems prostrate under ground, implexed, slender, woody, rooting, blackish; branches numerous, short, $\frac{3}{4}$ in.– $1\frac{1}{2}$ in.

673 *Stet.*

high, erect, simple, sometimes (but rarely) forked, glabrous. Leaves few, small, rather distant, alternate, petiolate, oblong-lanceolate sub 2 lines long, obtuse, thickish, glabrous, dark-green above, paler below, their tips white, minutely mealy; lateral margins sub-sinuato-denticulate, usually having 2 minute obtuse teeth on each side (when young each with a minute patent hair at its tip), few-veined, veins white and mostly simple, and sometimes possessing the mealy appearance of the tips, as also the teeth; petioles short, stoutish, red. Flowers (large for plant) terminal at tips of branchlets, 3–4 together sub-corymbose; peduncle sub 2 lines long, stout, glabrous, thickened at top, 2–3 bracteolate at base, with a larger bracteole near the top. Calyx glabrous; lobes broadly ovate, acute, cut nearly to base, margined red and finely ciliolate, single-veined, enlarging with the fruit in its growth. Corolla white, broadly campanulate or cup-shaped, 3½ lines long, 3 lines wide; lobes short, their tips broad obtuse recurved, each triplinerved; stamens nearly exserted, anthers appearing at sinuses of lobes; filaments long (length of style), obovate acuminate, 1-nerved, white, slender, smooth, minutely and distantly tuberculate (*sub lente*); anthers oval, light reddish-brown, 2-awned; awns short, stout, spreading, sinus broad; style erect, stoutish, pink, persistent; stigma glabrous, slightly tuberculate. Hypogynous scales oblate-orbicular, emarginate. Fruit globular, minutely puberulent, 2 lines diameter, 5-grooved, angles rounded; the tip depressed, umbilicate; light-coloured dashed with pink streaks.

Hab. South Island: on the ground, hills near Mount Cook Hermitage; forming large patches, of densely compact growth; January, 1890: *Mr. H. Suter.*

CLASS II. MONOCOTYLEDONS.

Order I. ORCHIDÆ.

Genus 9. *Corysanthes*, Br.

1. *C. orbiculata*,⁶⁷⁴ sp. nov.

Plant small, 1 in.–1½ in. high, erect; a large sheathing bract at base of stem, and a long acute half-clasping one at base of ovary, 3 lines long. Leaf single, thin, 6–8 lines long, generally elliptic-cordate, sometimes somewhat broadly [390] cordate, lateral margins straight; tip rounded, apiculate; petiole short, 1–1½ lines long. Flower solitary; dorsal sepal thin, very long, ¾ in., lanceolate acuminate much overhanging, many-nerved; tip recurved; brownish-purple dashed on outside with linear purple dots; lateral sepals and petals narrow filiform, ½ in.–¾ in. (sometimes 1½ in.) long, sub-erect, 1 line broad and 1-nerved below; lip dark purple-red, orbicular, 4–5 lines diameter, apiculate, margin entire, but under lens minutely and regularly denticulate, much-nerved; nerves distant, forked at tips, and extending to margin. Ovary narrow-oblong, ½ in. long, striate, brownish.

Hab. South Island: "Mount Cook, Black-birch Creek Valley;" 1890: *Mr. H. Suter*.

Obs. Although I have received good dried and mounted specimens of this pretty little plant from its kind discoverer, they are not well fitted for minute microscopical dissection, having been too severely pressed. But this plant differs from our described New Zealand (and Australian) ones, in its thin elliptic and

674 *Stet.*

straight-edged leaf, and in the large orbicular and entire lip of its flower.

CLASS III. CRYPTOGAMIA.

Order I. FILICES.

Genus 5. *Hymenophyllum*, Sin.

1. *H. truncatum*,⁶⁷⁵ sp. nov.

Sub-prostrate, depressed, thickly overlapping, matted, quite glabrous; roots slender, creeping. Fronds 1½ in.–2 in. long, broadly ovate and sub-deltoid, of a pleasing light-green colour (reddish-tinged in age), 3–4 pinnatifid. Pinnæ alternate; main rachis and secondary rachises much-winged; wings crisp; segments numerous, close, linear, sub-secund, inclined below surface of rachises, serrate; serratures large, distant, blunt; tips truncate, dilated, 2–3-toothed, sometimes forkveined and emarginate; veins not extending to margins. Cells dusky, distinct, irregular, of various shapes and sizes, with wide darker intercellular passages between; their centres pellucid, irregular in shape; larger by sides of veins, and very small and more regular in form and compact at margins, giving the segments a thickened sub-marginal appearance. Stipe 1 in.–2 in. long, dark-brown (also rachis and secondary rachises), narrowly winged to base, with scattered red hairs when young; involucres few on frond, confined to upper pinnæ, usually solitary, or 2 (rarely 4–5) on a pinna, and only showing on the upper side, full, supra-axillary, very large, broadly sub-

675 *Hymenophyllum multifidum* (G. Forst.) Sw.

orbicular, or orbicular-flabelliform, paler green than and of different substance from the frond; valves large, free [391] three-fourths of their length, vertical, their upper portion usually curved and compressed while young, but afterwards gaping; margins entire and sub-sinuate; cells distinct, irregular in size, but mostly quadriform (parallelogrammic), disposed in longitudinal parallel lines, their centres dusky, their edges thickened, dark. Receptacle small, included; capsules few at the base.

Hab. Plentifully on the trunk of a large tree, in a thicket, south of Dannevirke, County of Waipawa; 1887-90: W.C.

Obs. I. This fern has caused me a deal of labour and research, extending over several years, arising from my never having detected it bearing fruit until this year (1890). In some of its characters it is allied to *H.*

multifidum, Sw., but in others it is very distinct from that species as described and especially from that of the typical specimen with illustrations and dissections, given in Hook. and Greville's "Icones Filicum;" its fruitful fronds are very rare.

II. If I mistake not, I found this same fern 40-45 years ago in the *Fagus* woods on the secondary western summits of the Ruahine Mountain-range, completely covering the ground with its thick perennial matting. I assiduously sought for fruiting specimens on every journey thither, but was always unsuccessful.

[Mounted specimens of all these plants were also shown at those two meetings.—W.C.]

**1890 An enumeration of the fungi recently
discovered in New Zealand. *Transactions of the
New Zealand Institute* 23: 391-398.**

[*Read before the Hawke's Bay Philosophical Institute,
14th November, 1890.*]

IN the autumn of this year I again sent a lot of Fungi to Kew, London (with other plants, both Phænogams and Cryptogams), which I had discovered at various times during the last four years in my visits to the dense forests and deep glens of the Seventy-mile Bush district, County of Waipawa; a few of them also being from Napier.

Several of them were forms that were new to me, although I knew some of their genera and allied species. Altogether they numbered nearly one thousand separate packets, containing also a much larger number of specimens, but several were duplicates, and, indeed, three to four times repeated, having been obtained in [392] different states, at different seasons of the year; and while some of them were common (locally), others were extremely rare.

I sent them to Kew, to the Director of the Royal Botanic Gardens, Mr. W.T. Thiselton Dyer, C.M.G., &c., in order to get them determined, if possible, by the eminent fungologist, Dr. Cooke, who had so very kindly done so much for some former lots, collected in the same localities. I have very recently received from the Director at Kew a long and complete valuable list of a portion of the same (those already determined), and this I purpose now laying before you, omitting only those species which were already known, and described in the "Handbook,

Flora of New Zealand," and also in my two supplementary papers of newly-discovered Fungi published in vols. xvii. and xix. of the Transactions. And, as on former occasions, I shall classify them thus:—

1. Foreign Fungi, already described, but not before found in New Zealand.
2. Indigenous species wholly new to science, true *species novæ*.

From these lists you will learn that, out of the large number of specimens of Fungi last sent by me to Kew, a total of 132 species are new to the New Zealand flora, and of these only five species have been determined as new to science.

FUNGI.

Section I.—FOREIGN FUNGI ALREADY DESCRIBED, BUT NOT BEFORE FOUND IN NEW ZEALAND.

(1.) *Of Genera⁶⁷⁶ known to inhabit New Zealand, as published in the "Handbook."*

Genus 1. Agaricus.

1. A. (Lepiota) mesomorphus, *Bull.*
2. A. (Tricholoma) rutilans, *Fr.*
3. A. (Omphalia) stellatus, *Fr.*
4. A. (Omphalia) anthiceps, *B. and C. prox.*
5. A. (Omphalia) fibula, *Fr.*
6. A. (Pleurotus) applicatus, *Fr.*

676 WC: The numbers attached to genera in this list are those of the same genera "Handbook, Flora of New Zealand."

7. A. (*Pleurotus*) algidus, *Fr.*
8. A. (*Pleurotus*) guilfoylei, *B.*
9. A. (*Pleurotus*) salignus, *Fr.*
10. A. (*Pleurotus*) flabellatus, *B. and Br.*
11. A. (*Pleurotus*) subsupinus, *B.*
12. A. (*Pleurotus*) scabriusculus, *B.* [393]
13. A. (*Pleurotus*) tasmanicus, *B.*
14. A. (*Pholiota*) mutabilis, *Fr.*
15. A. (*Pholiota*) pudicus, *Fr.*
16. A. (*Flammula*) tilopus, *Kalch.*
17. A. (*Flammula*) chrysotrichus, *B.*
18. A. (*Flammula*) hyperion, *C. and M.*
19. A. (*Naucoria*) temulentus, *Fr.*
20. A. (*Naucoria*) semiorbicularis, *Fr.*
21. A. (*Naucoria*) melinoides, *Bull.*
22. A. (*Naucoria*) fraternus, *C. and M.*
23. A. (*Naucoria*) nasutus, *Kalch.*
24. A. (*Collybia*) nummularius, *Fr.*
25. A. (*Collybia*) distortus, *Fr.*
26. A. (*Collybia*) laccatinus, *B.*
27. A. (*Collybia*) velutipes, *Fr.*
28. A. (*Crepidotus*) mollis, *Fr.*
29. A. (*Paneolus*) fimiputris, *Fr.*
30. A. (*Mycena*) atrocyaneus, *Fr.*
31. A. (*Mycena*) epipterygius, *Fr.*
32. A. (*Galera*) tener, *Fr.*
33. A. (*Armillaria*) melleus, *Fr.*

Genus 2. Coprinus.

1. C. micaceus, *Fr.*

Genus 3. Hygrophorus.

1. H. niveus, *Fr.*
2. H. miniatus, *Fr.*

Genus 4. Marasmius.

1. M. vaillantii, *Fr.*
2. M. spaniophyllus, *B.*
3. M. exocarpi, *B.*

Genus 5. Lentinus.

1. L. zealandicus, *Sacc.*
2. L. lepdeus, *Fr. affinis.*
3. L. hepatotrichus, *B.*

Genus 7. Panus.

1. P. tahitensis, *Reich.*
2. P. incandescens, *B.*

Genus 10. Polyporus.

1. P. squamosus, *Fr.*
2. P. latus, *Cke.*
3. P. grammocephalus, *Berk.*
4. P. leprodes, *Rost.*
5. P. (Hispidi) setiger, *Cke.* [394]

Genus 13. Hydnum.

1. H. niveum, *Fr.*
2. H. coralloides, *Fr.*
3. H. udum, *Fr.*

Genus 15. Thelephora.

1. T. fastidiosa, *Fr.*

Genus 16. Stereum.

1. S. ochroleucum, *Fr.*

2. S. pannosum, *Cke.*
3. S. illudens, *B.*

Genus 17. Corticium.

1. C. ochraceum, *Fr.*
2. C. sulfureum, *Fr.*
3. C. auberianum, *M.*
4. C. scutellare, *Fr.*
5. C. nudum, *Fr.*

Genus 18. Cyphella.

1. C. alboviolascens, *Fr.*

Genus 20. Clavaria.

1. C. misella, *B. and C.*
2. C. contorta, *Fr.*

Genus 25. Secotium.

1. S. czerniavii, *Mont.*

Genus 30. Lycoperdon.

1. L. sericellum, *B.*
2. L. gunnii, *B.*

Genus 46. Puccinea.

1. P. lychinidearum, *Lk.*
2. P. violarum, *Lk.*

Genus 47. Uredo.

1. U. compositarum, *v. celmisiæ.*

Genus 51. Stilbum.

1. S. vaporarium, *B. and Br.*
2. S. pellucidum, *Schr.*

Genus 60. Peziza.

1. P. margaritacea, *B.*

2. P. sarmentorum, *B.*
3. P. (Lachnea) cubensis, *B.* [395]

Genus 65. Asterina.

1. A. effusa, *Cke. and Mass.*
2. A. subcuticulosa, *Cke.*

Genus 68. Hypocrea.

1. H. citrina, *Fr.*

Genus 69. Xylaria.

1. X. allantoidea, *M.*
2. X. zelandica, *Cke.*

Genus 70. Hypoxylon.

1. H. coccineum, *P.*

Genus 74. Sphæria.

1. S. mammæformis, *P.*

Genus 77. Erysiphe.

1. E. communis, *Lk.*

(2.) *Of Genera first published in "Transactions N.Z. Institute," vols. xvii. and xix.*

Hymenochæte.

1. H. kalchbrenneri, *Mass.*
2. H. tabacina, *Fr.*
3. H. mougeotii, *Fr.*

Calocera.

1. C. stricta, *Fr.*
2. C. guepinoides, *Fr.*

Trichia.

1. T. superba, *Mass.*

Mucor.

1. M. phycomyces.

Helotium.

1. H. sublenticulare, *Fr.*
2. H. claroflavum, *Gr.*

Polystictus.

1. P. sector, *Ehr.*
2. P. sanguineus, *Fr.*
3. P. tabacinus, *Mont.*
4. P. hirsutus v. cinerascens, B.

Rossellinia.

1. R. mammoidea, *Cke.* [396]

Hemiarcyria.

1. H. rubiginosa.

Poria.

1. P. hyalina, *B.*, var.
2. P. corticola, *Fr.*

(3.) Of Genera not before found in New Zealand.**Sphaeridium.**

1. S. candidulum, *Sacc.*

Sporidesmium.

1. S. lepraria, *B.*
2. S. polymorphum.

Pistillina.

1. P. stilboidea, *Cke.*

Dactylium.

1. D. macrosporum, *S.*

Coleosporium.

1. C. fuchsiæ, *Cke.*

Lophadermium.

1. L. culmigenum, *Fr.*

Aleurodiscus.

1. A. oakesii, *B. and C.*

Trametes.

1. T. epitephra, *Berk., var.*

Physarum.

1. P. leucopus, *Fr.*

2. P. lividum, *Rost.*

Fusarium.

1. F. elongatum, *Cke.*

Merulius.

1. M. corium, *Fr.*

Gibbera.

1. G. pulicaris, *Fr.*

Illosporum.

1. I. carneum, *Fr.* [397]

Cintractia.

1. C. axicola, *Berk.*

Phyllachora.

1. P. junci, *Fr.*

Taphrina.

1. T. aurea, *Fckl.*

Cystopus.

1. C. candidus, *Lev.*

Pleospora.1. *P. euonymi*, *C.***Trichoderma.**1. *T. viride*, *Fr.***Mylitta.**1. *M. australis*, *Fr.***Ramularia.**1. *R. obliqua*, *Cke.***Castoreum.**1. *C. radicum*, *Cke. and Mass.***Endothia.**1. *E. gyrosa*, *Fr.***Peniophora.**1. *P. velutina*, *Fr.***Spilocæa.**1. *S. pomi*, *Fr.***Section II.—SPECIES NOVÆ.***Asteromella myriadea.**Craterellus insignis.**Læstadia hepaticorum.**Uromyces azorellæ.**Uredo acacia.*

To these I add three *species* novæ lately described by me⁶⁷⁷ (as forming part of the aforesaid collection sent to Kew):—

677 WC: Trans. N.Z. Inst., vol. xxi., p. 79, and vol. xxii., pp. 451 and 458.

Hydnus novæ-zealandiæ, *Col.*
Geaster coriaceus, *Col.*
Peziza (Lachnea) spencerii, *Col.* [398]

Total number of additional species of genera known to inhabit New Zealand	100
Total number of species of genera hitherto unknown in New Zealand	27
Total number of indigenous <i>species novæ</i> (three of them belonging to genera not before known to exist in New Zealand)	5
Total number of species new to our New Zealand flora	132

Two striking facts will here immediately arrest our attention (the same, too, as were quite as noticeable on the former occasions above mentioned)—viz., (1) the large number of Fungi here in New Zealand that are identical as to both genera and species with those of England and other western countries, a few of them being almost cosmopolite; (2) the small number of truly indigenous *species novæ*. And that those Fungi that are at present undiscovered will still continue to be found bearing pretty nearly the same ratio I have little doubt.

Another fact worthy of notice is the large number of genera not hitherto known to inhabit New Zealand. From the preceding list it appears there are no less than twenty-nine genera new to this country, many of them at present possessing but a single species; yet, as several of those genera contain a large number of species in other lands, it is but reasonable to suppose that the number of each genus will be largely augmented here.

1890 Bush notes; or short objective jottings.

Transactions of the New Zealand Institute 23: 477-491.

[Read before the Hawke's Bay Philosophical Institute,
14th November 1890.]

'Tis in ourselves that we are thus and thus.

SHAKESPEARE.

1. On a Clear Pool of Water in the Thick Forest.

IT is a pretty and a pleasing sight to come suddenly on a deep pool of water in the dense still forest, especially on one formed in an excavation having steep sides, made by the side of the railway-line, with its pure smooth surface shining like a mirror, and clearly and faithfully reflecting the images of all branches and leaves and flowers of trees and shrubs, and of elegant drooping ferns overhanging its margins and growing around it. Early in the day, with the sun shining in the heavens, and its beams glinting down from the clear blue sky through the open spaces among the tall tree-tops, such a pool presents a ravishing spectacle, particularly when it possesses its natural delicate fringes of light-green floating fresh-water *Algæ*—*Confervæ* and *Oscillatoria*—bespangled with glittering [478] dew-drops And even this is sometimes increased (though rarely) while one is quietly looking on pleasurabley, and drinking in the scene, by the lighting-down of a dear little black-and-white forest bird⁶⁷⁸ on one of the pendulous branches, so that its image is also

678 WC: *Miro australis*, wood-robin.

reflected clearly in the watery mirror: perhaps it has come to quench its thirst, and will patiently wait until I retire ? And then, suddenly, on the falling of a leaf, or a flower, or a tiny twig into the pool, all is blurred and vanished as if by magic; but ere long, the day being calm, the pleasing scene returns, and affords a delightful object for contemplation. This is also further heightened by considering the foulness of the bottom of the said water, caused by thick deposits of rotten leaves, mud, &c, which, on being only slightly stirred, mar the whole. As Shakespeare quaintly and truly remarks,—

Roses have thorns, and silver fountains mud.

Just so it is with many of us. And, while thus contemplating and moralizing, his truthful and natural religious lines concerning the retired woodland life come rushing to the fore:—

And this our life, exempt from public haunt,
Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in everything.

Here I may mention that such a still pool of clear water was formerly used by the Maori chiefs as a kind of mirror, to show them the appearance of their own hair and heads when dressed with feathers, &c. And, of course, such a pool was sacred, and its water never used for any other purpose, unless it were to wash that *one* chief's head. Such pools have often served to remind me of the ancient poetical story of Narcissus.

I well remember in one of my early journeys at the north (in the “thirties”) stopping at a Maori village where I had never been before. I noticed a delightful little pool of

clear cold water in a rock-basin in the side of a rivulet in a sequestered spot in a thicket near by, and, being thirsty, I drank from it. This was seen by one of the Maoris of the place, who soon informed the others, and my transgression formed the subject of a long public debate as to what was to be done to me by way of retaliation, and what was I to pay as a fine or recompense. The water of that pool had never been drunk before by any human being, as it was the head chief's mirror-water. I got off, however, partly through my knowing a little of their language and their ways, and partly through my plea of being a foreigner and ignorant of the great sanctity of that dell: but there was much said about it—particularly my temerity, and its desecration, while some of them also waited to see the expected results (as in Acts, xxviii., 6).

[479]

2. On some Very Small Flowering Indigenous Spring Plants.

I have often been struck with the neat and pleasing appearance of several of our very small flowering plants inhabiting the high, open, stony plains in the early spring. These, though mostly perennial, are low, and cannot be detected from a little distance, looking over and across those long and broad flats. To a visitor at that season, so looking at the plains, with their small, stunted, withered herbage, they appear *prima facie* very dreary, and look still more cheerless than they really are when the blustering cold winds occasionally sweep over them in fitful blasts, soughing through the dry and dead stems of the last year's grasses. To discover their hidden floral beauties is no easy matter, particularly at this season of

the year; to do this one must wander into them, and sit or lie down, and peer closely about, even to the pushing-aside the slightly higher and coarser plants (small herbs and grasses not yet in flower) which overtop and conceal and preserve them—the lowly vernal flowering ones.

Some of those tiny flowering herbs form broad perennial patches or little beds, and sometimes, slightly-raised dwarf cushions; but they are generally very low and flat, seldom rising above $\frac{1}{2}$ in. from the ground; but all grow thickly intermixed, frequently revealing themselves, even when not in flower, or their flowers closed, as happens on a dull cloudy day, by the various colours and tints of their leaves, which range from very dark- to pale-green, bronze, brown, light-red, and dark-purple. A few of the more striking may be more particularly noticed.

One of them, which is sure on first seeing to attract the attention, is a minute and neat creeping species of *Epilobium* (the smallest of the many species of that genus found in New Zealand), with its numerous curiously-marked, close-set, regular, orbicular, yellowish-brown leaves, less than 1 line in diameter, and its small, erect, white, star-like flowers. Another is a thick-growing species of *Oxalis*, with its very small, almost crisped, compact leaves, and pretty yellow flowers. A minute, erect, tufted *Asperula*, with its curious bicuspidate leaves, and terminal white starry flowers always horizontal and gazing to the sky; of this genus I think there are two species to be found here, one being the *A. perpusilla*, of Hooker, which, he says, "is the smallest flowering plant in New Zealand. A little and peculiar half-rosulate species of *Ranunculus*, with its small spreading leaves forming a circle closely appressed to the ground, and its

attractive, shining, yellow, star-like flowers, of 5–6 petals, rather large for the little plant; and when the flowers of a score or a dozen of them closely growing together are displayed to the sun they present a lovely galaxy of floral beauty in the desert wild sure to evoke a word of praise. In [480] some sheltered hollows or small depressions in the soil a small variety of the graceful New Zealand Daisy (“that unassuming commonplace of Nature”) will here and there be sparingly seen, fully expanding its day’s-eye to the genial rays of the foster-parent sun. Here, too, may properly be placed a small and neat species of *Geranium*, which forms low, circular semitufted plants 3 in.– 5 in. diameter, their root-stocks very stout and branched, the branches very short, each with many small and neatly-cut leaves closely appressed to the soil; its few pale-coloured flowers, on very short scapes, modestly nestling in the centre. Another especial peculiarity of this plant (besides its very short flower-stalks) is the varying colours of its leaves—though all of one plant are of one colour—some being grass- others pale-green, others dark-brown, and others pale-fawn with reddish streaks. A minute *Myosotis*, scarcely exceeding 1 in. in height, and bearing yellowish terminal flowers, is sometimes to be met with, but it is rare. This little wee member of the blue-flowered “forget-me-not” family, with its strangely aberrant-coloured flowers, I first detected on the dry shelly banks by the sea-shore, near Farndon, forty years ago A small erect *Cardamine*, with minute pure-white flowers and dark-purple stalks, very likely identical with those of the Antarctic islets described by Hooker. A little spreading green and shining *Colobanthus*, with pale-green and white starry flowers. A

highly graceful and curious little *Leptinella* (or *Cotula*), with neat and regular pinnate leaves, and tiny heads of yellow flowers, forming thick matted beds, its long stolons creeping underground. To obtain only a fair specimen of this pretty little plant one must cut out a pretty large turf. I have good reasons for believing there are two distinct species of *Leptinella* here on these plains, but they are very much alike at first sight. Another and a similar plant as to its manner of growth (but not as to its foliage and flower) is a small species of *Nertera*. This plant grows together so densely as rarely to allow of any other growing among its intermixed and rooting branches. Its small and simple, close and concave leaves are almost vertical. Its pale-yellow flowers are dioecious and highly curious, and are large for the humble plant; they grow singly, and are produced clear above its leaves, and are extremely delicate. Its flowers much resemble those of the larger shrubby *Coprosma* genus, to which this genus is very closely allied. And yet another very similar plant as to its densely compact and matted manner of growth, and also in the form of its closely-set leaves, which are small and very regular, is a species of creeping *Gnaphalium*, which often forms low, close-growing, and tolerably large patches; its slender flowering-stems, however, which are erect, and appear later in the season, are 2 in.–3 in. high. [481]

The myriad flowers of all those little plants are all scentless, or nearly so; but not so these of the dwarf perennial *Leucopogon* that is found growing intermixed with them, but mostly in large, distinct, irregular patches, arising from its creeping underground roots. This is a dear little semi-shrubby plant, with needle-like tips to its

small, neat, close, and regular leaves, which have also minutely-serrulate edges (a beautiful object under a magnifying-glass), each short erect stem, or branch, of 1 in.–2 in. bearing many sweet-smelling flowers that sometimes form a little whorl, diffusing a delightful odour extending to some distance, and serving to betray its source. Wordsworth truly says, “The flower of sweetest smell is shy and lowly.” This dwarf shrub also bears a small dark-orange globular fruit (like a little fairy-like cherry), which is edible, and contains one wee stone. Another scented plant is the elegant-leaved umbelliferous *Oreomyrrhis*, which displays its dark-purple stems and pinnated leaves in a small radiating circle closely appressed to the ground, or more commonly to the fawn-coloured moss which closely invests it; these are always easily detected by their pleasing dark colour. The whole of this pretty plant is equally scented, and the odour, though strong, is not unpleasant. It is not, however, common, though perennial, and is mostly found scattered, yet sometimes several plants are found growing together.

All those plants (with many others) are generally accompanied by several small, thick-growing, tufted, and creeping mosses of various species, and forms, and colours, mostly barren, yet sometimes found in fruit; with here and there, occasionally, a small specimen of that curiously-formed plant and fern ally, *Ophioglossum*, with its single leaf and curious erect spike: all which greatly enhance the beauty of the humble and lowly floral scene.

To me, the meanest flower that blows can give
 Thoughts that too often lie too deep for tears.

Wordsworth.

There is still another and deeper consideration that finds its way into the intelligent botanist's mind when pondering over those little plants—viz., that the same or very similar species of some of these small and peculiar genera are only found in far-off isolated spots, distant also from each other—as the Andes from Mexico to Chili, Cape Horn and Fuegia, certain mountains in Australia and Tasmania, and those speck-like islets (Campbell's Island and Lord Auckland's Islands) in the Antarctic Ocean. The due and fair consideration of these facts serves to raise up thoughts almost boundless in the mind—thoughts, questions, seekings which cannot at present be reasonably solved. [482]

3. *On Some of our Indigenous Forest Birds.*

I have been much grieved of late in my visits to the forests to find scarcely any birds: in this respect so very different from what the woods formerly were, when they were gay with their company, and resounded to their melody and screams. Some species of the old familiar wood-denizens seem to have become quite extinct, as they are now never met with. During this extended visit of mine to the woods I have noticed only a few birds of three distinct kinds in the forests—viz., the *tuuii*, or parson-bird;⁶⁷⁹ the *kotare*, or kingfisher;⁶⁸⁰ and the

679 WC: *Prosthemadera novæ-zealandiæ*.

680 WC: *Halcyon vagans*.

piwakawaka, or flycatcher⁶⁸¹ —and very few indeed of these. On some days, and during some hours spent in traversing the woods, I have not observed nor heard a single indigenous bird. It is however, very pleasing to hear the deep and rich loud notes of a parson-bird perched high on a topmost and exposed branch of a tall tree—his favourite position when singing—especially at sunset, when it is as a call to vespers. Very likely its song is now considered the more melodious from its rarity. I am of opinion that the cock-bird sings to its mate when she is sitting in her nest hatching her eggs. It is a very pleasing sight to see a pair of them together diligently occupied in extracting honey from the tree-flowers, especially when the sun is shining on their glossy, submetallic, dark plumage. I have in former years seen two and three pairs together so employed in one small tree. On such occasions, if unobserved by them, and one keeps quiet, they may be pleasingly watched for some time, as their whole attention seems to be given to their sweet and profitable labour.

The kingfisher, being a shy bird, and generally making its nest in steep cliffs by sides of streams, is rarely seen at this season away from its breeding-place. I have seen more of them in my garden and fields on the hill at Napier, in the winter season, than I have ever seen together in the woods. At Napier they catch crickets, mice, &c., and are very serviceable. Mr. S.G. Brandon, of Meanee, once sent me a king fisher that he had found very recently dead in his paddock. It had a large mouse in its beak, a little more than half swallowed. No doubt the

681 WC: *Rhipidura flabellifera*.

living mouse had in its death struggles bitten and clawed and held on to the bird's throat, so that both had miserably perished together. Here, in the bush, I noticed a pair of them having their nest in a hole near the top of a tall dead tree denuded of its bark, that was at least 40 ft. high, and which stood at the edge of a wood by a small stream. A large bushy tuft of the long-leaved epiphyte [483] *Astelia* grew in the angle of a branch over the entrance. When their young were hatched it was quite a sight to see the parent birds continually flying down to the stream and returning with a small fish in their bills. On one or two occasions, when I timed them, each of the birds would go and return in about six minutes. I noticed they were not both absent together.

The interesting little flycatcher, with its monotonous sharp and short cry, which always seems to prefer making the acquaintance of man in the forest solitudes, I have seen but few of during this visit. By imitating its cry, or, rather, I think, the cry of its young, it will keep about one, gradually coming nearer and nearer, flitting from branch to branch, and incessantly displaying its tail-feathers. To me, when alone in the woods, this dear little bird is always welcome as a pleasing companion.

To know
That which before us lies in daily life
Is the prime wisdom.

Milton.

4. *On the Great Beauty of a Spider's Web.*

While standing in the doorway of a solitary outhouse here at Dannevirke, I noticed a large and perfect spider's web, which had been recently constructed by a species of

spider commonly called "the geometrical spider," from the extreme regularity of the concentric circles of its work. Smaller yet similar webs of the same kind I had often observed about the fences of my grounds at Napier; this one, however, was a very fine specimen, extending from the top corner of the open doorway to the eaves, and quite perfect, the part filled up with concentric circles or cross-lines being about 11 in. in diameter. Half the width of the web contained forty-five equidistant crosslines, each being about 1 line apart. It was cunningly and well secured by both long and short guys, while around the central portion, for about 1½ in., where the little architect was resting, was still unfinished. But the peculiar and attracting beauty of the structure arose from the manner of its appearance when the sun shone brightly and directly on it, every line displaying all the colours of the rainbow, glistening gloriously, which was also greatly increased by their slightly tremulous or minutely rippling motion. The sun's rays were prismatically divided and rendered, and their lovely microscopical refrangibility was very great—quite dazzling to the eyes. It was "a thing of beauty"—of natural beauty—to be seen, closely observed, admired, and never to be forgotten! I was so struck with it that I repeated my visits to the place to see it. I had before not unfrequently noticed a single line of spider's web briefly so acted upon by the rays of light, [484] but never on such a large and complete scale, neither so splendid nor so lasting as to colours. Something similar, though fainter and transient, may also be observed at times on filmy soap-bubbles, when blowing them. Truly the sight was a gorgeous one.

5. *On a Bat.*

On some fine evenings in August I was much pleased in watching the tortuous flittings of a bat, not having noticed one for many years. Here, at Dannevirke, in the township, in open spaces among the houses, the little creature seemed to enjoy itself. Yet, while it was quick in its flight, it repeatedly doubled, making only short zig-zag turns, with much irregular rising and falling—perhaps in its pursuit of insects flying, as its food. Formerly bats were not rare; indeed, they have been found in little flocks (or more properly, perhaps, a cluster) in our short winter season, securely hibernating in hollow trees in the woods. No doubt their present scarcity around our rural townships is owing to the extensive felling and burning of the neighbouring forests, in which they too were destroyed.

On two occasions about forty years ago I kept a bat in a cage in my dwellinghouse. One of them lived three or four weeks. It was a pretty little animal, with its velvet coat (reminding me of that of an English mole), bright black bead-like eyes, and very sharp and white teeth. It often amused us of an evening in the twilight, when it was taken out of its cage and allowed to fly about the sitting-room, which it fully explored, always dexterously avoiding coming into contact with the cross-beams or any article of furniture; now and then resting by clinging to the walls with its wings expanded. As these little creatures take their food (small living insects, on the wing) during their short irregular flights, and as there were none in the room, it was fed by hand with a few small flies, which it ate with avidity; but it was quite a

task for it to master a small bluebottle fly, making, too, such a ludicrous fuss over it in its chewing and champing! It always managed them better when their wings were taken off.

6. On the Great Docility and apparent Want of Fear of Man in Young Lambs.

It is always a pleasing and interesting sight in the spring, in the lambing season, to see the young lambs “frisking about by the sides of their dams.” Youth and age without cavil must equally take delight in witnessing this. When many ewes are together on the plains with their lambs, and all so very much alike, it seems as if it must be a difficult matter for each dam to know its own young ones, or for the young lambs [485] to know their own proper mother; yet they generally, if not invariably, manage very well on such occasions. Sometimes, however, in my going among them at this season (in my crossing the large level plain lying between Dannevirke and the woods on the Mangatera River), taking care to disturb them as little as possible, I have fallen in with a lonely pair of little lambs, twins (as is not unfrequently the case), who have somehow missed their dam, and then they are sure to make up to me, keeping step in their walking, and time in their little juvenile bleating. They follow at my heels, and come close up if I stand still, and look up and bleat so very affectingly, as if they said, “Where is our mother?” or “We want mother.” There was no mistake about it—no misunderstanding them. It has pained me more than once to have to drive them off from continuing to follow me like little dogs when I could not find their dam, fearing they might go further astray.

Sometimes I have endeavoured to find their dam for them, and, I own, not always with success; but when I have done so, and got the little family together, their joy was great and very apparent. In placing them, however, with the wrong mother, though apparently without a lamb by her side, she would not adopt them nor allow them to come near her; and this I think, they also well understood, as they would soon leave her and again come after me, bleating plaintively and looking so desolate! I have sometimes seen (but rarely) a ewe with three little lambs, triplets, at a birth. A very young lamb presents a rather curious appearance, for I have always noticed that the wool on its legs from the knees downwards was of a much lighter colour, perceptible also from a distance; its tail, too, being naturally long tends to alter its appearance, especially when frolicking. Another interesting feature is noticeable and striking in seeing the twin lambs lying down lovingly and close together sleeping in the sun, often in some grassy depression, or under a tuft of the common fern, their dam being some distance off grazing; and then, when disturbed in their nap by my approach, at first merely raising their little heads and looking around and stretching their legs, but afterwards rising and seeking their dam with noisy and quick bleats, and she, too, answering her children, their graduated cries no doubt being well understood between them.

Sheep have often been called silly stupid animals, and this from primitive times; hence we meet with such a descriptive line as this in the ancient comic Greek poet, Cratinus,—

And, like a stupid sheep; go crying, “Ba!”

Yet I have on different occasions noticed pleasing instances of their sagacity. One of them I will give: In those open plains already mentioned (as well as in many other similar [486] spots) stand a large number of cabbage-trees (*Cordyline australis*), the tii-tree of the Maori; but generally singly and scattered far apart. These often bear only a single head of long, narrow harsh leaves at the top of their tall slender stems, somewhat resembling a huge coarse mop; but sometimes they are slightly branched, their branches also only bearing a similar tuft of leaves at their tips: hence the amount of shade given by them when the sun is shining is but small, and of course the shadow moves around the tree according to the position of the sun in the sky. The sheep in the summer season—especially just before they are shorn, when their wool is thick, long, and heavy on them, and the sun is very hot on those plains—seek the scanty shade of the cabbage-trees; and I have often noticed a ewe and her lamb cuddled together in the small shaded spot, and by-and-by, as the shadow from the tree is moved, they also move with it around the tree. I have observed three such movements made in a few hours.

7. On the Dexterity and Industry displayed by Wood Rats or Mice in their extracting the Kernels of Small Nuts (Stones of Fruits) for Food.

Wandering in the neighbouring forest, I have been amazed at seeing the great number of empty shells of the nuts or stones of the fruits (*drupæ*) of the black-pine tree, the *miro* of the Maoris (*Podocarpus ferruginea*), strewed about on the ground. All, too, had been completely

cleaned from their fleshy exterior, which is by no means a pleasant or easy job (as I have found from experience), owing to its extreme stickiness, so closely adhering to one's fingers that soap will scarcely remove it. Those nut-shells had all been perforated at their hilum (their softer or thinner part where all alike was hard) in order to extract the small kernel, the little circular hole being about $1/10$ in. diameter. To gnaw away the hard shell sufficiently to get at, or to get *out*, the very small kernel must have been a work of incessant labour to the little animal—especially as it only works by night—increased from the small size and semi-orbicular shape of the nut itself (somewhat resembling a small cherry-stone), which must also have been securely held between its fore-paws to enable it to do so.

In one part of this wood near the rivulet was a little raised, dry, clear-topped mossy spot, extending a few feet each way, such small hillocks being not unfrequent in the hilly and much-broken woods (and just such a spot as would serve nicely for a small picnic party, with the high and robust umbrageous trees around it); and here especially the shells were very thickly strewed—much more so than around about among the ferns and herbs and low shrubs in the damper parts of the wood, where, too, the earth was bare in many [487] low places; so that it seemed as if the army of industrious workers had brought their spoils to that drier and softer spot, there to labour and feast at their ease in the cold nights. No doubt, to have seen and quietly observed them at work would have proved an interesting sight, and given us a good lesson in their natural animal economy. Thinking over this subject caused imagination to conceive some slight

analogy between (or, shall I say, the origin or cause of?) the humorous old Maori legend of the night-adventures of the chief Te Kanawa and the elves or fairies (*patupaiarehe*) in the forest, and this real animal objective scene, in which quaint story those numerous little merry folks played with Te Kanawa, and used him, much as the manikins of Lilliput did Gulliver. And so that old legend might have originated from a dream of Te Kanawa (who was sleeping on a dry mossy hillock in the forest) after quietly witnessing the dexterous feats of the wood-rats.

And here I may mention that fifty years ago, before the introduction of mice into this colony (or into the woody interior), I had often noticed with astonishment in my travelling through the forests the heaps of very hard, small, and stony nuts (*drupæ*) of the hinau-tree (*Elaeocarpus dentatus*) gnawed and perforated at their bases in a similar way, which the old Maoris said was done by the Maori rat, which animal we know once swarmed in those woods, and was fructivorous.

The black-pine, or miro, is the rarest of all the several species of pines in our New Zealand woods, and its scarcity may arise from its fruits being so eagerly sought for and devoured by those little animals.

8. On the Rapidity with which the Largest New Zealand Trees are felled and converted into Timber for various Uses.

Probably few, if any, of my audience have had the opportunity of witnessing the whole operation of felling a large timber-tree and cutting it up into planks and boards, as is now being daily done in the timber-forests of New

Zealand. To those who have not seen this great, this truly wonderful performance I would say, "Do so as early as convenient. It will give you new thoughts, exalted ideas of man's evergrowing powers over Nature *when working in concert with her.*" I will endeavour to give you in a few words an outline of what I have seen here at Dannevirke, though in this instance the best of words will prove wholly inadequate.

First, however, two things are necessary—that is, for *quick* work. The one is the erection, &c., of a steam saw-mill; the other, the formation of a tramway leading from the forest where the big trees grow to the mill. A tree (say, a fine, [488] robust, and tall totara pine, the glory of its forest) is selected, felled, its big and stately trunk is cross-hand-sawn into two or three lengths, as may be required. These logs are then rolled on to a kind of sleigh or tram-cart by the help of screw-jacks, and conveyed by horses to the mill. There they are soon placed (by screw-jacks, as before) under the central powerful vertical giant saw, and quickly cut up into clean squared timber of various large sizes, as beams, thick planks, &c. Smaller circular saws are also used, revolving very rapidly, and all working together at the same time and by the same steam-power, to reduce the beams and planks in size and thickness, to form them into boards, and to dress, and plane, and mould them as wanted. These are plain and smoothly planed, their edges "tongued-and-grooved," bevelled, moulded, &c. And all these are finished so rapidly, though it may be in long lengths (14 ft., 20 ft., 25 ft.), as to keep men constantly and briskly employed in taking them away from the benches, so that the operations may not be impeded. Other men are also kept

diligently at work removing the strippings or outer casings of bark and sap-wood, and in clearing out the ever-accumulating sawdust from the pits below under the saws. A prominent and surprising feature is the immense size of those piles or hills of outer sawn strippings in long lengths that are thrown away as worthless; and also of the sawdust that surrounds the mill on every side, sometimes overtopping in height the mill itself, and serving to embarrass the workmen; besides which there is also great danger from fire, particularly in the hot and dry summer months.

A few days ago, while at the mill, I witnessed the placing of the lower trunk of a handsome robust totara-tree, about 15 ft. long and 4 ft. in diameter, solid, perfect, and symmetrical, under the big vertical saw. It was soon fixed in position, and I watched the progress. The first cut (as is usually the case) was made down its centre longitudinally, and the immense log was carried steadily onwards at the rate of 10 in. per minute, as timed by my watch. Another remarkable feature is the smoothness and regularity of the surface of the sawn green timber, especially when the largeness, the coarseness, and the distance apart of the teeth of the saws are considered.

I believe it to be quite possible to fell a stately tree—the giant monarch of the forest—to haul it to the mill, and to cut it up into thin boards, “tongued-and-grooved,” and ready for use, within two hours. But, of course, all timber requires more or less of seasoning before it is finally used by the carpenter and joiner. Here the sap is seen gushing out of the wood under the saws. At the same time, I do not think the timber-trees of the New Zealand forests,

being evergreen, [489] require that particular attention as to the proper season of the year for felling them that our English timber-trees do, these latter—as the oak, ash, elm, &c.—being deciduous; for in the former the sap is always rising, while in the latter it is not so in the winter season.

I have intimated that some present may not have seen this timber work, and I may, I think, pretty nearly equally say that many of you have not seen or known the old, slow, and painful mode of proceeding with such work at Home or in this country. I, alas! have not only seen it done, but have tried my hand at it in order to get some boards from trees, when none were to be had, by arduous manual labour—a slow and laborious process. It was dear-bought experience; the unpleasant remembrance of it I shall never lose. I have called it “such work;” but that is not correct, save that boards were obtained from trees by hand-sawing. One might with equal justice compare the speed of a lighter propelled by oars with that of another worked by steam; or the tedious old Maori mode of procuring fire by friction with the modern instantaneous one by a match.

9. On Working-oxen.

My lodging at Dannevirke is close to the railway-station, and my sitting-room window commands the main road leading to it. An especial object of interest to me is a dray with five or six yoke of oxen coming along with a load to the station or taking one from it, as these generally come from a long distance across the country, where in many places there are no made roads. And this incident serves forcibly to remind me of what once obtained (thirty or

forty years ago) at Napier and the now settled districts of Hawke's Bay, with their present towns and boroughs, well-metalled roads, and bridges. Contemplating those oxen (generally twelve) in their ponderous dray, two things are highly prominent: (1.) The muddy state of the dray and its large high wheels, with the spaces between their spokes completely filled up level with the felloe with stiff hardened clay-mud securely fixed therein as if rammed, insomuch that it would be a difficult matter to dislodge any portion of it: This alone shows what kind of country they had come over or through, their tediously slow journey occupying in some cases several days. (2.) The calm and quiet demeanour and great docility of the oxen. There they patiently stand, alike in the hot sun, cold wind, or driving rain, one, two, or three hours, it may be, while the dray is being unloaded and reloaded with stores for the distant station. Sometimes, however, one of a yoked pair reclines on the ground, making it terribly disagreeable for its partner in the same unyielding and heavy yoke, now forcibly bowed down [490] at such a painful angle. But "all hands" alike are regularly "chewing the cud," with half-closed, sleepy eyes, in a dreamy kind of way, which seems to alleviate their heavy lot, if not their toil, and often serves to remind me of the use of tobacco by civilized man, especially as formerly practised, and particularly by old sailors.

Moreover, in my writing this I am reminded of a Scandinavian settler here at Dannevirke who has adopted the novel mode of working two oxen in a light dray-like cart, completely harnessing them as if they were horses (the oxen yoked to their drays having no harness at all).

Now, the having a bit in their mouths prevents the two poor animals from chewing the cud, and so these, being debarred from their natural habit, have no solace while standing still at loading or unloading, &c. I spoke more than once to the owner about it, pointing out the great natural difference between horses and cattle in the formation of their mouths, and their manner of eating, ruminating, &c.; but my doing so displeased him not a little. For my part, I cannot see that he gains anything by putting a bit into their mouths, as he does not use long reins—it can only serve for show. At the same time I should not omit to say that his two oxen look very well in condition, and are very docile. The harnessing of an ox or bullock within the shafts of a cart after the manner of a horse is not, however, wholly new in this colony, for I remember often seeing in the “forties” an ox so harnessed coming into Wellington with a settler and his family; but that had no cruel and irritating bit in its mouth.

But, of all the varied work and labour of oxen that I have ever seen, that of drawing out the large trunks of felled timber-trees through the thick, uncut, uncleared forest, without tracks, is to me the most astonishing. The incessant labour of both man (the driver) and beast is beyond all comparison—not to mention that of the faithful dog. At one time the pair of leaders, or the head or horn of an ox, at another the end of one of the yokes or the end of the log, gets jammed among the thick standing trees, and so “backing out” and clearing must take place before they can again move slowly on. Then, the multiplicity of words and of phrases used in all manner of tones (I don’t mean swearing), and the discordant barking the dog, now on this side of the oxen and now on

that—which somehow the patient animals seem to understand—at all events they mostly obey—is surprising. On one occasion, on witnessing a work of this kind in the dense forest, I asked the driver (a steady, hardworking, honest man, who was known to me) which he considered “required the most patience, the man or the ox.” He said he thought “both pretty nearly alike,” and I agreed with him. [491]

I may here also mention that I have seen a curious *lusus naturæ* while in the bush district this year—indeed, two that were very similar: one was that of a black cow with a young white calf, and the other a white mare with a sucking foal wholly black, presenting such a remarkable contrast. Piebald horses, some of them most strangely coloured, are pretty common about Woodville.

**1891 A Description of some Newly-discovered
Indigenous Plants, being a Further
Contribution towards the making known the
Botany of New Zealand.
Transactions of the New Zealand Institute 24: 387-
394.**

[Read before the Hawke's Bay Philosophical Institute,
12th October, 1891.]

CLASS I. DICOTYLEDONS.

Order XXVIII. MYRTACEÆ.

Genus 2.⁶⁸² Metrosideros, Br.

1. *M. tenuifolium*,⁶⁸³ sp. nov.

Plant diffusely creeping, very slender in all its parts, much branched, wholly glabrous; branches very long, flexuous, filiform, tetragonal, their angles slightly winged; bark bright-red, shining; rooting scattered, rootlets long wiry. Leaves distant, opposite, roundish and broadly elliptic, membranous, sub $\frac{1}{4}$ in. long, margins entire, flat, patent, pale-green above, greenish-white below, penninerved without an intramarginal line, glandular red-dotted on both surfaces; petioles very short. Flowers and fruit not seen.

682 WC: The numbers attached to the orders and genera in this and the following paper (Three New Ferns) are those of them in the "Handbook of the New Zealand Flora."

683 *Stet.*

Hab. Steep cliffy sides of streamlets and dry gullies, forests south of Dannevirke, County of Waipawa; 1889–91: W.C.

Obs. I. This plant grows very thickly in its peculiar habitats; adhering closely yet loosely to the dry soil, or rocks, which it overruns as well as itself, so that frequently no other plant is found growing among it; and when a specimen is sought to be gathered a large portion of the plant generally comes away with it. It looks strikingly pretty, from its numerous small and regular leaves and their clean and healthy appearance. I have frequently met with it during the last three years in those localities, and at various [388] seasons too; but never found it bearing either flower or fruit, in spite of all my researches.

II. This species is allied (though not very closely, judging from its leaves and branches) to *M. scandens*, Banks and Sol.; but that species has larger thick recurved sessile dark-green leaves, pubescent when young, glandular only on their lower surface, and tomentose branches.

Order XXXVIII. RUBIACEÆ.

Genus 1. *Coprosma*, Forst.

1. *C. alba*,⁶⁸⁴ sp. nov.

A much-branched thick bushy glabrous shrub, 10 ft.–12 ft. high; bark pale-brown, dull, roughish; branches largely spreading subhorizontal; branchlets numerous,

684 Possibly *Coprosma propinqua* A.Cunn.

close, opposite, flattish. Leaves small rather distant, sometimes two together, narrow linear-oblong very obtuse, sub $\frac{1}{2}$ in. long and 1 line wide, slightly curved, dark-green, margins coloured purple-red, much but obscurely net-veined; petioles short; stipules small, acute, glabrous, black-tipped. Flowers: *male*, axillary (often opposite on branches), and terminal on tips of short lateral branchlets, fascicled in threes; peduncle short, stout, curved, with a broad hemispherical scale at base of flowers. Calyx small, lobes deltoid-acute, dark-coloured. Corolla glabrous, whitish, purple-striped and purple-dotted on both surfaces, membranous, subpellucid, 4–5–6-lobed, cleft two-thirds down, much expanding, revolute; lobes subovate, tips suddenly contracted apiculate, minutely pulverulent within. Stamens 4–5, largely exserted, reddish; anthers large, oblong, obtuse, nodding, at first yellow afterwards of a greenish hue, their valve-margins delicately serrulate, the connective large thick minutely pitted with the tip slightly crested: *female*, solitary, scattered, at tips of very short lateral branchlets, mostly between two leaves. Calyx very small, 4-lobed; lobes acute, appressed, irregular 2 linear and 2 subovate. Corolla small, tubular, broadest at top; lobes 3–4, cleft half-way down, obtuse, conniving. Styles 2 (sometimes 3), 3 lines long, obtuse, pubescent, pinkish, diverging. Fruit globose, 2 lines long, crowned with persistent calyx-limb, white with minute purple dots, shining. Seeds 2, large, white, 2 lines long, broadly elliptic, slightly convex flattish, finely and closely laterally corrugated on the flat side.

Hab. On the eastern banks of the River Manawatu, near the new bridge, road from Dannevirke to Wainui, County of Waipawa, forming thickets; 1891: W.C.

Obs. This is a very distinct species: the male plant has a neat and even elegant appearance when in flower from their profusion; and so also the female when in ripe white fruit, [389] from their striking contrast to the dark-green of its foliage. It flowers in September, and bears, ripe fruit in April and May.

2. *C. turbinata*,⁶⁸⁵ sp. nov.

A much-branched erect shrub, 8 ft.–9 ft. high; bark smooth, shining, red-brown; branches suberect and spreading; branchlets opposite, numerous, slender, divergent at right-angles, their tips puberulent when young. Leaves small, 2–3 lines long, numerous yet rather distant in pairs, spreading, obovate, very obtuse, subcoriaceous; veins reticulate, obscure; stipules small, blunt, glabrous. Flowers: *male*, plentiful, 1–2–3 together, each single, subfascicled. Calyx (and corolla) glabrous, shining, small, 4-parted; lobes irregular, 2 long and 2 short, subdeltoid, obtuse. Corolla 4-cleft; lobes subovate, acute, recurved. Anthers large for flower, 4, exserted, nodding, linear-oblong, subapiculate, base sagittate: *female*, not seen. Fruit small, lateral, solitary, often opposite on branch, turbinate, 1–1½ lines long, yellow when ripe; peduncle short, stoutish. Seeds rather large for fruit, round, white, flattish, 1 line diameter.

685 *Coprosma rigida* Cheeseman.

Hab. Sides of streamlets, edges of woods, south of Dannevirke, County of Waipawa; 1890–91: W.C.

Obs. This shrub has a general resemblance to the preceding species, *C. alba* (although it is a much smaller plant, with smaller and differently-shaped leaves), also to *C. aurantiaca*, Col. (Trans. N.Z. Inst., vol. xxii., p. 464), but differs in several characters from both, especially in its fruit. Female plants, that were loaded with fruit last autumn, had not a single flower on them this spring, although the male plants close by were flowering in rich profusion. I went thither (a long tramp!) purposely to obtain flowering specimens of both sexes, and was much disappointed in not detecting those of the female plant.

Order XLII. ERICEÆ.

Genus 1. *Gaultheria*, Linn.

1. *G. multibracteolata*,⁶⁸⁶ sp. nov.

Plant (apparently) a stoutish shrub, my specimens of forked branches being 5 in.–6 in. long; bark pale, glabrous, shining. Leaves opposite, petiolate, ovate, 1 in.–1½ in. long, slightly cordate (those on lower stem broader and more cordate), pale-green, coriaceous, glabrous, tip subacute, thickened, margins crenate-serrate with sharp black teeth, veins much reticulate; petioles short, stoutish; young leaves membranaceous and bright-red, with a few long coarse flexuous reddish hairs scattered on veins below. Flowers in small few-branched compact terminal panicles 1½ in. long; branches [390]

686 *Gaultheria oppositifolia* Hook.f.

short, few-flowered, with many bracteoles between the flowers; the bracts at bases of branches of panicle large, broadly deltoid, pale, conspicuous, with coarse and close erect black bristle-teeth at margins; pedicels stout, curved, sub 2 lines long, with several (3 or more) small bracteoles within the large and pale bract at their bases. Calyx (sometimes 6-lobed), lobes deltoid, glabrous, subacute. Corolla pale-red, 2 lines long, lobes blunt, tips recurved, each lobe with 1 strong middle vein and 3 parallel veinlets on each side roundly united below base of anther and branched above. Stamens sublanceolate, slender, broadest near base, thickly muricated; anthers short gibbous, with each forked awn springing from a single narrow stem arising from tip of anther. Style slightly capitate, penicillate. Capsules small, dry, on long spreading pedicels.

Hab. Interior hilly country near Taupo; 1889: *Mr. H. Hill.*

Obs. This species has close affinity with *G. oppositifolia*, Hook., but its differential characters appear to me to be strong. Its leaves are much smaller, and of a different shape, more sharply serrate with hard black prickly points, hairy below, petiolate, and *not* stem-clasping—which is so prominent a feature in that species; its panicle of flowers is also smaller and much more compact, with different bracts bearing bristly margins, and a larger number of bracteoles; its flowers, too, are larger and coloured reddish; and its anthers have very differently-shaped awns.

Order L. BORAGINEÆ.

Genus 1. Myosotis, Linn.

1. *M. subverncosa*,⁶⁸⁷ sp. nov.

Plant perennial, ascending, 6 in.–18 in. high, strigosely hairy; hairs white, closely adpressed, very thick on upper part of raceme; lower stem woody, subprostrate, much branched above; branches compound, slender, flexuous, erect, each usually bearing long terminal virgate racemes. Stem-leaves thin, sub-linear-ovate, very obtuse, 1½ in. long, 3–5 lines wide, sessile, amplexicaul, midrib thick at base, margins coloured and ciliolate; hairs on upper surface stout, subulate, acute, the leaf at their bases of a different colour submucratured and shining as if varnished. Racemes axillary, slender, 4 in.–8 in. long. Flowers 12–24, distant 4–6 lines apart, alternate; pedicels sub-secund, 3 lines long, patent. Calyx large, 5-lobed; lobes cut nearly to middle, ovate, subacute, 1-nerved, 2 lines long in fruit, much expanding; hairy within; with shining dots at bases of hairs on outside as in leaves; the base of calyx dark-coloured. Corolla small, $\frac{1}{12}$ in. diameter, pale-blue [391] on the upper surface with a yellow eye, and pink on the outside; lobes spreading, elliptic-orbicular, tips retuse; tube nearly as long as limb; anthers included small; processes at mouth of tube very small and crenulate. Seeds 4, large, cordate-orbicular, flattish, shining, pale-brown (dark mature), margins thin produced dark-brown.

687 Possibly an introduced plant.

Hab. Sides of streamlets, low grassy plains, south of Dannevirke, County of Waipawa; 1891: W.C.

Obs. A species having affinity with some of our British species, but differing from them in several characters. It was late in the season when I detected this plant, and so failed to obtain radical leaves.

Order LIII. SCROPHULARINEÆ.

Genus 7. *Veronica*, Linn.

1. *V. macrocalyx*,⁶⁸⁸ sp. nov.

Plant herbaceous, densely gregarious, perennial (or biennial), glabrous, small, 3 in.—4 in. high, usually simple, erect, sometimes branched and ascending, and when so the slender decumbent branches are rooting below; stem and peduncles puberulent. Leaves scattered, lowermost broadly elliptic (or broadly oblong-ovate), $3\frac{1}{2}$ — $4\frac{1}{2}$ lines long, 3-nerved, margins slightly and sparsely crenate-notched, petioles short, slender; upper stem-leaves smaller and narrower, margins entire, subsessile. Flowers at top, axillary, single, alternate, rather distant; peduncle 2 lines long, erect. Calyx large, leaf-like, 4-cleft nearly to base, much larger than corolla, spreading; lobes oblong, obtuse, 1-nerved, margins entire. Corolla patent, 2 lines diameter, oblate-orbicular, white (bluish before expanding), the 3 larger lobes sub-orbicular-ovate with blue-purple longitudinal lines (the upper lobe having 6—8 and the lateral lobes 2 lines on each), the lower lobes much smaller oblong-spathulate, white; tube very short, the faux yellowish, hairy, hairs

688 Probably an introduced weed.

patent. Anthers large, cordate, exserted, blue; stamens stout, white; stigma capitate, penicillate. Capsule pale-fawn, large, compressed, obcordate-orbicular, 2 lines wide, deeply notched, glabrous, margins subacute glandular-hairy. Seeds numerous, broadly elliptic, compressed, pale.

Hab. Open grounds, in grassy spots, forming large patches, banks of River Manawatu, near Te Hautotara (Maori) village, four miles south of Dannevirke, County of Waipawa; late autumn, 1891: W.C.

2. *V. rugulosella*,⁶⁸⁹ sp. nov.

Plant small, herbaceous, annual, simple, erect, 6 in.–8 in. high, slender, sometimes rooting at lower leaf-nodes, stem and [392] peduncles pubescent; hairs numerous, short, close, sub-strigosely appressed. Leaves few, glabrous, distant, lower 4–5 pairs opposite, connate, 1 in. apart; broadly elliptic, $\frac{1}{2}$ in. long, tip rounded, 5-nerved, veinlets largely anastomosing, margins slightly crenate-toothed, petiolate, petioles short sub 1 line long; upper leaves alternate oblong, tips rounded, decreasing gradually in size to apex of stem. Flowers 12–30, axillary, one in each axil of upper leaves; peduncle erect, 2 lines long. Calyx-lobes cut nearly to base, elliptic, 3-nerved, erect, a little longer than capsule, glabrous (but when young sparsely and finely ciliolate), subrugulose. Corolla pale, small, $2\frac{1}{2}$ lines wide, lobes rounded, the uppermost 7-nerved nerves forked at top; lateral lobes 5-nerved, nerves simple. Stamens linear-lanceolate, widest near top, slightly exserted; anthers orbicular-cordate.

689 Probably an introduced weed.

Style length of capsule, erect; stigma capitate, penicillate. Capsule reniform, 2 lines broad, glabrous, shining, pale-brown, rather deeply notched, a few short erect glandular hairs ciliolate at margin; each cell subinflated. Seeds numerous, very minute, 38 in one cell, broadly-oblong, shortly stipitate, white.

Hab. Among grasses and other low herbage, open lands south of Dannevirke, County of Waipawa; 1889: W.C.

3. *V. areolata*,⁶⁹⁰ sp. nov.

Plant herbaceous, prostrate, weak, annual (?), simple, slender, 12 in.–15 in. long, sometimes branched from base. Leaves few, thin, hairy, hairs rather long and weak, shrivelled, white and jointed, petiolate, patent, distant, the lower ones 2 in. the upper 1 in. apart, alternate (the lowest pair opposite), sub-orbicular and broadly oblong, 5–7 lines long, tip obtuse, base truncate, 5-nerved (the upper ones only 3-nerved), much veined; veinlets anastomosing; margins cut crenate-serrate, largely ciliate, ciliæ stout, acute. Flowers axillary throughout from near base, single, peduncles erect, spreading, filiform, 1 in.–1½ in. long. Calyx large, spreading, ½ in. diameter, lobes 3 lines long, ovate-acuminate, 3-nerved, ciliate, cleft to base; veinlets anastomosing. Corolla membranous, 2 lines diameter, pale-bluish, lobes broadly rounded, much veined, margins entire. Anthers included, large suborbicular, peltate, blue, margined; stamens stout, broadly lanceolate; style rather long; stigma capitate, penicillate. Capsule large, reniform, 3 lines broad with a deep notch, hairy, margins ciliate, much veined; veins

690 Probably an introduced weed.

prominent, anastomosing. Seeds obovate, sub-cup-shaped, stipitate, regularly laterally ribbed on one side; pale, 6–8 in a cell.

Hab. Open land, edges of forest, south of Dannevirke, County of Waipawa; 1890: W.C. Only a few plants noticed. [393]

4. *V. hirsuta*,⁶⁹¹ sp. nov.

Plant annual, small, herbaceous, weak, pale-green, very hairy; rootlets numerous, exceedingly slender, long, hair-like; stem simple, erect, 2 in.–3 in. (rarely 4 in.–5 in.) high, sometimes branched from near base; branches ascending, slender, reddish-brown; hairs white, jointed, irregularly long and patent on stems, their bases broad and shining on leaves, Leaves petiolate, few, very thin, broadly ovate, 3–4 lines long, margins cut-serrate, tip subacute, base subtruncate, 5-nerved; petioles short.

Flowers 10–12, axillary in upper part of stem and branches, pretty close together; peduncles short about 1 line long, erect. Calyx 4-lobed; lobes irregular, 2 large and 2 small, broadly lanceolate, cut nearly to base, much ciliate, the 2 smaller ones length of capsule, the larger pair much longer. Corolla pale, small, $\frac{1}{10}$ in. long, 6-veined, tube very short; stamens short; anthers included, reniform, bluish. Style short, not reaching to outer margin of capsule; stigma small. Capsule obcordate, $\frac{1}{10}$ in. broad, deeply notched, glabrous, pale-fawn, ciliolate. Seeds very minute, sub-obovate-oblong, slightly convex, pale-yellowish, 9–10 in a cell.

691 Probably an introduced weed.

Hab. On open plains, among grasses and small herbage, south of Dannevirke, County of Waipawa; 1889: W.C.

Obs. I have diligently compared these four small species of *Veronica* with the similar British species of this genus (as described and drawn by Hooker, Sowerby, and Bentham); and, although in some few and minor particulars they correspond with those northern species, they differ largely in the more important and grave characters. I regret that I did not obtain any specimens of them in their early flowering state, though had I only done so I should have missed their ripe fruit.

Order LVIII. PLANTAGINEÆ.

Genus 1. *Plantago*, Linn.

1. *P. dasypylla*,⁶⁹² sp. nov.

Plant perennial, small, tufted, gregarious; rootstock thick, hairy; hairs dense, rather long, fine, pale-reddish-brown; rootlets very long, descending. Leaves suberect, 10–14, of various lengths, narrow-oblong-lanceolate, 1 in.–1 $\frac{3}{4}$ in. long, 3–4 lines wide, tip subacute, thickened, gradually tapering into petiole, thin, green (sometimes reddish), margins red, entire (sometimes with 2 small blunt sinuate teeth on each side), very hairy on both surfaces and at margins, but most so on the under-surface; hairs scattered, tortuous, thickish, articulated; petioles $\frac{3}{4}$ in.–1 $\frac{1}{4}$ in. long, slender, flattish, slightly hairy (hairs as those of leaves), bases much dilated and having long reddish-brown hairs. Scapes 1–4 (usually 3) to a

692 *Plantago raoulii* Decne.

plant, erect, much longer than leaves, 3 in.–5 in. long, very slender [394] almost filiform, densely hairy especially at top; hairs short, white, strigose pointing upwards. Spike small, broadly-oblong, 3–4 lines long, subcylindrical, 7–12-flowered; flowers sessile, close. Bracts broadly ovate, subapiculate, glabrous, purple (brown in age), with broad black thick keel. Calyx sepals similar but smaller, extending beyond circumcis of capsule. Corolla small, very membranous, narrow-triangular-ovate, white, erect, sometimes adpressed to capsule. Anthers slightly exserted, cordate-orbicular, strongly apiculate, red-brown. Style largely exserted, flexuous, shaggy. Capsule large ovoid, shining, beak stout. Seeds 5, oblong, obtuse, white, shining, minutely and closely pitted.

Hab. Among grasses and other small herbage on banks of a small stream, open plain, Tahoraiti, south of Dannevirke, County of Waipawa, where it forms pretty large patches; 1890–91: W.C.

Obs. A species having near affinity with *P. picta*, mihi (Trans. N.Z. Inst., vol. xxii., p. 481), but differing in several characters.

1891 Description of Three Species of Newly-discovered New Zealand Ferns. *Transactions of the New Zealand Institute*; 24: 394-398.

[Read before the Hawke's Bay Philosophical Institute, 12th October, 1891.]

Hemitelia, Br.

1. *H. (Amphicosmia) falciloba*,⁶⁹³ sp. nov.

Caudex erect, stoutish, woody, 6 ft. high. Fronds spreading, bipinnate, submembranous, brownish-green above, pale (sometimes nearly white) below with minute shining specks widely dispersed, glabrous, with a few scattered weak hairs on costa and veins, and mostly on upper surface; basal scales, subulate, 2 in. long, $\frac{1}{12}$ in. wide at base with a small circular hole, very acuminate, tips filiform acute, margins plain, dark-brown finely and much striate, crinkled, very glossy. Rhachis unarmed, rather narrow, deeply sulcate on upper side, filiform at tip (and also subrhachises), densely clothed with weak reddish woolly down, intermixed with scattered long flat narrow crumpled red scales, $\frac{1}{2}$ in.- $\frac{3}{4}$ in. long, nearly 1 line wide at base (some narrow throughout), very acuminate, tips setigerous black, centre thickish dark-brown, sides semi-pellucid, margins distantly and roughly setigerous-serrate, teeth black. Pinnæ remote 3 in. (or more) apart, subopposite (alternate towards apex), subpetiolate, 15 in. long, 6 in. broad, oblong, [395] tip acuminate; rhachis slender, flattish, reddish, deeply

693 *Cyathea dealbata* (G.Forst.) Sw.

sulcated above; pinnules extending close to rhachis, 2–3 at base a little shortened. Pinnules 3 in. long, $\frac{3}{4}$ in. broad, linear, tips very acuminate acute, shortly stipitate, pinnatifid, cut almost to costa, subpectinate, rather distant $\frac{1}{2}$ in. apart, free, alternate, spreading, horizontal; lobes alternate, remote, free falcate, semisubulate, tips acuminate, acute, margins recurved, plain, slightly serrulate towards apex. Veins pinnate, distant, very clear; veinlets forked and triple, when triple the lower one is invariably single, the upper forked. Sori small globular, regular near costa on forks of veinlets, usually 2 on a lobe one on each side of vein, and 4–5 (rarely 6) on lowest basal lobes. Involucre a very small concave greyish scale on the posterior side, margin entire; veins much coarsely reticulated, black (under lens).

Hab. On the side of a precipitous gully overhanging a small streamlet, in a forest south of Dannevirke, County of Waipawa; January, 1889: W.C.

Obs. This species is very distinct from those New Zealand species already described,⁶⁹⁴ apparent at first sight. Unfortunately I have not obtained complete specimens, or, rather, what I have are partial and young, though perfect in themselves. This fern has a little history: I was returning one evening rather late and tired from my usual botanizing excursion during a hot day at midsummer, when on nearing the edge of a deep gully I noticed two tree-ferns overhanging it. From their appearance I thought them different from others, and I

694 WC: *H. smithii*, Hook. (described as *Cyathea smithii*, Flora N. Zealand), and *H. (Amphicosmia) stellulata*, Col., Trans. N.Z. Inst., vol. xviii., p. 222.

exerted myself to secure portions of their fronds for examination. Being higher than myself, with fallen trees and broken branches around, I could scarcely get at them; moreover, on the side towards me their fronds had been broken off short, as if by a falling tree; so I only brought away tips of fronds (8 in.–10 in.), and perfect full-size barren pinnæ from about the middle of a frond, and young pinnæ from newly-developed immature fronds bearing fruit; and when I next visited that spot (purposely, I may say) I found it had been ravaged by fire (a too common thing in those woods), and those two tree-ferns were consumed. I have since assiduously sought another specimen in my frequent visits to those forests, but without success.

Genus 5. *Hymenophyllum*, Smith.

1. *H. polychilum*,⁶⁹⁵ sp. nov.

Plant terrestrial; rhizome subterranean, shortly creeping, naked, its rootlets very hairy; hairs dark-red, patent, often [396] terminating in a minute round glandular-like ball. Frond membranous, 8 in.–11 in. high (stipe included), 3½ in.–4 in. broad at base, deltoid-acuminate, 3-pinnatifid, leafy, dark-green, suberect, slightly decurved; stipe (4 in.–5 in.) terete, glabrous, shining, rigid, more or less flexuous, dark-brown. Rhachis and subrhachises winged throughout, pinnæ close overlapping, their tips often elongated, simple and forked at apices, the lower ones decurved; sometimes the second pair from base are the longest, the lowest pair opposite with their large basal segments meeting over rhachis, presenting a semi-crisp

695 *Hymenophyllum demissum* (G. Forst.) Sw.

appearance; segments broad, laciniate; lobes narrow-linear, entire, obtuse. Involucres on all pinnæ, but mostly very numerous on upper two-thirds of frond, marginal on all sides and tips of segments and lobes, very large, wider than lobe, oblate, hemispherical and oblong, 2–4-fid to base, open, spreading, sometimes 2–3 together; lips entire, truncate, broad, sometimes once-notched; here and there two clusters of sori are together within one involucre. Sori prominent, much exposed; capsules large, striking, each with a bright-red shining elastic ring.

Hab. Dry shaded woods south of Dannevirke, County of Waipawa; 1890–91: W.C.

Obs. This is another handsome fern; it forms small loose tufts or mats, on the ground among the trees. It is allied to *H. demissum*, from which species, however (and from all others known to me), it differs—in its large and peculiar involucres, also in its rhachis and subrhachises being winged throughout, in its darker-green colour, close and overlapping pinnæ and segments, and in not creeping diffusely nor climbing trees like that species. It is also closely allied to *H. erecto-alatum*, Col. (Trans. N.Z. Inst., vol. xi., p. 431), but that species is much smaller, and of a light-green colour, with the wings of its rhachis and subrhachises largely and vertically crisped, its stipe is also winged above, and its involucre though large is very different.

Genus 22. *Polypodium*, Linn.

1. *P. amplum*,⁶⁹⁶ sp. nov.

696 *Hypolepis ambigua* (A. Rich.) Brownsey & Chinnock.

Plant terrestrial, forming large close beds or patches many yards in extent; stipites single, distant, suberect, fronds drooping. Rhizome creeping, slender, subterraneous, somewhat brittle (as also stipites). Stipe 2 ft. 8 in. long (some shorter), as thick as a common-size lead pencil, obscurely triquetrous the back broadly rounded and the sides flattened, glabrous, shining, pale-brown, with minute sparsely-scattered, darker-coloured points scarcely submuricate, deeply sulcated on upper side throughout the whole length, the lower part semi-scaberulous to the touch, the extreme base (also elongating [397] tips or shoots of rhizome) densely clothed with very short shining reddish-brown terete jointed appressed hairs, their tips obtuse. Frond ample, subdeltoid, 3 ft. 6 in. long (some smaller), 3 ft. 2 in.–3 ft. 6 in. broad at base, tripinnate (or subquadripinnate), green, very membranous, glabrous, with small weak shrivelled whitish strangulated scaly hairs scattered singly on veins and veinlets both surfaces; pinnæ large, distant, loose, horizontal; rhachis and subrhachises pale, stramineous, smooth and glossy on the under-side, with minute greyish scaly hairs on the upper. Pinnæ, primaries distant on main rhachis, lowest pair 6 in. from the next, which is 5 in. from the next above, sub-ovate- (or deltoid-) acuminate, 20 in.–21 in. long, 10 in.–11 in. wide at base, the lowest pair always opposite (and the next two pairs nearly so), their petioles 1 in. long; secondaries petiolate, alternate (the lowermost pair subopposite), free, 2 in. apart, 5 in.–6 in. long, 2 in. wide, sub-ovate-acuminate, tips caudate acute their lobes very small confluent; rhachis remarkably slender, almost filiform. Pinnules alternate (the three lower pairs opposite), free,

distant, spreading, $1\frac{1}{4}$ in. long, 4 lines wide, narrow oblong broadest at base, flat, deeply pinnatifid, subsessile (or much contracted subpetiolate), narrowly decurrent, the superior base also runs up (*sursum currens*), so that both sides join on to the next pinnule, tips rounded and bluntly 4–6-toothed, midrib undulate. Lobes opposite, usually six pairs (decreasing in number towards tips), distant, broadly oblong, sub-falcate, narrowly margined, margins pale and shining, entire (sometimes a single large crenate tooth on anterior margin), irregularly undulate, sinuses rounded, tips rounded very obtuse, 2–3-toothed, teeth obtuse. Veins pinnate, 3-jugate; costa forked at apex; veinlets simple and forked, free, distant, extending to margin. Sori round, distant, regularly disposed opposite in pairs, one on a lobe on the lowest inner veinlet, and 2 opposite on the basal lobes, about 4–5 pairs on a large pinnule (confined to the lower lobes), submarginal and near to sinus, pale- and light-brown.

Hab. Edge of wood, south of Dannevirke, County of Wai-pawa; May, 1891: W.C.

Obs. I. This fern, which I call a remarkable one, has both pleased and puzzled me. Fortunately I found it growing in abundance, forming large tangled brakes, much like *Pteris esculenta* in growth and habit, and like that also in it being difficult to get through—in which respect it is almost worse than the *Pteris*, from it being so brittle and entangled, the long tender fronds breaking and impeding. From the extreme tenderness of its fronds it is also difficult to obtain a perfect specimen, even in a young state the tips of its long flaccid pinnae being generally broken and imperfect. [398]

II. I again visited its place of growth in September, and was surprised to find not a single frond living. All had died quite down to their roots, and were prostrated and soft; but fine stout green leafy young fronds 8 in.–10 in. high were everywhere vigorously shooting.

III. It is pretty nearly related (*prima facie*) to *P. punctatum*, Thunb. (*P. rugulosum*, and *P. rugosulum*, of authors), but differs from that fern in many characters, and particularly from the drawings of it, with dissections and descriptions, as given in Labill., Flora Nov. Holl., and in Beddome's Ferns of S. India. Our N.Z. *P. punctatum* is a much smaller plant, its pinnæ and pinnules close and compact, with differently-shaped pinnules and lobes, that are thicker and very viscid (adhering to drying-papers), with its numerous crowded sori situate on middle of veinlet, and has dark-red rough muricated stipes and rhachises with numerous coarse red and patent hairs. A good and peculiar differential character is to be found in this fern (*P. amplum*), in its broad and flat pinnules, which are semi- (or constricted-) adnate, with their extreme bases narrowly extending both upwards and downwards on their subrhachises (requiring, however, when dried, a good lens to detect), and also in the very acuminate and narrow tips to its pinnæ.

1891 A List of New Species of Hepaticæ novæ-zelandiæ, named by F. Stephani, Leipzig.

Transactions of the New Zealand Institute 24: 398-400.

[*Read before the Hawke's Bay Philosophical Institute, 12th October, 1891.*]

LAST year (1890) I completed the somewhat arduous task I had imposed on myself—viz., the putting-up for Kew the numerous specimens of the smaller Cryptogams (*Hepaticæ* and *Fungi*) I had discovered during the last few years in our inland forests. They arrived safely at Kew, and the Director, Mr. Thiselton-Dyer, sent the *Hepaticæ* to Leipzig, to the celebrated cryptogamist, Mr. F. Stephani, for examination and determination. And in February last I received from Mr. Thiselton-Dyer the following list of *species novæ* that had been determined and named⁶⁹⁷ by Mr. Stephani, and of others already known to science, but now detected here:— [399]

I. SPECIES NOVÆ, NOW NAMED BY MR. STEPHANI.

- Symphyogyna monoica.
- Chiloscyphus exectifolius.
- C. trilobatus.
- Lophocolea filicicola.
- L. triangulifolia.
- Radula grandis.
- R. papulosa.

697 WC: Many of these Fungi were determined and named last year by Dr. Cooke, and are already published in *Trans. N.Z. Inst.*, vol. xxiii., p. 391.

Lejeunea colensoi (*Lopholejeunea*).

L. glauca (*Pycnolejeunea*).

L. colensoi (*Harpalejeunea*).

Aneura colensoi.

A. striolata.

A. oppositiflora.

A. æquitexta.

A. dentata.

Tylimanthus (*Gymnanthe*) *spinosus*.

Anthoceros pallens.

A. laminiferus.

II. SPECIES ALREADY KNOWN TO SCIENCE, BUT NOT HITHERTO INCLUDED IN THE FLORA OF NEW ZEALAND.

Plagiochila fenzlii, *Reichardt*.

P. banksiana, *G.*, *MS.*

P. hookeriana, *Ldbg*.

Lepidozia centipes, *Tayl.*

L. ulothrix, *Ldbg*.

Mastigobryum mittenii, *Steph.*

Radula mittenii, *Steph.*

Monoclea forsteri, *Hook.*

Lejeunea serpyllifolia, (?) *Lib.* (*Eulejeunea*).

L. sinclairii, *Spruce* (*Eulejeunea*).

Metzgeria nitida, *Mitt.*

M. australis, *Steph.*

Acrobolbus concinnus, *Mitt.*

Polyotus menziesii, *G.*

Marchantia cephaloscypha, *Steph.*

Cephaloziella exiliflora, *Tayl.*

III. SPECIES NOT BEFORE DETECTED IN NEW ZEALAND.

There were also some others which had not before been detected in New Zealand, though described in the Handbook Flora of N.Z., from being found in the Auckland and Campbell Islands: these I do not here repeat.

And, as Mr. Stephani has also kindly examined and determined several *species novæ* named and described by me in some of the late volumes of the Transactions N.Z. Inst. [400] (specimens of them being among those sent to him, and included in his list), I also give them here— viz.,—

- Gottschea guttata.
- G. marginata.
- G. heterodonta.
- G. squarrosa.
- G. ramulosa.
- Plagiochila subfasciculata.
- Lepidozia concinna.
- Symphyogyna connivens.
- S. brevicaulis.
- S. flavovirens.
- Mastigobryum nitens.
- M. elegans.
- Chiloscyphus vulcanicus.
- C. lingulatus.
- C. ammophilus.
- Madotheca amæna.
- Aneura marginata.
- A. polymorpha.
- A. perpusilla.
- Isotachis montana.

Anthoceros pellucidus.

There were also very many others, specimens of *Hepatica* already known to science, and described by Sir J.D. Hooker in his "Flora Novæ-Zealandiæ" and "Handbook of New Zealand Flora," most of them (and, indeed, all in the list) being often repeated and numerous, having been collected in several years and at different seasons, and from various habitats: besides others (probably *species novæ*) that were sterile or imperfect. The number of separate packets of *Hepaticæ* received by Mr. Stephani amounted to 1,027.

**1891 Plain and practical thoughts and notes on
New Zealand botany. *Transactions of the New
Zealand Institute* 24: 400-409.**

[*Read before the Hawke's Bay Philosophical Institute,
15th June, '1891.*]

CLASS III. CRYPTOGAMIA.

Order VI. HEPATICÆ.

ON this occasion, having been unexpectedly called on by our Honorary Secretary (on my recent return from sojourning in [401] the bush district) to furnish a paper for this evening's meeting, I come before you very much in the character of an "emergency man." And, in thinking over what I should bring before you, I have determined to say something concerning what I have frequently seen

with delight while away among our dense forests in the interior.

Of course you know of the two great living kingdoms of nature—namely, (1) the animal and (2) the vegetable.

This latter, the vegetable or botanical kingdom, is very properly divided into two great groups—the phænogamous or flowering, and the cryptogamous or non-flowering. (And here I will say, for the benefit of the younger portion of my audience, that I will endeavour to explain all hard scientific and technical words and names as I go on.)

The phænogamous or flowering group contains two great natural classes—the monocotyledons and the dicotyledons. To the monocotyledon (or one-seed-blade) class belong all plants of the grass, corn, lily, palm, onion, and very many others, including the large orchideous order; these all take their one distinctive name from the *single* cotyledon or shoot (sprout or tiny blade) which emerges from the seed or grain in germinating: while to the dicotyledon class belong all plants whose seed possess two cotyledons, leaves, or seed-lobules, as are so clearly shown in germinating in the pea, bean, radish, mustard, clover, &c.

The cryptogamous or non-flowering class is so called from not possessing perfect flowers, as are found in the flowering group; or, at all events, from their not being so apparent. In this great third class there are nine orders, which I shall briefly mention, and in so doing give you familiar instances of them all.

1. FERNS—for which, as you know, our colony bears a great botanical name from the rarity and beauty of many of them; and not only so, but some of them were to the ancient Maoris verily “the staff of life” (as bread-corn has been called with us)—the common fern, the *aruhe* of the Maoris, *Pteris esculenta* = edible *Pteris*, as it was rightly named by Forster, the able botanist who accompanied Captain Cook on his second voyage to New Zealand and the South Seas, and who often witnessed the general use made by the Maoris of its roots. This fern was of very great value as an article of food to the old Maoris, and was dug up and harvested and stored by them with much care for future use. And here I should inform you that, although this species of fern is so very common throughout all New Zealand, yet the best and prized edible root was not so common, and only found scattered in suitable soils and places: hence the common error respecting it by the settlers, who, in ploughing up the ordinary [402] fern-lands, marvel at any human being deriving nourishment from the fern-roots. Wishing to show good specimens of it at one of our Institute meetings some years ago, I got some through our resident Maori chiefs, obtained from inland beyond Te Wairoa, seventy miles distant. And I recollect being shown a small isolated volcanic hill, far away in the interior in the Taupo district (when I was travelling in those parts nearly fifty years ago), that was famed for producing first quality fern-root; and for the possession of that hill battles had been fought and much blood shed. The officers of Cook’s expedition ate of it when prepared by the Maoris, and praised it, remarking that it resembled London gingerbread. Then, there were also other ferns

used as food by the ancient Maoris, particularly the inner stem, or large succulent semigelatinous pith, of the large "black fern-tree," the *mamaku* of the Maoris =*Cyathea medullaris* = marrow-stalked *Cyathea* (also justly so named by Forster, who, in his writings, compared the soft edible pith, of which he had eaten, to sago). But I must pass on from the useful and pleasing fern order.

2. LYCOPODIUMS—of which order we have several species, though of little known use. Perhaps *L. volubile* (or twining *Lycopodium*) is among the prettiest. This plant was formerly used by the young New Zealand females to make neat and simple wreaths for their heads; and certainly, from its graceful slender form and light-green colour, it was well adapted for their raven locks. One other species, *L. densum*, I may also briefly mention, from its being considered very nearly allied to the large fossil *Lepidodendron* of our British coalshales.

3. MARSILIACEAE—Of this small and curious order we have only one species in New Zealand, *Azolla rubra*, a peculiar-looking water-plant, which may be commonly seen in large quantities, red, and floating on the lakes and pools near Te Aute and in the bush district, and in other small still waters. It was on the small fruits or capsules of nardoo (*Marsilea gigantea*), an allied plant of low humble growth, that the explorer Burke and his party, when they were in great distress from want of food, subsisted for some time in the interior of Australia, where it grows abundantly on the extensive plains of that country.

4. MOSSES.—Of these elegant productions of nature New Zealand has a good share, some of them being really superb, and prominent among the largest and handsomest of the order.

5. HEPATICÆ—This order is also well represented here; but, as I intend to make it the main subject of this paper, I pass on. [403]

6. CHARACEÆ.—A small order of peculiar water-plants containing only two or three genera, of which we have two, *Nitella* and *Chara*, and, somewhat curiously, seeing their species are few, three species of each.

7. LICHENS.—Of these strange aberrant vegetable productions we have several genera, and very many species of almost all conceivable shapes and sizes, many of them being also very rich in striking and bright colours, especially while living and after rains. It is really a grand, a superb sight to see an old tree, living or dead, in the still forests, closely covered with lichens—literally bedizened—and looking magnificent in its diversified multiform and many-coloured living decorations.

8. FUNGI, or the great Mushroom Order—whose manifold shapes and forms are still more strange and bizarre than those of the preceding order of lichens; and, while some are very small, among the minutest of all vegetable productions, others are exceedingly large and heavy, even as much as, or more than, a man can well lift. Many of them (like the common mushroom) are of quick sudden growth, soft, and short-lived; while others are of very slow growth, exceedingly hard and tough, and

of long continuance. A few of our New Zealand Fungi were articles of food with the ancient Maoris; but the principal edible one, *Hirneola polytricha* (commonly known by the appellative of the order, "fungus"), has long been a commercial article of considerable export, so much as 339 tons, valued officially at £15,581, having been collected in the forests in one year for the Chinese market, for the purpose of making into soups. When dried (and it is only purchased in that state) it is exceedingly light tough and horny, and will keep well for many years.

9. ALGAE, or marine and fresh-water weeds—of which our seas and rivers have their full share. A few of the shore seaweeds were also used as articles of food by the ancient Maoris residing near the sea—not, however, commonly, but as dainties; and not only so, but, when dried, sent as presents to friendly tribes residing in the interior, who made the return in fat forest-birds—pigeons and parson-birds—potted in their own oil.

Of those nine courts or natural divisions in the grand temple of cryptogamic vegetable nature, I choose No. 5, *Hepaticæ*, for my subject tonight; and the main cause of my so doing is my having lately received a letter from the Director of the Royal Botanic Gardens at Kew, containing a very long list of *Hepaticæ* from the celebrated cryptogamic expert, F. Stephani, of Leipzig, lately determined by him, numbering 1,027 specimens (or, rather, separate packets), being portion of a very large lot I had collected in our forests during several years and sent to Kew last year. This list I now [404] lay before you; and the *species novæ* contained in the

same,⁶⁹⁸ now named by him, will form the subject of a future paper. Moreover, as an adjunct or minor cause is the fact of my recent return from those dear old sequestered haunts in the dense and lonely forests where I had again been admiring those lovely productions of nature.

In 1864, Sir J.D. Hooker, in his "Handbook of the Flora of New Zealand," writing on this order, says, "Of the *Hepaticæ* (about 212) here enumerated, the greater majority were discovered by Mr. Colenso and myself, and were new to science on the return of the Antarctic Expedition to England" (loc. cit., p. 498). Since then, owing to many subsequent discoveries, I suppose the present number known of our New Zealand *Hepaticæ* to amount to about five hundred. Many of them are endemic; some are also found in Tasmania and in Australia, in the far-off antarctic islets, and at Cape Horn and Fuegia; while others are strictly identical with species denizens of the British mountains and of the South American Andes. Here, then, there is food for thought—whether such productions, now found so very far apart in the two hemispheres of the globe, were originally specially created, or whether developed; and, if the former, whether together at one time at both ends of the globe, or, if singly, which first.

And here I may mention a letter I have lately received from a skilful naturalist in the South Island. I had sent him some living molluscs (univalve land-shells) I had lately detected on a living tree in the forest, which

698 WC: See above, Art. XXXVII., p. 398.

seemed to me peculiar. In his reply he mentioned having lately found a species of land mollusc which is identical with a species hitherto only found in Java, and which he considered as proof of these two countries, that and this, now so far apart, having been at some distant period geologically connected. I cannot, however, agree with him in his conclusion; and I merely mention this as bearing in a slight degree on the finding of the same species of *Hepaticæ* occupying the extremes of both the Northern and Southern Hemispheres.

Numerous as our endemic species are, some of them are both very rare and local, while others are very common and plentiful. Some are generally epiphytical—that is, growing on other species, and on mosses and on some of the smaller ferns, particularly on *Trichomanes elongata* and *Hymenophyllum demissum*, one species in particular not unfrequently completely and closely covering the upper surface of the frond in the former plant with its pale delicate fringes, which are the more conspicuous from the very contrary colour of that dark-green fern; the branches of many living trees, even the topmost of [405] the tallest, including branchlets that are dead, are often clothed with them; the steep sides of streams and mouths of caves abound in species; and even isolated stones and boulders, and dry hardened logs denuded of their bark and exposed to the hot rays of the burning meridian sun, possess them, exhibiting most astonishing proofs of their endurance and long vitality; even dry black and charred logs, extra heated in the sun, are often thickly clothed with a small red species, bearing fruit too, presenting an uncommon appearance after rains. Many of them are very beautiful, being most exquisitely and symmetrically

formed and adorned; each species, however minute, possessing the greatest regularity in shape and size of leaves, in their delicate fringes and their mathematically-formed cells, &c., and this in its most delicate and microscopical distinctions.

I am not aware of any of them being of service or use to man, only that a few of the larger species of the genera *Lophocolea* and *Chiloscyphus* that are odoriferous were formerly prized and eagerly sought after in the woods by the ancient Maori females to impart a fragrant scent to their anointing-oils, as well as to wear in little sachels around their necks.⁶⁹⁹ To such an extent was this perfume valued that it was also both used as a proverb and sung in a loving nursery song.

Oh! there are curious things of which men know
 As yet but little—secrets lying hid
 Within all natural objects.
 He who findeth out
 Those secret things hath a fair right to gladness;
 For he hath well performed, and doth awake
 Another note of praise on Nature's harp
 To hymn her great Creator.

Some of our principal genera I will briefly mention, as I purpose showing you mounted specimens of some of their species, and plates of others faithfully drawn and coloured, with their dissections highly magnified, in

699 WC: These were also worn by the men (chiefs). Parkinson says, “The principals among them had their hair tied up on the crown of their heads and some feathers, with a little bundle of perfume hung about their necks” (Journal of Voyage, p. 93).

illustration. I trust that, at least, the ladies of my audience will not be discouraged on hearing their proper generic names, supposing them to be sadly uncouth and unmeaning, and totally unfitted for such delicate and elegant forms; for such is really not the case, as I hope to be able to prove to them.

Generic names of plants are usually chosen with two objects—1, to indicate and perpetuate the proper name of the botanical discoverer, or of some distinguished patron or friend of the science; 2, to show some striking specialty of the plant itself, the type of the genus—for this purpose a suitable Greek [406] name Latinised (simple or compound) is used. Thus, among those of our New Zealand *Hepaticæ* we have—of the former class, (1) *Jungermannia*, in honour of L. Jungermann, a botanical author; this genus is a very large one—formerly (and until the last forty-five years) nearly all our present genera were included in this one: (2) *Frullania* (another large genus), named after Signor L. Frullani, an eminent Italian statesman and great patron of botany: (3) *Lejeunia* (a very large and cosmopolitan genus, stated by Hooker in 1864 to contain 236 species, which have been largely increased since), named in honour of Dr. A.L.S. Lejeune, a botanical author: (4) *Gottschea*, “a noble genus, almost confined to the Southern Hemisphere, and abundant in New Zealand” (Hook., l.c., p. 512), named after the celebrated cryptogamic botanist and author Dr. C.M. Gottsche: and of the latter class—(1) *Trichocolea* = hairy sac or bag (such being the state of its calyx); (2) *Polyotus* = many ears (from the very peculiar appearance of its neat little concave and lobulated leaves); (3) *Isotachis* = equal-rowed spike or ear—as of wheat, &c. (the leaves of

this elegant species forming two close and very regular rows, while a third and similar row is formed of its large stipules); (4) *Plagiochila* = oblique lip, or mouth—of its calyx; (5) *Madotheca* = bald, smooth, largely-rounded capsule, issuing from its calyx bag or case; (6) *Mastigobryum* = whiplash-like moss (from its very long and slender scaly aerial rootlets, resembling the scaly stem of a minute *Lycopodium*, a peculiar and striking feature); (7) *Lepidozia* = scaly bud (gemma), from its general appearance; (8) *Chiloscyphus* = cup-shaped lips, from the form of its calyx; (9) *Psiloclada* = slenderly branched, sparingly leaved; (10) *Zoopsis* = rigid, silvery, scaly, animal-like; (11) *Aneura* = without nerve.

Now, these and suchlike generic names (and there are many such among our New Zealand plants) convey a true and useful *prima facie* meaning to those who know the Greek and Latin languages, and such natural names aid in properly placing newly-discovered species under their respective genera. And, strange as it may seem to English ears, such names are far more scientific and serviceable than many of those common and plain ones of our English plants, as alder, ash, apple, cherry, oak, larch, plum, &c.

Here, I think, I may properly relate a striking observation of Bishop Selwyn's on this very subject of (the so-called) "hard botanical names." The Bishop had been looking over my manuscript scientific catalogue of New Zealand plants (which I had collected from various sources for my own use, there being then no published work on New Zealand botany) for their names for his "Church Almanac," and, he having casually remarked on "the

reproach of the science" (its often [407] hard and uncouth names), and coming to *Urtica ferox* = fierce stinging-nettle; *Phormium tenax* = tenacious basket-weaving plant; *Pteris esculenta* = edible fern; *Arundo conspicua* = conspicuous prominent reed (and suchlike), the Bishop said, "Now, this is what I like. In these names is contained intelligent and useful information, even to a stranger or novice in botany."

The fascinating wonders of Nature are indeed greatly displayed here in this order to the inquiring mind and eye. Here is to be seen the perfection of elegance and beauty in her humblest productions. Permit me to more particularly call your attention to the specialities of some of our genera of this order—e.g., in form, so intricately and finely compound, almost bewildering, yet regular—*Trichocolea*; and, on the other hand, so very simple—*Symphyogyna*: in size, *Plagiochila*, some of which are large dendroid and tree-like, branched and nearly 1 ft. high, resembling small shrubs; while others of this same genus are very minute: in extreme fineness and delicacy of structure—*Zoopsis* and *Psiloclada* in remarkable close regularity, shape and position of their imbricated leaves—*Isotachis*, *Madotheca*, *Mastigobryum*: in their charming rich and varied colours (on the one plant), golden, orange, purple, emerald-green, &c.—*Polyotus*: in elegance and richness of superb cutting and fringing—*Gottschea*, *Chiloscyphus*: and, generally, in their minute cells, their structure, shape, regularity, and mathematical correctness; in their endurance, retaining life though daily heated and scorched, crisped and dried up by the summer's sun; in the excessive minuteness and regular form of their microscopical spores (seeds), &c.; in the

highly curious manner of the distribution of their seeds when ripe, which is done by coiled and double-spiral elaters, or springs.

Not unfrequently, when alone in the low, secluded, damp dells and gullies of the umbrageous forests, far away from man, surrounded by these beautiful *gems*, and contemplating them in their luxuriant perennial growth, their pleasing elegant profusion, and almost endless variety of forms, have I been led to exclaim,—

Who can this field of miracles survey,
And not, with Galen, filled with rapture, say,
“Behold a God! adore Him, and obey”!

And here I may briefly remark in passing (and so, possibly, anticipate a question) that it is all one to me, at such times, whether those many and varied, yet regular and symmetrical, forms were produced by creation or by evolution. Rather, however, would I set the consideration of that deep and difficult question aside that I might the more fully drink in and enjoy the exquisite living scene before me. [408]

I will now lay before you a few dried and mounted specimens illustrating some of the principal genera I have mentioned; but in so doing I must premise that, just as the planets and distant large objects are the more clearly revealed by the aid of the telescope, so also these minute ones are by the aid of the microscope. Indeed, without it their beauties and wonderful formation and structure are wholly unknown, being invisible to the unassisted eye.

Here, also, in several large botanical volumes on the table are faithful coloured and magnified drawings of many

species, with their microscopical dissections. These well-executed plates will best show these lowly yet lovely plants, and will no doubt interest you more than the dried specimens.

In some of the later volumes of the Transactions of the New Zealand Institute I have described several new species of *Hepaticæ*. Both in detecting and in collecting, and also in working at them under the microscope, I have enjoyed many a pleasant hour; such sometimes even serving to powerfully neutralise chronic rheumatic pains.

I am happy in knowing that the study of this order of plants has become increasingly popular of late years—that is, abroad, all over the world; for I regret to say such is not yet followed here in New Zealand. I have received several letters from cryptogamic botanists in both Europe and America, who were desirous of studying our New Zealand *Hepaticæ*; but I am unwillingly obliged to decline, at my advanced age, the taking-up with any new scientific correspondents, involving the collecting and transmitting of specimens, though a few years ago I should have rejoiced in doing so. It grieves me not a little when I reflect on the utter carelessness of our colonists generally (both old and young) toward all scientific pursuits. Superior education, though so largely praised and attended to by our rising generation, seems to have effected very little in this respect. The study of botany, especially of the cryptogamic class, and more particularly of this order *Hepaticæ*, is a highly-pleasing one. It is of a calming nature, beneficial and mentally profitable to the student, leading him genially on “through Nature up to Nature’s God.”

In conclusion, I must ask forgiveness of my audience for the roughness and disjointedness of my paper, as but little time was allowed me for its preparation; hence its hurried and somewhat irregular form.

The principal books referred to as containing faithful and valuable plates of *Hepaticæ*, also shown on this occasion, were—

1. "Botany of the Antarctic Voyage," Hooker fil., vols. i., ii., iv., vi., with coloured plates. [409]
2. "Species Hepaticarum," Lindbg. et Gottsche, coloured plates.
3. "Hepaticæ Amazonicæ et Andinæ," Spruce.
4. "British Jungermanniæ," Hooker, coloured plates.
5. "Musci Exotici," Hooker, vols. i. and ii.

And several small but more recent works, containing well-executed plates of various species.

**1891 Vestiges; reminiscences; memorabilia, of
Works, Deeds and Sayings of the ancient
Maori.**

Transactions of the New Zealand Institute 24: 445-467.

[*Read before the Hawke's Bay Philosophical Institute,
12th October, 1891.*]

“Ex ungue leonem.”⁷⁰⁰

—Prov.

WHEN relating any peculiar and striking doings of the Maoris of the olden time, which I had either seen or heard of in my early days among them (now nearly sixty years ago), I have not infrequently been asked to commit the same to writing, or, in other words, “to make a book.” This latter, however, I am not inclined to do, partly from want of time for such a purpose. Notwithstanding, I have thought I would jot down briefly a few of their more remarkable and little-known ancient acts and deeds, as many of them have long become obsolete, and are scarcely known even by name to the present generation of Maoris; and very likely there is not another European now living besides myself who knows anything about their old doings from actual observation; having frequently [446] visited Maori villages in all parts of the North Island, where no European had preceded me.

700 You may tell the lion by its claws.

§ I. OF THE MAKO SHARK.

Fifty years ago (to go no further back) a Maori chief would be known by wearing certain emblems or insignia indicative of rank, one of which was the tooth of the *mako* as an ear-pendant; and, as such were plentiful, though distributed, the thought often occurred to me in my early travelling days, What a number of the fish *mako* there must have been captured or obtained by the Maoris to yield such a large number of teeth! Moreover, on inquiry I invariably found that all the teeth I saw were prized heirlooms, and had descended to the present possessor through several generations, and (as far as I could learn) none had been recently acquired. And while, when travelling along the sea-coasts for many a league on both sides of the North Island during several years, and always on foot, I had both seen and heard of a number of large sea-animals (fishes and mammals) that were driven on shore on the sandy beaches in severe gales from the sea, I never knew of a single *mako* shark, nor had the Maoris resident on those shores ever heard of one being cast up.

In replying to my numerous inquiries by letter respecting the *mako*, made many years ago, an intelligent aged Maori chief living on the east coast wrote as follows (or, rather, he being of the old school, and unable himself to write, a young adherent did so at his dictation). I give a literal translation of portions of his letter:—

“You ask, did I ever see a *mako* fish? Yes; and it is a very large creature, the biggest of all the sharks (*mango*)—in length 2 fathoms measured (*erua maro whanganga nei*), and in thickness 1 ft. It is a true shark, but called by us a

mako on account of its teeth. You also inquire concerning its fat or oil, and the edible qualities of its flesh, whether considered choice by us Maoris. Now, there are many kinds of shark, as the *mako*, the *karaerae*, the *pioke*, the *ururoa*, the *uatini*, the *tahapounamu*, the *taiari*, the *tatere*, and the *mangotara*, and I have not eaten of them all, and therefore I do not know how nice or how fat they all are; and so of this one, the *mako*. But, my friend, this fish was never desired as an article of food—never so used by us Maoris. The only part of it that we sought and greatly desired to have was its head, and this solely on account of its teeth. When caught out at the deep-sea fishing-grounds its body was never hauled into the canoe, but the head was cut off while it was still in the sea and alongside of the canoe (*ka tapahia moanatia te upoko*): this done, and the head secured, the body was left to drift away on the sea. The head was also immediately wrapped [447] up securely in a clothing-mat (*kahu*), lest it should be noisily wondered at by those who were strangers or unacquainted with it (*koi umeretia e nga tangata tauhou*). You also ask what instrument was used for cutting off the head of the *mako*. What, indeed! Why, the saw made of the teeth of the *tatere* shark firmly fixed on to a wooden blade (*he niho tatere, he mea hohou ki runga ki te rakau*). You further inquire respecting the number of its teeth. There are eight—that is, large ones from within, and also eight smaller ones of them outside. Besides those there were several much smaller ones in

front or outside (*o waho rawa*), but these I never counted, and therefore cannot give their exact number.”⁷⁰¹

He also wrote (in another and subsequent letter) in answer to my further inquiries: “There are four very large teeth from the beginning, or within. These are called *rei*, and are kept for ear-pendants. Altogether there are eight teeth—that is, four very large ones, and four smaller, making eight in all.⁷⁰² The outside teeth resemble those of the *tatere* shark, and are only termed teeth (*niho*); these have no other name, but those that are kept for ear-pendants are called *au-rei*. Then, you wish to know how the *mako* was captured by us Maoris in the olden times. Listen. This fish was never taken as other sharks (*mango*) were, with hook and bait: none of our fishhooks would be strong enough to hold it, they would soon be broken. Now, when the fishing-canoe was out fishing, and had been a long time there catching fishes of various kinds, suddenly a *mako* would be seen coming leisurely along

701 WC: “*E waru nga niho nunui o roto, e waru hoki o waho mai o era, nga mea iti nei, haunga hoki nga niho o waho kaore au e mohio ki te tatau.*”

702 WC: “*Ko nga niho nunui rawa e wha o te timatanga mai, he rei ena, nga mea e waiho ana hei tau taringa e waru tonu ana niho, e wha nga mea nunui rawa, e wha hoki nga mea tua ririki, ka waru ai.*” As there is apparently a discrepancy in the two letters of my Maori informant respecting the number of the prized teeth of the *mako*, I have given here in these two notes his own precise words; he seems to be very exact. He may, however, have counted them by pairs in his second letter—as the old Maoris always did men, kumara (sweet potatoes), and fish, and a few other things—but, though understood, was omitted by his younger secretary; and, if so, then his number will be quite correct, and the same in both letters.

on the surface of the water (*e hara mai noa ana i te kiri o te wai, ara i te kare o te wai*). Then the man who saw it would shout out to his companions in the canoe, ‘Haul up our land’ (*Hutia mai to tatou whenua*), not naming the fish;⁷⁰³ and when the *mako* was pretty near to the canoe, about three yards off, then [448] the big tempting bait was let low down before it, and on the *mako* seeing the bait it would bend down its head to seize it (*ka tupou te upoko*), when its tail would be upraised above water. Then a noosed rope would be flung over its tail (lasso-fashion) and quickly hauled tight, which would secure the tail within the noose hard and fast. And away would speed the canoe at a fleet rate towards all sides of the sea and sky, being continually turned about in all directions by the fish, the man who had noosed it always holding on to the rope. At last, being exhausted, the *mako* died; then it floated, when its head would be cut off, as I said before. This was our common manner of catching the *mako* fish (*ko tona hii tonu tenei o tenei ika o te mako*), often also called by us a monster (*taniwha*); and hence arose the term of monster-binding (*here-taniwha*), owing to it being securely noosed and bound with a rope flung over its tail.” Here ends the interesting narration of my worthy old Maori correspondent, who died soon after.

I have never seen a *mako* fish, and I am in doubt whether it is yet fully known to science. It is evidently one of the

703 WC: Observe here two things: (1) “not naming the fish,” from a superstitious belief and custom which also obtained in a few matters on shore; and (2) the peculiar cry of the describer, which no doubt had reference to the old myth of Maui fishing up the North Island from ocean’s depths.

deep-water fishes. The first mention of it by skilled scientific observers that I have noticed is in Sir James Ross's "Voyage to the South Seas," wherein it is stated that on nearing the Chatham Islands, in November, 1841 (within a week after leaving their winter quarters and anchorage in the Bay of Islands), "the long-snouted porpoises were particularly numerous. One of these creatures was struck with a harpoon, and in its formidable jaws we found the teeth which the New-Zelanders value highly as ornaments, and which had puzzled us greatly to ascertain to what animal they belonged" (vol. ii., p. 134). Those Antarctic Expedition ships had spent several months in the Bay of Islands, and the officers had frequent opportunities of seeing and examining the teeth of the *mako*, and very likely had purchased some from the Maoris, as they were diligent in acquiring natural specimens, and curios and ornaments of all kinds.

Professor Hutton, in his "Catalogue of the Fishes of New Zealand" (published by the Government in 1872), considered the *mako* to be the "*Lamna glauca* = tiger-shark;" but he says, "The shark from which the Maoris obtain the teeth with which they decorate their ears is probably this species, but I have seen teeth only" (*l.c.*, p. 77).

Subsequently Professor Julius von Haast (in 1874) read a paper before the Philosophical Institute of Canterbury⁷⁰⁴ on the *mako* of the Maoris, which, he says, is *Lamna cornubica*, the porbeagle shark, and not *L. glauca* as had

704 WC: *Trans. N.Z. Inst.*, vol. vii., p. 237.

been supposed [449] by Professor Hutton. But Professor von Haast had only a small young specimen (or, rather, its skin) to examine, which two North Island Maoris, then engaged at Christchurch Museum, pronounced to belong to a young *mako*, and informed him that this fish in its adult state was about 12 ft. long. The animal to which the skin belonged was 4 ft. 10 in. long. Professor von Haast also gives much information relative to the teeth of his small specimen (differing widely from my Maori friend's description given above), their number, form, and size, the colour of its skin, &c. Still, as I take it, there are reasonable doubts as to that specimen being a true *mako*; I think it is highly probable that his two Maori informants had never seen a real *mako* shark.

Couch, in his celebrated work on "British Fishes," in his account of the porbeagle shark, gives a drawing of it from nature, and also others of its teeth and jaws, which appear to be different from those of the *mako*, being much more slender, and semi-terete, undulate, and sharply pointed (vol. i., pp. 41–44).

My object in writing this notice of the *mako* shark is mainly to relate the ancient Maori mode of capturing it.

§ II. OF THE PREPARATION OF BLACK PIGMENT FOR TATTOOING.

The ancient Maoris had more ways than one of obtaining the black substance used in tattooing, which colouring-matter also varied in quality, partly owing to what it was made from; that for the countenance being superior to

that used for the lower parts of the body. One way of obtaining the best kind was as follows:—

First, two proper careful men were selected for the work. This, too, was done with ceremony, they being (for the time) *tapu* (*i.e.*, under the laws of *taboo*)—rigidly set apart. A small kiln-like furnace (*ruangarehu*) was excavated in the side of a hill suitably situated. The substances to be used in burning for their soot—*kauri*-resin (*kapia*) and the resinous veins of white-pine wood (*kapara*)—were got ready; a net made from the *wharanui* flax leaves finely split, composed of very small and close meshes, and beaten well, so as to be rough and scabrous from long broken fibres, in order the better to catch and retain the soot (*awe*), which was intended to adhere only to the network: this net was fixed properly and securely over the top opening or chimney of the kiln, and above it were placed thick mats and suchlike, to prevent the escape of the burning soot and smoke. All being ready, a very calm fine night was chosen for the firing of the kiln—a night in which there should not be the least breath of moving air; and, the kiln being fired, those two men remained all night at their [450] post, attending to their work, carefully feeding the fire. When all the resinous substances were burnt up, and the kiln cold—the calm weather still continuing—the soot was carefully collected and mixed up with the fat of birds, and then given to a Maori dog to eat, which dog had also been early set apart for this work—tied up, made to fast, and kept hungry, that it might perform its part and eat the prepared morsels with avidity. After devouring the mixed food the dog was still kept tied up, and not allowed to eat any other aliment until it had voided the former. When

the fæces were evacuated they were carefully gathered, and mixed up and kneaded with birds' oil and a little water, and, when this mixture became dry and hard, it was put up securely into a large shell, or into a hollowed pumice or soft stone, and laid by carefully, buried in the earth, for future use. It is said to have possessed no disagreeable odour when dry (though it had while fresh), and, though long kept, it did not become bad nor spoil through keeping, which, on the contrary, was said to improve it, and it was very much prized.

It was this pigment, so put up and kept, that was the origin of one of their proverbs, "*Puritia to ngarahu kauri*" = Keep to thyself thy kauri-resin-soot pigment. This saying was used when a person was unwilling to give what was asked, the same being some common thing, and not at all needed by the avaricious owner. But there is a double meaning here, in this simple sentence (proverb)—namely, "You may never require it, or live to use it." (See Trans. N.Z. Inst., vol. xii., p. 145.)

§ III. OF THE MANUFACTURE OF THEIR LONG SPEARS.

Some of their spears were very long. Of these there were two kinds. One kind was made of hardwood, *rimu* (*Dacrydium cupressinum*). This was used in defending their forts and stockades before the introduction of firearms, being thrust through the palisades at close quarters against the legs and bodies of the invaders. The other kind was much lighter, though longer, being made of the light wood of the *tawa*-tree. (*Beilschmiedia tawa*), and used only for the spearing of pigeons when they were sitting on the top of a high tree. This spear was tipped with a flattish serrated bone 3 in.—5 in. long, usually

coarsely barbed on one lateral edge, and sharply pointed; the bone being human, and a portion of that of the arm or leg, and, of course, of their deadly enemies. Seeing that these long spears were always made from heartwood of their tallest trees, it was a mystery to me how they managed to manufacture them, the hardwood ones being from 16 ft. to 20 ft. and the others from 20 ft. to 35 ft. long; and it was not until my first visit to the Urewera Tribe, at Ruatahuna, in the [451] interior beyond Waikare Moana, in 1841, that I discovered how it was effected. This patient performance has ever seemed to me a notable example of one of their many laborious and persevering works. For it must never be forgotten, in considering their ancient laborious and heavy works, especially in hard substances, as wood, bone, and stone, that they accomplished all without the use or knowledge of iron or any other metal.

First, a straight, tall, and sound *tawa*-tree was selected in the forest. This was felled with their stone axes. Its head and branches having been lopped off, it was dragged out into the open ground, and split down the middle into two halves. If it split easily and straight, then it would probably serve for two spears, if each half turned out well in the working. The next thing was to prepare a long raised bed of hard tramped and beaten clay, 35 ft.—40 ft. long—longer than the intended spear—the surface to be made quite regular and smooth (like a good asphalte kerb town walk of the present day). On to this clay bed the half of the *tawa*-tree was dragged, and carefully adzed down by degrees, and at various times, to the required size and thickness of the spear. It was not constantly worked, but it was continually being turned and fixed by

pegs in the ground, to keep it lest it should warp and so become crooked. It took a considerable time—about two years—to finish a spear. The last operation was that of scraping with a broken shell or fragment of obsidian, and rubbing smooth with pumice-stone. When quite finished and ready for use a suitable tall and straight tree was found in, or on the edge of, the forest; its trunk was trimmed of branchlets, &c.; the long spear was loosely fixed vertically to it, so as to run easily through small round horizontal loops girt to the tree, and placed at some distance from each other; the tip of the spear concealed, yet protruding near the topmost branches of the tree; and, as the pigeon is a very thirsty bird (especially, I should think, after feeding on the large fruits of the *tawa* and of the *miro*—*Podocarpus ferruginea*—trees, which are hot and piquant), the Maoris made small corrugated vessels of the green bark of the *totara* tree that would hold water, and fixed such on the top of the tree to which the long spear had been lashed, and by-and-by, when the bird was settled above after drinking (for it is a very quiet bird, sitting long after feeding), the spear was gently pulled down by its owner below on the ground, and sent up with a jerk into the body of the pigeon. I have seen the fixed spear thus used in the forests, and have eaten the bird so captured.

I may here mention that I have also seen those totara-bark dishes, with water in them, fixed high up on the big branches [452] of trees in the woods in the Urewera country, having flax nooses so set over the water as to catch and hold fast the pigeon in its drinking. I have seen pigeons so caught, the Maoris climbing the trees naked with the agility of monkeys to secure their prizes.

From the large amount of labour and the time consumed in the making of a long spear, and its great beneficial use when made, arose a good proverb among them relative to industry in tillage, &c., and to being prepared—“*Kahore he tarainga tahere i te ara*” = You cannot hew a bird-spear by the way. Meaning: Without timely preparation you may die from want of food, though the pigeons are plentiful in the forests near you.

§ IV. OF THE HAIR OF THE TAIL OF AN ANCIENT MAORI DOG.

A dog with a white flowing tail was greatly prized. It was kept in a house, and always slept on clean mats, so that the hair of its tail should not become soiled or discoloured. (The Maoris had no soap, yet they sometimes used soapstone, steatite, and a soft bluish clay for the purpose of cleansing oily hands, &c.)

Tohutohu, the aged principal chief of Tangoio (also a *tohunga*, or priest), once told me of a very curious operation they were in the habit of performing in the olden times on a living Maori dog's tail—namely, to strip the flowing hairs in long narrow lines or strips, somehow connected by the epidermis, so as not to injure the dog, nor to prevent their growing again.⁷⁰⁵ I got him to repeat

705 WC: This peculiar operation of theirs seems to be analogous to that of our country people—namely, the regular and stated plucking of live geese for their quills, formerly extensively used for writing-pens. And here I may remark that it was a good thing that steel pens were invented and came into common use; otherwise, I suppose, under our new English laws against cruelty to animals, the owners of geese would be prohibited from so

his relation twice in order to be sure of it, it seemed so very strange. He assured me that it had been done, that it was a very delicate operation which took a long time, and that it was only effected by a skilled man.

These long flowing white hairs were called *awe*. They were made up neatly into highly-peculiar little queues, each having one-third of its basal length firmly and finely bound round with a very fine cord, spun of best picked flax-fibre, looking somewhat like the silver string of a violin. These were used [453] for ornamenting the chiefs' carved staffs of rank, made of hardwood and polished (*hani* at the north, *taiaha* and *maipi* at the south), and were hung around the head of the staff beneath the fixed red feathers taken from under the wings of the large parrot. A large number of those little flowing hair queues (sometimes thirty or more) would be so hung around a single staff, and they remained in good preservation for many years, only becoming soiled.

As may naturally be supposed, the ancient Maoris had several proverbs derived from their dogs, all more or less natural, and some notable and laughable. A few specimens I will give:—

“He hiore tahutahu” = An often-singed tail. Taken from a skulking dog lying before the fire, and getting its tail

plucking them. I am led to allude to this from having lately read in the Home papers of country farmers having been prosecuted and fined for tying the legs of their fowls when bringing them to market for sale, and others, also, for having put too many live fowls into one basket. *Jam satis!*

repeatedly burnt. Moreover, such a dog would be early killed for food. Used for an idle fellow.

“He hiore hume” = A tail drawn down beneath. *“He whiore hume tenei tangata”* = This man is a dog’s-tail, clapped under, between its legs (and sneaks away afraid). Used of cowards. N.B.: A very severe saying with a warlike people.

So that from these sayings we may conclude that the habits and actions of their now unknown Maori dog were much the same as those of other dogs.

§ V. OF THEIR ANIMAL PETS.

Besides their little domestic dog the ancient Maoris had five birds which they occasionally kept in captivity—two of them for their prized feathers; one for use; one for its company; and one solely on account of its repeating a taught Maori song or recitation, and possibly, also, for its beauty, and for its prominently possessing in its plumage those two contrast colours (black and white, or nearly so) which were so highly prized by the old Maoris.

Those two birds kept for their feathers were the *huia* (*Heteralocha acutirostris*) and the *kotuku* or *kautuku* = the white heron (*Ardea egretta*). Of these two birds I have seen but very few in captivity, and always pitied them, as they must have had a wretched existence, and that mainly from lack of their proper food, and, in the case of the white heron, the miserable low cage in which the poor bird was confined not permitting it to stand erect. The Maoris might, however, have succeeded better with them in the olden time, when they had less to

occupy their time and distract their attention—and perhaps they did so. One acquainted with their thoughts and old manners and customs is led to believe that they so acted, from the fact of their having suitable natural proverbs relating to this bird, showing that they were close observers of its [454] economy, which they so highly approved as to apply it proverbially as a fitting example to their chiefs—e.g., “*He kotuku kai-whakaata*” (*Eng.*: The white heron eats leisurely, after viewing its food and its own shadow in the still clear water). This is said of a chief who looks after due preparations being made for his expected visitors; also, of one who quietly and courteously awaits the arrival and sitting of others to their repast before he eats his own food.

The Maoris were always passionately fond of the plumes of these two birds, and prized them highly among their most valuable possessions, making beautifully-carved boxes, with their exact fitting lids, of hardwood, to keep their feathers in—real caskets. These two birds were also not common. The tail-feathers alone of the *huia*, being black, tipped with white, were used for adorning the heads of the chiefs; while several of the pure-white feathers of the *kotuku*, from various parts of its body, were of service. Those from within its wings, and near their junction with the body, were of two kinds—the larger of them were called *meremere*, and the smaller *awe*.⁷⁰⁶ These last were sometimes stripped off with the

706 WC: I may here, in a note, point out the curious and apparently contrary meaning of this short word of three letters—*awe*. I have already mentioned it, in section ii. of this paper, as the proper name for soot (which is pure black), while here it is also the proper name for the fine gauzy feathers of this bird (which are pure

skin adhering, so as to form a ball-like bunch to be worn in the ears. The larger feathers on the outside (secondaries, wing-coverts, and scapulars) were termed *waitiripapa*; while the extreme feathers of its wings (primaries) were called *hiku-rangi*. This bird, so comparatively common in the South Island, is very rarely seen here in the North Island: in all my travelling I have only seen four between Napier and Cook Strait, and those flying singly and at different times. One was shot here in Hawke's Bay, in the freshwater lagoon between Napier and Meanee, upwards of forty years ago, by W. Morris, the old whaler, who then resided at Rangaika, beyond Cape Kidnappers. He was on a visit in his whaleboat to me at Waitangi at the time, coming round by Ahuriri, when he came across the bird, and, having shot it, was bringing it to me, when he was stopped by the chief Tareha, who claimed the bird as being shot on his grounds. [455]

This was quite in accordance with Maori custom, and, I may say, with our English customs too.) A long altercation took place between them, but Morris was obliged to give way to save his gun. He afterwards called on me and told me of the circumstance, and how much he

white). This same name is also given to similar white feathers of the gannet and of the albatros. And in section iv. (*supra*) it is again used as the proper name for the long white flowing hairs of a Maori dog's tail. So that it would appear as if the ancient Maoris put aside the colour and the origin of the substances, and only considered their common lightness and airiness. This, again, reappears in this same word being used adverbially for "soon," "early," "in time," with especial reference to travelling, walking to a place, &c., as if denoting quickly, lightly moving.

regretted it. The next day Tareha himself, with a whole posse of his wives and people, came in a canoe bringing me the bird wrapped up in a new garment (Tareha having heard from Morris that he intended it for me); but they had plucked out all its prized feathers, and now wanted £1 (or "a golden sovereign") for what remained. For some time I would not take it at all, seeing it was spoiled as a specimen for preserving; but at last (and to please him) I took it, giving him 4s. for it: and the skin (though deprived of its choice plumes), with head and feet, I preserved with arsenical soap, and sent it to Professor Owen through Sir W.J. Hooker, as, at that time, I considered it to be a new species, and unknown. Another specimen of this bird was kept in a cage by the Maoris at Porangahau, who had managed to snare it alive in the neighbouring stream. They fed it very sparingly with small fresh-water fish, but placed them in such a shallow saucer-like vessel as strongly to remind me of Æsop's fable of the fox and the stork—that is, of the fox's invitation entertainment. It soon, however, died—before that its prized feathers had newly grown. Of course its old feathers were plucked out when it was captured. From the great scarcity of this bird, and its high value, it became proverbial—e.g., "*Kotuku rerenga-tahi*" = Kotuku once (seen) flying. So that the rare visit of any great and friendly chief or welcome visitor was likened to its flying, or rare appearance.

The one bird they kept for use was the common large brown parrot = *kaakaa* (*Nestor meridionalis*). This was used as a decoy-bird to enable them to catch wild parrots. It was always kept securely fastened by one of its legs, enclosed within a bone circlet, and tied by a short thick

cord to a hard-wood (*manuka*) spear, but allowed to run up and down the spear, a loose loop being at the end of the cord. It was of great service to them in their clever parrot-catching, and sometimes lived to a great age notwithstanding its hard, confined, and wretched life. This was the only one of all their bird pets that was pretty common among them, especially in the interior, in the forest districts.

There are several good old proverbial sayings concerning the parrot—*e.g.*—

“*He kaakaa wahanui*” = A noisy-mouth parrot. Applied to a chatterer, or boasting person.

“*He kuukuu ki te kaainga, he kaakaa ki te haere*” = A pigeon at home, a parrot abroad. The New Zealand pigeon is a silent bird, and remains quietly sitting on the high trees; [456] the parrot is a noisy screamer, and flies about, making the forest resound with its loud cries. This proverb is applied to an inhospitable chief: he does not raise the cheerful cry of “Welcome!” to travellers nearing his village; but when he travels, then, on approaching any place, he sounds his trumpet to get food prepared, and afterwards finds fault with the victuals given him.

“*He kuukuu tangae nui*” = A pigeon bolts its food. Used of a greedy fellow never satisfied.

“*He kaakaa kai honihoni*” = A parrot eats leisurely, bit by bit. Said to a person who eats moderately and slowly.

The fourth of their pets was a sea-bird, a large gull = *ngoiro*, also *toroa* (*Larus dominicanus*). This one fared better than any of the others, as it had its liberty, and ran about, and into the sea, and so (in part) fed itself with its

own natural food, and back again to the village, which it seemed to take up with—more so than with the people of the place the dogs and the cats. It was only found in the sea-coast villages, and was kept merely for sociality and companionship. The bird was taken away young from its parents, and fed by hand; having had its pinions broken off, it could not now fly. It often emitted a mournful cry when wandering about in the village, which, to me, was not pleasant to hear, as I always fancied it was bewailing its hard lot. Of this bird, too, they had their proverbial sayings, one of which is very neat and pleasing—“*Me he toroa ngungunu*” = Like a gull folding its wings up neatly. Used of a neat and compact placing of one’s flowing mats or garments about one’s person, especially by orators when making a speech *à la Maori*, running up and down.

Their true pet, however, was the *tuumi* = parson-bird (*Prosthemadera novæ-zealandiæ*). This bird was taken great care of, and kept in a decent rustic cage, entirely for its Maori song, which it was diligently taught. I have known some to live several years in captivity, to look well in their fine plumage, and to sing or repeat words and sentences parrot-like, but with more of life and energy, as if the bird delighted in being noticed, and was showing off. The old Maoris had an especial Maori song which this bird was brought to repeat. Some of its sentences were very quaint—*e.g.*, (in English) thus: “Lo! hast thou heard? Here is the welcome visitor. Where from? Draw nigh. Call hither the dog. Come hither, welcome visitor. From the south is this welcome visitor? From the north is this welcome visitor?” &c. These words were extremely applicable to a party of friends

arriving at a village; and if the *tuuīi* in the olden time was so well taught by its owners as to rattle them out on the arrival of visitors it must have been very pleasing to them. At all events, [457] they are a standing memorial to the well-known exuberant hospitality of the ancient Maori people.⁷⁰⁷

The finest tame *tuuīi* I ever saw was the property of Mr. W.G. Puckey, of the Kaitaia Church Mission (that was in 1838). This bird had been in Mr. Puckey's possession several years, and when it rattled off its Maori song it would also inflate its body, appear bulky, and ruffle up its glossy feathers, and so make itself look nearly twice its real size, and all the time move up and down its perch as if with glee. Truly it was a pretty sight to see and hear it. An elegant proverbial saying respecting this bird I may here mention—"Me he korokoro *tuuīi*" = As eloquent as the throat of the sweet-singing parson-bird. Spoken in praise of a good orator.

A pleasing anecdote of another *tuuīi* may here be mentioned. When H.M.S. "Buffalo" was here in New Zealand in 1834, felling *kauri*-pine spars and loading them for the Government dockyards at Home, and consequently had to remain some time in the New Zealand waters, several of our endemic birds were captured alive to be taken to England, and among them, naturally enough, were many *tuuīis*. On the passage Home, however, all the *tuuīis* died save one, and that was

707 WC: Mention is also made in an interesting old story of a chief's son, in quest of his father, having taught two tamed birds — a huia and a kotuku—to repeat a sentence in Maori. See *Trans. N.Z. Inst.*, vol. xiii., p. 55.

the property of a common sailor on board. As the ship neared England large sums were offered "Jack" by the officers for his bird; but he steadily refused them all, saying (good-sailor-like) the bird was for his darling girl, Polly.

I may also mention that among their very ancient legendary stories is an interesting one of an immense saurian (a man-eater) that was the pet of the chiefs of that district (Trans. N.Z. Inst., vol. xi., pp. 95, 100).

§ VI. OF THE FINE SMELLING-SENSE AND TASTE OF THE ANCIENT MAORIS FOR PERFUMES.

I have already more than once, and in former papers read here before the Institute, touched on the superior powers of sight of the ancient Maoris;⁷⁰⁸ and it has often occurred to my mind that they also possessed a very keenly developed sense of smell, which was largely and quickly shown whenever anything sweetly odoriferous, however fine and subtle, had been used—as eau de Cologne, essence of lavender, &c. Indeed, this sense was the more clearly exhibited in the use of their own native perfumes, all highly odorous and collected with labour. Yet this sensitive organization always appeared to be the more strange when the horribly stinking smells of [458] two of their common articles of food—often, in the olden times, in daily use—are considered: rotten corn (maize, dry and hard, in the cob) long steeped in water to soften it, and dried shark. The former, however, has long been

708 WC: *Trans. N.Z. Inst.*, vol. xiv., p. 67, &c.

abandoned; yet at one period every village at the North had its steeping-pit.

In a paper I read here at our June meeting,⁷⁰⁹ I mentioned some of the very small Hepaticæ (*Lophocolea* and *Chiloscyphus* species) as being used for perfume by the Maoris, who called them *piripiri*. Their scent was pleasant, powerful, and lasting. Hooker, in describing those plants, has mentioned it from dried and old specimens. Of one species, *Lophocolea pallida*, he says, "odour sweet;" of another, *L. novæ-zealandiae*, "often fragrant;" of another, *L. allodontæ*, "odour strong, aromatic;" of another, *Chiloscyphus fissistipus*, "a handsome strongly-scented species;" and he has further preserved it to one of them in its specific name, *C. piperitus*, "odour of black pepper."

There were also two or three ferns—viz., *Hymenophyllum sanguinolentum*, a very strong-smelling species, hence too its specific name; dried specimens not only retain their powerful odour, but impart it to the drying-papers: *Polypodium pustulatum*, having an agreeable delicate scent: and *Doodia fragrans*, a neat little species; this last was so far esteemed as sometimes to give name to the locality where it grew, as *Puke mokimoki*,⁷¹⁰ the little isolated hill which once stood where the Recreation-ground now is in Napier; that hill having been levelled to fill in the deep middle swamp in Monroe Street.

709 WC: See *Trans. N.Z. Inst.*, vol. xii., p. 148.

710 WC: Mokimoki Hill, from mokimoki, the name of that fern.

One of the *Pittosporum* trees, *tawhiri* (*P. tenuifolium*), also yielded a fragrant gum; but the choicest and the rarest was obtained from the peculiar plant *taramea* (*Aciphylla colensoi*), which inhabits the alpine zone, and which I have only met with near the summits of the Ruahine Mountain-range, where it is very common and very troublesome to the traveller that way. The gum of this plant was only collected through much labour, toil, and difficulty, accompanied, too, with certain ceremonial (*taboo*) observances. An old *tohunga* (skilled man, and priest) once informed me that the *taramea* gum could only be got by very young women—virgins; and by them only after certain prayers, charms, &c., duly said by the *tohunga*.

There is a sweet little nursery song of endearment, expressive of much love, containing the names of all four of their perfumes, which I have not unfrequently heard affectionately [459] and soothingly sung by a Maori mother to her child while nursing and fondling it:—

Taku hei piripiri,
Taku hei mokimoki,
Taku hei tawhiri,
Taku kati-taramea.

My little neck-sachel of sweet-scented moss,
My little neck-sachel of fragrant fern,
My little neck-sachel of odoriferous gum,
My sweet-smelling neck-locket of sharp-pointed
taramea.⁷¹¹

711 WC: See above, Art. XXXVII.

Here I may observe that to the last one of the four the word *kati* is prefixed: this word—meaning, to sting, to bite, to puncture, to wound sharply and painfully—is added to indicate the excessive sharpness of the numerous leaves and leaflets of the *taramea* plant (hence judiciously generically named by its early discoverer, Forster, *Aciphylla* = needle-pointed leaf), and the consequent pains, with loss of blood, attending the collecting of its prized gum, thus enhancing its value.

This natural and agreeable little stanza, one of the olden time, has proved so generally taking to the Maori people that it has passed into a proverbial saying, and is often used, hummed, to express delight and satisfaction—pleasurable feelings. And sometimes, when it has been so quietly and privately sung in a low voice, I have known a whole company of grey-headed Maoris, men and women, to join in the singing: to me, such was always indicative of an affectionate and simple heart. How true it is, “One touch of nature makes the whole world kin”!⁷¹²

In the summer season the sleeping-houses of their chiefs were often strewed with the large sweet-scented flowering grass *karetu* (*Hierochloe redolens*). Its odour

712 WC: It is pleasing to notice that the observant artist Parkinson (who was with Sir Joseph Banks as his botanical draughtsman, and Cook on his first voyage to New Zealand) makes special mention of those little sachels in his Journal, saying of those Maoris who came off to the ship in their canoes, “The principals among them had their hair tied up on the crown of their heads with some feathers, and a little bundle of perfume hung about their necks” (*Journal*, p. 93). Captain Cook, also, has similar remarks respecting the young women.

when fresh, confined in a small house, was always to me too powerful.⁷¹³ [460]

Here, in conclusion, I may briefly mention an instance of their correct discrimination on the contrary side, clearly showing how well and closely the ancient New-Zealander agreed in his opinion of a plant with the highly-civilised scientific visitor already named above, the botanist Forster. Forster named the *Coprosma* genus from the foetid odour of the first species he discovered in the South Island, which signification he also continued in its specific name, *C. faetidissima*: this shrub also bears a similar Maori name, *hupiro*, highly expressive of its very disagreeable smell.

§ VII. OF THEIR HOUSE-DECORATIONS.

These were mainly of three kinds: 1. Their peculiar manner of making a smooth surface to the large flat and broad hardwood pilasters of their principal houses by dubbing them down. These were closely worked into

713 WC: Sir J.D. Hooker thus writes of this fine, sweet-smelling grass in his *Flora Novæ Zelandiæ*: "A large and handsome grass, conspicuous for its delicious odour, like that of the common vernal grass (*Anthoxanthum*) of England, that gives the sweet scent to new-made hay" (l.c., vol. ii., p. 300). A closely-allied northern species (*H. borealis*), which was also supposed to be found here in New Zealand, is also used on the Continent of Europe for similar purposes. In some parts of Germany it is dedicated to the Virgin Mary (hence, too, its generic name of *Hierochloe* = sacred grass), and is strewed before the doors of the churches on festival days, as the sweet sedge (*Acorus calamus*) is strewed on the floor of the cathedral at Norwich for the same purpose at such seasons.

little shallow semi-symmetrical ridges and hollows, somewhat imitating the trunk of the larger fern-trees; and the work was called, after them, *ponga*, *pongaponga*, and *mamaku*, and all done, of course, with their stone adzes. It had rather a pleasing effect. 2. Their strange and bold regular designs drawn on the larger roof-rafters and beams of their chiefs' houses, which had been previously smoothed and prepared, reminding the beholder at first sight of stencil work. These traceries were of various patterns, and coloured red and white. All the patterns of their ornamental-border carvings and coloured tracings bore different proper names; and so of branches or parts of the figures, when compound, as *mango-pare* (the hammer-headed shark), *hikuaua* (herring-tail),⁷¹⁴ *kowhai*, from the flower of the *kowhai*-tree, &c.; and all from real or fancied resemblances—correlations, as it were, of the Maori mind. One, in particular, I may mention and explain: This pattern was called *rengarenga*, from being an imitation of, or ideal association with, the curved anthers of the flowers of that plant, the New Zealand lily (*Arthropodium cirrhatum*). Here we have another curious and pleasing instance of coincidence of ideas in natural close observation and naming between two widely opposite peoples, the ancient New-Zealander and the highly-civilised European—the German botanist Forster who accompanied Cook on his second voyage to New Zealand, and who gave the appropriate specific name of *cirrhatum* to this plant from its peculiar closely-curved and revolute anthers.⁷¹⁵ 3. Their striking and neat

714 WC: Lit. tail of the *aua*, a small sea-fish, *Agonostoma forsteri*.

715 WC: I give in a note that portion of Forster's full and able description of this fine plant which applies to its anthers: “*Antheræ*

variegated reedwork, [461] displayed in the inner walls and ceilings of their best houses, and also in their verandahs.⁷¹⁶ 4. Their famous boldly carved and sculptured work. This, however, I omit, from want of room, and because much of it yet remains with us, as may be seen here in our local Museum.

§ VIII. OF THE PECULIAR MODES OF PREPARING SOME ARTICLES OF ANIMAL FOOD, AS PRACTISED BY THE ANCIENT MAORIS.

Under this head I would briefly notice a few which were both singular and strange, and confined to themselves, in which also they excelled; these (like many other of their good and useful preparations) having long become obsolete among the Maoris. I am the more inclined to do this from my having already given in a former paper⁷¹⁷ their striking and curious modes of obtaining and preparing and laying up in store some of their wild indigenous vegetable food for winter use, particularly the

oblongæ erectæ, bisulcæ, candidæ. Barbata corpuscula duo filiformia, purpurea, pubescentia ab antherâ ad basin filamenti longitudinaliter dependentia, ibique cirrhi in modum revoluta, parte cirrhi formi flavissimâ." Forster, however, had described it as being a species of *Anthericum*; but Brown made a new genus of some Australian plants (*Arthropodium*) very near to the old Linnæan genus *Anthericum*, and so included this one. I see Sir J.D. Hooker has given Brown's name after our New Zealand plant in his N.Z. Flora, but I think Forster's name should have remained.

716 WC: For more particulars, see my note about the same, *Trans. N.Z. Inst.*, vol. xiv., p. 50.

717 WC: *Trans. N.Z. Inst.*, vol. xiii., p. 3.

fruits of the *karaka* (*Corynocarpus laevigata*) and of the *hinau* (*Elaeocarpus dentatus*), the pollen of the *raupo* (*Typha angustifolia*), and the roots of the *aruhe* = common fern (*Pteris esculenta*).

1. Of their little rat, once so plentiful and now extinct. This animal was sometimes prepared in this way for their chiefs' and first-class visitors' meal: It was carefully singed, and so denuded of its fur, and then its bones were broken within the body and extracted by the anus, without breaking the skin; this done, it was cooked in their earth-ovens, and, being very fat, made choice plump morsels, somewhat resembling large sausages. The contents of its stomach (being a frugivorous animal) were also eaten, much as in England those of a woodcock or snipe. Another mode adopted by the old Maori cooks was to stuff small rats into the belly of a large one. For both of these gastronomic preparations they had proper names.

In the early times, before the creation of the colony, when lands were sold at the North, I have known a chief to lay claim to a share of the price paid for the land from the fact of his ancestors and himself being entitled to the fat of rats caught thereon; and such claim was allowed.

[462]

2. Of fish they made large store in the summer season by drying them for winter use. Of these I would especially mention the mackerel (*tawatawa* of the Maoris), which they caught in great numbers in their big seine-nets.⁷¹⁸

718 WC: Cook's remarks on the great plenty of mackerel he obtained from the Maoris are worthy of a notice. While at Mercury Bay, in November, 1769, Cook writes: "The natives who came to the ship this morning sold us for a few pieces of cloth as much fish

This fish was managed thus for storing: They gutted them, took off their heads and tails, and split them into halves, and cooked them by steam in large earth-ovens made expressly for the occasion on the sea-beaches, always using a peculiar kind of wood for heating the ovens. When cooked the fish were carefully separated unbroken, and placed on raised stages to dry in the sun and wind, and when dried packed in large flax baskets for winter use. This fish, once so very plentiful, arriving annually on the shores of New Zealand in immense shoals (much as it does on the shores of England), has now and for many years past become very scarce.

Of the smaller kinds of shark (generally known by the common appellative of *mango*), and also of fresh-water eels (common name *tuna*), the old Maoris caught and dried great numbers for winter use, and perhaps this is still being done by them in several suitable localities at the North. Of the larger dried eels I have myself eaten, and considered them very good. In drying them they split them down the back, as the Cornish fishermen formerly did the great sea-eel, or conger, for salting and drying.

of the mackerel kind as served the whole ship's company, and they were as good as ever were eaten." And, again, he subsequently writes: "On the 9th, at daybreak, a great number of canoes came on board loaded with mackerel of two sorts—one, especially, the same with those caught in England. We imagined the people had taken a large shoal... they were very welcome to us. At 8 o'clock the ship had more fish on board than all her people could eat in three days; and before night the quantity was so much increased that every man who could get salt cured as many as would last him a month." (*Voyages*, vol. ii., pp. 335, 336, and 440.)

A small, delicate river fish—the *inanga* (of at least two species, yet going together in small shoals, and both distinguished by the Maoris)—was also in some places caught in large quantities in the summer season, and carefully dried in the sun for storing. Of these, also, I have frequently partaken in travelling among the Maoris, and liked them very much. My usual plan was to put a handful of them into the iron pot to boil with the potatoes, when the potatoes were nearly quite cooked. [N.B.—There were neither mutton nor sheep in those days.]

They also dried for winter use large quantities of bivalve [463] shellfish of different kinds of cockles, especially the *kokota* (*Mesodesma novae-zealandiae*). These were first cooked in their shells in earth-ovens, and then the fish extracted and dried in the sun. Of course, these and all kinds of their dried animal food were softened when required for use, in cooking by steam in their close earth-ovens.

But the most curious mode of preparing and drying was that practised on their crayfish (*koura*). This perfectly astonished me when I first witnessed it. At the proper summer season (November) this crustacean would be caught in great numbers, and taken on shore near to a running stream of fresh water. Into this water they would be securely and closely packed in rows across the stream, like tiles on a house-top, and kept down with stones placed upon them. When dead they were taken out, and their shells stripped off. These came off very easily, and the whole body of the fish, with its legs and feelers, came out from the shell in one piece unbroken. These were quickly prepared, flattened, with their legs, &c., confined

and compressed on their bodies, and hung up high in tiers on erected hollow stages in the wind and sun to dry, and when dried were securely packed into flax baskets. Each fish when dry presented a most curious appearance—small, thin, light in weight, and whitish, somewhat resembling a half-baked scone. A stranger would be sure to be deceived from their greatly-altered appearance—scarcely a trace of their legs, &c., to be seen—merely a small oblong cake of tough fish, in its dried state, and always considered a *bonne bouche* with the Maoris, and, like the other kinds of dried sea-fish, often sent into the interior as presents.

§ IX. OF THEIR TEXTILE MANUFACTURES.

These were formerly prominent among the great industrial achievements of the Maoris, and always elicited the admiration of their wondering visitors.

I divide them into two great classes—(1) of garments, which were woven; and (2) of threads, cords, lines, and ropes, which were spun.

Nature had given to the Maoris one of her choicest gifts in the well-known flax plant (*Phormium*), of which there are two ascertained and valid species (*P. tenax* and *P. colensoi*) and several varieties. These plants are pretty general throughout New Zealand, and are well known to the Maoris by the common names of *harakeke*, *haranui*,

wharariki, and *tihore*—excluding those of the many varieties, as known to them.⁷¹⁹ [464]

So that what they may have lost on the one hand through not having the valuable wild edible fruits of other South Sea islands (as the cocoanut, bread-fruit, plantain, &c.) they more than merely gained in their flax plant, which is also common, and almost endemic, being only found outside New Zealand in Norfolk Island.

And here I may briefly mention an anecdote of the flax plant. On my arrival in this country the Maoris (who knew nothing, or very little, of any other land) would often inquire after the vegetable productions of England; and nothing astonished them more than to be told there was no *harakeke* growing there. On more than one occasion I have heard chiefs say, "How is it possible to live there without it?" also, "I would not dwell in such a land as that." This serves to show how highly they valued it. Moreover, at first and for many years the principal export from New Zealand prepared by the Maoris was the fibre of this plant—all, too, scraped with a broken shell, leaf by leaf.

1. *Of their Woven Articles (or Garments).*—I do not intend to say much of them in this paper. Many of them are well known, and still to be found in use among the Maoris, but their manufacture has for many years sadly deteriorated: indeed, I have not seen a newly-made first-quality clothing-mat for the last twenty to thirty years, and I very much doubt if such can now be made at all.

719 WC: Sir James Hector, in his book on the *Phormium* plants, enumerates fifty-five named varieties; but it is doubtful whether more than half of that number are permanent ones.

Not that the art of weaving them has been entirely lost, but the requisite taste, skill, and patience in seeking and carefully preparing and using the several parts (including their dyes) are no longer to be found among the Maoris. I sometimes indulge in a contemplating reminiscence—an idea—a pleasing reverie of the long past—of great gatherings of Maoris, tribes and chiefs; and at such times the figures of some head men I have known, clothed in their handsome, clean, and lustrous dress-mats (*kaitaka* and *aronui*), would stand forth in pleasing high relief. The close and regular weaving of such flax dresses, having their silky threads carefully selected as to fineness and uniformity of colour, and their smooth, almost satiny, appearance, as if ironed or calendered when worn new, was to me a matter of great satisfaction—a thing to be remembered—"a joy for ever."

Those best dress-mats were always highly prized, both by Maoris and Europeans, and brought a high price. I well recollect a young lady, daughter of very respectable early English settlers in the Bay of Islands, who, when she came across the inner harbour in a boat with her parents to attend the English Church service on Sunday mornings in the Mission chapel at Paihia, often wore one of them folded as a shawl, and to me it seemed a neat and graceful article of dress. [465]

Three things more in connection with these fine mats I will just relate: one, the cross-threads in weaving were always of a different sort of flax—the weft and the woof of these mats were not both taken from the same kind of flax; the second, that extremely soft lustrous appearance was given to the flax-fibres by repeated tawing done at different times—it was a pretty sight to see the various

skeins of flax-fibres in their several stages of preparation neatly hung up in the weaving-shed; the third, that in the weaving of one of these garments, if a thread showed itself of a different shade of colour, that part of the garment was carefully unravelled to take it out, and to substitute another better suited in its stead. It was also from this superior knowledge and close attention to their work that the principal chiefs frequently took women who were clever at making those things to be their wives, in order to secure to themselves their valued manufactures.

They also wove very good and useful floor- and bed-mats of unscraped flax-leaves, split into narrow lengths and carefully bleached in the sun—these were very strong and lasting; also baskets and kits of all sizes. Some of them were woven in regular patterns with black (dyed) and uncoloured flax; others were skilfully and pleasingly semi-damasked (if I may so term it) by changing sides to the flax-leaves used to form the pattern, the upper side of the leaf being smooth and shining, the under side not shining and of a glaucous colour. The little kit, or basket, for a first-born child was often a little gem of weaving art, and made by the mother.

Besides the flax plant they had other fibrous plants whose leaves and fibres were also used in making articles of dress: (1.) The *toii* (*Cordyline indivisa*), of which they made black everlasting wraps or cloaks. The making of these was confined to the natives of the mountainous interior, where alone those plants grow. (2.) The long orange-coloured leaves of the *pingao* (*Desmoschænus spiralis*), a prostrate, spreading seaside plant, also afforded them good materials for weaving useful folded

belts, which were strong, and looked and wore well, and were highly valued. (3.) The climbing *kiekie* (*Freycinetia banksii*) was also used; likewise the long, slender, and soft leaves of the *kahakaha* (*Astelia banksii*), but not frequently. (4.) Of the leaves of the common swamp plant *raupo* = bulrush (*Typha angustifolia*), they formed large sails for their canoes. These leaves the Maoris curiously laced together. (5.) I should not omit to mention their flying-kites (*pakaukau* and *manuaute*), formerly in great esteem among them, and made of the manufactured bark of the *uate* shrub = paper-mulberry (*Broussonetia papyrifera*), which was formerly cultivated by the ancient Maoris for its bark. Inferior ones, however, were made [466] of the prepared leaves of some of the larger sedges. They were prettily made, requiring both time and skill in their construction, and much more resembled a bird flying than our English ones. They always served to remind me of those of the Chinese, as we see them in their own drawings and on their chinaware. The old chiefs would sometimes quietly spend hours amusing themselves in flying them and singing (*sotto voce*) the kite's song, using a very long string.⁷²⁰ Kites being flown at any village or fort was a sure sign of peace. These, too, gave rise to proverbs, some being quaint and highly expressive. A pleasing one I give as a sample: "He *manuaute e taea te whakahoro*" = A flying-kite made of paper-mulberry bark can be made to fly fast (away, by lengthening the cord). Used by a

720 WC: See an interesting historical tradition respecting such (*Trans. N.Z. Inst.*, vol. xiii., p. 48).

lover, expressive of impatience at not being able to get away to see the beloved one.

2. *Of their Spun Fibrous Articles.*—These were very numerous in kind, size, and quality, according to the particular use for which they were required; and, while the larger number of them were composed of scraped and prepared flax-fibres there were also other fibrous-leaved plants used by the Maoris, particularly the leaves of the erect cabbage-tree = *tiī* (*Cordyline australis*) and of the *kiekie*, already mentioned. Here, too, in this department, the different kinds or varieties of the flax would be used for making the different sorts of threads, cords, and ropes, some of the varieties of flax enduring much greater strain when scraped and spun into lines than others; and of such their deep-sea fishing-lines were made. It was ever to me an interesting sight to see an old chief diligently spinning such lines and cords—always done by hand, and on his bare thigh. The dexterity and rapidity with which he produced his long hanks and coils of twine and cord, keeping them regular, too, as to thickness, was truly wonderful. Some of their smallest twisted cords or threads were very fine. Such were used for binding on the barbs to their fishhooks, and for binding the long queues of dog's hair to their chiefs' staffs. One of those peculiar cords was a very remarkable one; it was a small cord, bound closely round throughout its whole length with a much smaller one (something like the silver or fourth string of a violin). I never saw this kind but once, and that was at the East Cape, in 1838. A specimen of it I shall now exhibit. This cord was used for a single and particular purpose, attached to the small under-aprons of girls—chiefs' daughters.

Their larger cords and ropes were composed of several strands, well twisted and put together. Besides their round [467] ropes so made, they had also flat ones of various widths, which were plaited or woven, resembling our webs and bands, and much used as shoulder-straps in carrying back-loads; also double-twisted ropes, and three-strand ones; likewise a remarkably strong one that was four-sided. This was made of the unscraped leaves of the cabbage-tree, that had been gathered, and carefully wilted in the shade, and then soaked in water to make them pliant. It was used for their anchors, and other heavy canoe and house requirements. The leaves of the flax would not be suitable for this purpose. I have had all those different kinds of cords and ropes made for me in former years, but I much fear the art of making them is lost.

There were also their nets for catching fish and for other purposes, with their meshes of various dimensions. Their smaller ones (hand-nets) were made of all manner of shapes and sizes. Some of them were dexterously stretched over circular skeleton framework. And their large seine-nets, used for catching mackerel and other summer fish that swam in shoals, were very long and very strong, made of the leaves of flax, split and prepared, but not scraped, and completely fitted up with floats, and sinkers, and ropes, and other needful appurtenances. Cook, who was astonished at their length, has written much in praise of them. I make one striking quotation: "When we showed the natives our seine, which is such as the King's ships are generally furnished with, they laughed at it, and in triumph produced their own, which was indeed of an enormous size, and made of

a kind of grass [*Phormium*] which is very strong. It was five fathoms deep, and by the room it took up could not be less than three or four hundred fathoms long.”⁷²¹
(*Voyages*, vol. ii., first voyage, pp. 369, 370.)

In residing at Dannevirke, in the Forty-mile Bush district, during several months, I have often noticed the Maoris from neighbouring villages coming to the stores there to purchase tether and other ropes and lines (large and small) for their use with their horses, ploughs, carts, pigs, &c., while on their own lands and close to them the flax plants grew in abundance. These Maoris had very little to occupy their time, and could easily have made common lines and ropes for their own use if they knew how to spin them as their fathers did, and also possessed their forefathers’ love of work.

721 WC: An interesting historical tragic story of the cleverly-planned taking and death of a large number of Maoris in one of these seine-nets, together with the fish (illustrating what Cook has written of their immense size), and of the deadly warfare that followed, is given in the *Transactions N.Z. Institute*, vol. xiii., p. 43.

1891 Status quo: A Retrospect.—A Few More Words by way of Explanation and Correction concerning the First Finding of the Bones of the Moa in New Zealand; also Strictures on the Quarterly Reviewer's Severe and Unjust Remarks on the Late Dr. G.A. Mantell, F.R.S., &c., in connection with the same.

Transactions of the New Zealand Institute 24: 468-478.

[*Read before the Wellington Philosophical Society, 24th February, 1892.*]

Mark now, how plain a tale shall put you down.

SHAKESP., "K. Henry IV.," Part I., Act 2.

No pleasure is comparable to the standing upon the vantage-ground of truth.

BACON, Essay I., "Of Truth."

My attention having lately been called to a book published at Wellington by the Government in 1889, entitled "The Literature relating to New Zealand: a Bibliography," by J. Collier, I obtained a copy.

In looking into it I was greatly surprised on reading the following remark made by the compiler (p. 134): "Dr. Mantell sought to claim for Mr. Colenso priority in the discovery of the struthious character of the moa. The *Quarterly Review*, xc., 404, 405, note, disposes of the claim. Professor Owen's first memoir was despatched to New Zealand in December, 1839, and received in 1840. Mr. C.'s paper, dated May 1, 1842, appeared in

Tasmanian Journal, vol. ii., No. 8, 1844.”⁷²² And, although this note of the Quarterly Reviewer was made forty years ago, I had never before heard of it.

I much regret this, for I had again written on the moa in 1879,⁷²³ fully and exhaustively, as I then supposed, and so had quite done with it.

On the other hand, I am pleased in now detecting that remark and the note, as I think I shall be able clearly to show its error, and this with respect to the late Dr. Mantell as well as to myself.

As a matter of course, I sought to know much more than Collier’s brief remark communicated. I endeavoured to obtain a copy of the *Quarterly Review* vol. xc., but for some time failed. None were to be found in Napier, and, as far as I could learn by repeated inquiry, none in Wellington—save, probably, in the General Assembly Library. Consequently I [469] made application there, and was promptly and courteously supplied with the volume required.

The Reviewer’s “note” in question is a very long one, amounting to nearly a whole page in quantity and of very small type. It seems to me as if a certain infelicitous animus pervaded it, with particular reference to Dr. Mantell. Such, however, may have arisen from two causes on the part of the Reviewer—the one, his ignorance from not going deeply and fully into the subject; the other, his omitting to weigh and consider all

722 WC: Corrected in a footnote to “No. 7, 1843.”

723 WC: *Trans. N.Z. Inst.*, vol. xii., p. 63.

matters in connection therewith: perhaps others might (in England) be assigned.

It is, however, given by the Reviewer as being necessary to his statement made in the body of his review, where he says, "All criticisms and misgivings as to the original audacious induction from the fragment of the supposed marrow-bone being thus quashed, *there remained only attempts at detraction from the merit of the discovery*. One of these amenities Mr. Owen has disposed of in a note to his third memoir, and *we shall devote a note to another.*" (*Loc. cit.*, p. 404.)

In order the better to take up and answer the charges made and implied in this long note, and as the book whence I extract it is both old and scarce here among us, and as the matter itself is purely, or mainly, a New Zealand one, I shall necessarily be obliged to quote it pretty largely:—

"Dr. Mantell, in a paper 'On the Fossil Remains of Birds collected in New Zealand by Mr. Walter Mantell' (*Quarterly Journal of the Geological Society* for August, 1848), says, 'I do not deem it necessary to enlarge on the question whether the *Dinornis* and *Palapteryx* still exist in New Zealand. On this point I would only remark that Mr. Colenso, who was the *first* observer that investigated the nature of the fossil remains with due care and the requisite scientific knowledge (having determined the struthious affinities of the birds to which the bones belonged, and pointed out their remarkable characters, ere any intelligence could have reached him of the result of Professor Owen's examination of the specimens transmitted to this country), has given in his masterly

paper before quoted very cogent reasons for the belief that none of the true moas exist, though it is probable the last of the race was exterminated by the early inhabitants of those islands.' The emphasis of the italics is Dr. Mantell's; the paper he cites is from the number of the *Annals and Magazine of Natural History* for August, 1844. In it Mr. Colenso refers to a visit which he made in the summer of 1838 to the tribes of the East Cape district, and to the stories which he heard from them.... So much for the journey in 1838. In December, 1839, Professor Owen despatched to New Zealand [470] copies of his first memoir, as printed in the Proceedings of the Zoological Society; and they were received before the close of 1840. Mr. Colenso's paper is dated the 1st May, 1842. 'In 1841-42,' proceeds Mr. Colenso, 'I again visited those parts.' He procured from the natives some bones declared by them to be true moa-bones. 'These bones, seven in number, were all imperfect, and comprised five femora and one tibia, and one which I have not been able satisfactorily to determine.... Leaving Waiapu, and proceeding by the coast towards the south, I arrived at Poverty Bay, where the Rev. W. Williams resided. This gentleman had had the good fortune to procure a nearly whole tibia of an immense bird, without, however, the entire processes of either end. Mr. Williams wishing to send this unique relic to Oxford, I left a pair of femora to accompany it, in order, if possible, to obtain from that seat of learning some light on these interesting remains.' ... Dr. Mantell, who takes no account of the influence of the dispersion of the first memoir in New Zealand between 1839 and 1841-42, seems only to be acquainted with Mr. Colenso's paper as

printed in the *Annals of Natural History* in 1844. We have been at the pains to look through the numbers of the *Tasmanian Journal*, and we find Mr. Colenso's account of his excursion in 1841–42, in vol. ii., No. 8, printed in 1844. From this it appears that Mr. Colenso embarked on the excursion which led to his *first* recognition of the remains of large birds in New Zealand on the 19th November, 1841—just two years after the publication of Owen's first memoir on the New Zealand struthious birds... The statement of these facts detracts nothing from the merit of Mr. Colenso's observations; but what becomes of Dr. Mantell's affirmation 'that Mr. Colenso was the *first* observer that investigated the nature of the fossil remains with due care and the requisite scientific knowledge?'?" (*L.c.*, pp. 404, 405.)

Here it is apparent that the Reviewer hits Dr. Mantell very hard; but I cannot see any real grounds for his so doing—rather, much to the contrary. No doubt, had Dr. Mantell wholly ignored, or slightly, or even slightly, mentioned Professor Owen's early discovery, the Reviewer would have had fair grounds for his heavy charges. But Dr. Mantell could not do that. And now, what did Dr. Mantell say? (I quote from *the very same paper* that the Reviewer had quoted from—*Quarterly Journal Geographical Society*, August, 1848.)

The doctor thus begins his very excellent paper "On the Fossil Remains of Birds collected in Various Parts of New Zealand by Mr. Walter Mantell, of Wellington." "It is not a little remarkable that one of the most interesting palæontological discoveries of our times—namely, the former existence of a race of colossal ostrich-like birds in

the islands of [471] New Zealand—though made in a British colony, and announced to the scientific world by an eminent British physiologist, has not hitherto been brought under the immediate notice of the Geological Society of London.... The first relic of this kind was made known to European naturalists by Professor Owen in 1839. It consisted of the shaft of a femur, or thighbone, but a few inches long, and with both its extremities wanting; and this fragment so much resembled in its general appearance the marrow-bone of an ox as actually to have been regarded as such by more than one eminent naturalist of this metropolis. And if I were required to select from the numerous and important deductions of palæontology the one which of all others presents the most striking and triumphant instance of the sagacious application of the principles of the correlation of organic structure enunciated by the illustrious Cuvier—the one that may be regarded as the *experimentum crucis* of the Cuvierian philosophy—I would unhesitatingly adduce the interpretation of this fragment of bone. I know not among all the marvels which palæontology has revealed to us a more brilliant example of successful philosophical induction—the felicitous prediction of genius enlightened by profound scientific knowledge. The specimen was put into Professor Owen's hands for examination, ... and from this mere fragment the Hunterian Professor arrived at the conclusion 'that there existed, and perhaps still exists, in those distant islands a race of struthious birds of larger and more colossal stature than the ostrich or any other known species.' ... In 1843 the correctness of these views was confirmed in every essential particular by a large collection of bones obtained by the Rev. W.

Williams, and transmitted to the Dean of Westminster; and still further corroborated by another interesting series brought to England in 1846 by Percy Earl, Esq., and by the collection which forms the immediate subject of this communication." (*L.c.*, p. 226.)

Surely this language is clear enough. Dr. Mantell, the Vice-President of the Geological Society, voluntarily and largely gives to Professor Owen the highest possible meed of scientific praise for *his being the first to announce* to the scientific world at Home his great discovery.

After this, Dr. Mantell goes fully into the large and rare collection of moa-bones he had then recently received from his son here in New Zealand, containing 900 specimens. And, in his doing so, he further says, "I will now describe in general terms the most interesting specimens in the collection formed by my son; the anatomical details, and the important physiological inferences resulting therefrom, will be laid before the Zoological Society by Professor Owen, to whom, as a tribute of respect due for his masterly interpretation of the bones previously [472] transmitted from New Zealand, I have offered the examination and description of every object in the series that he may consider worthy his attention." (*L.c.*, p. 231.)

Then Dr. Mantell takes up seriatim my paper on the moa, and quotes therefrom—not merely with reference to the few bones of the moa that I had obtained, but also the many and sundry other particulars I had brought forward relative to their places of deposit (geologically), their apparent age, whether the moa was still living or extinct,

researches, inquiries, traditions of the Maoris, &c.; and finally he says, "I do not deem it necessary," &c., as quoted in full above; which has caused the onslaught of the Reviewer.

Now, knowing, as I do, so much of the olden time—"fifty years ago"—in New Zealand, including the very, very few and isolated Europeans then resident who cared for scientific matters at all, and our seeking the moa's remains, I must again say that Dr. Mantell, in so writing, meant to say, and verily says, that I was "*the first*" person to do so out here at the Antipodes, and that this saying had nothing whatever to do with Professor Owen's masterly scientific deductions previously made in England, and already, very properly, prominently, and kindly, brought forward by Dr. Mantell in the beginning of the very same paper.

Indeed, I can hardly comprehend why the Reviewer should have so chosen to run his head bang against a post unless his eyes were shut; for (as I read them) Dr. Mantell had chosen several words in his sentence which would not so well apply to Professor Owen and his deductions from his *one* small and broken fragment—*e.g.*, "*first observer that investigated the nature of the fossil remains*" (*plural*) "with *due care*," &c.

And this is yet further and clearly shown in Dr. Mantell's words on the same subject in his work on "The Fossils of the British Museum" (published several years after, in 1851, and almost certainly before the Reviewer penned his aggression), in which the doctor says (writing on the moa), "The first European who appears to have taken cognisance of these facts, and paid attention to the native

traditions on the subject, was the Rev. W. Colenso,” &c. Then Dr. Mantell (again) goes on to say (“History of the Discovery”), “In November, 1839, British naturalists were first made acquainted with the discovery of bones of colossal ostrich-like birds in New Zealand, by the fragment of a thigh-bone of a bird much larger than that of the ostrich, which had been brought to England by a Mr. Rule, who lent the specimen to Professor Owen, by whom it was described in the *Zoological Transactions*.” (*L.c.*, pp. 93, 94.)

Moreover, Dr. Mantell says, “The first collection sent to England by my son, in 1847, consisted of nearly nine [473] hundred specimens. I gave Professor Owen the exclusive privilege of describing the specimens.” And then, in a footnote, Dr. Mantell adds, “The following is an extract from a letter now before me from Professor Owen, dated ‘Royal College of Surgeons, Christmas Day, 1847’: ‘I feel very sensibly the mark of kindness and confidence which you have given me in placing your son’s unique rarities in my hands for description; the more so as this liberal and generous conduct contrasts with that of others from whom I had expected better things.’” (*L.c.*, “Appendix,” p. 487.)

So that it appears the utmost kindness, disinterestedness, and liberality was existing and active between Dr. Mantell and Professor Owen—not only at that early time (and during a long subsequent period), but with especial reference to the discovery of the moa and of the moa-bones, when the Reviewer so diligently laboured to place Dr. Mantell’s conduct in the most malevolent light. And to call Dr. Mantell’s few simple and truthful remarks

“attempts at detraction from the merit of the discovery”!
Jam satis!

Before I leave this portion I would also observe, seeing so much stress is apparently laid by the Reviewer on my paper on the moa in the *Annals of Natural History* for 1844, as being the only one known to Dr. Mantell, that that very paper was kindly inserted in that serial by Professor Owen himself (who had received it from Sir W.J. Hooker, the Director of the Royal Botanic Gardens at Kew),⁷²⁴ who also subsequently favourably refers to it in his large work (*passim*),⁷²⁵ Moreover, I know not of any difference in that paper as published in England, and dated “May 1, 1842,” and the same published in the *Tasmanian Journal* in the previous year. And, further, the Reviewer takes care to tell us that my paper (“Account of my Excursion,” &c., in 1841–42, being mainly botanical) in the *Tasmanian Journal* was “printed in 1844;” but he omits to state what is given by the editor, within brackets, at the head of my paper—namely, “The following paper was transmitted by the author twelve months ago, but its publication in the *Tasmanian Journal* has been unavoidably postponed” (*l.c.*, p. 210). And, since the Reviewer also says, “We have been at the pains to look

724 WC: Sir W.J. Hooker thus mentions it in the *London Journal of Botany*: “We have lately received from Mr. Colenso a valuable monograph of several new ferns of New Zealand; and an admirable memoir on the fossil bones of a bird allied to the ostrich, which, together with the specimens of the bones themselves, I have placed in the hands of Professor Owen” (*loc. cit.*, vol. iii., p. 3, Jan. No., 1844).

725 WC: “Memoirs on the Extinct Wingless Birds of New Zealand,” vol. i., p. 115.

through the numbers of the *Tasmanian Journal*, and we find" (as above), why did he not notice what is prominently [474] stated at only two leaves before my paper on the moa — namely, "Government House, 17th May, 1843.—Present: Sir John Franklin, &c. Three communications had been received from Mr. Colenso, one of November 4th, 1842, with an amended copy of his paper on the moa" (*l.c.*, vol. ii., p. 77)?

Then the Reviewer goes on to say, in his note, "In December, 1839, Professor Owen despatched to New Zealand copies of his first memoir, as printed in the Proceedings of the Zoological Society, and they were received before the close of 1840. Mr. Colenso's paper is dated May 1, 1842.... Dr. Mantell, who takes no account of the influence of the dispersion of the first memoir in New Zealand between 1839 and 1841–42, seems only to be acquainted with Mr. Colenso's paper as printed in the *Annals of Natural History* in 1844." He had previously said in the body of his review, "Copies of the memoir were despatched forthwith to many residents in New Zealand, and special letters were addressed to the few personally known to Mr. Owen, strongly urging the prosecution of inquiries among the natives as to the existence of such fossil or semi-fossil remains" (*l.c.*, p. 402). Assuming, of course, that Professor Owen's *first* memoir had been received here in New Zealand, that it had been distributed, and that I had seen it, &c.—*ergo*, my paper!

The Reviewer does indeed say, "The statement of these facts detracts nothing from the merit of Mr. Colenso's observations;" but no other person, I suppose, reading

them could so think with him. On the contrary, if all that might be reasonably inferred therefrom was true, then, of course, my paper and myself should be dealt with accordingly.

Now, I positively affirm that I not only never saw Professor Owen's *first* memoir, but that I had never once heard of it, neither did I ever hear of any resident in New Zealand who had seen it. And it must not be overlooked that, residing as I was then in the Bay of Islands, in a part of New Zealand where no moa-remains had ever been found, and where the name was unknown, very far away from Cook Strait, the head-quarters of the New Zealand Land Company, and also distant from Auckland, the seat of Government, with only few and far-apart means of communication between our localities, and that only by small coasting-vessels, I was not in the way of receiving or hearing information of that kind.

But (apart from this negative statement) those assumptions and insinuations of the Reviewer are best answered by Professor Owen himself in his own words (please note particularly *dates*):—

“A fragment of bone was brought for sale to the College” [475] of Surgeons in 1839... Drawings of it, with my descriptions and conclusions, were submitted to the Zoological Society, London, November 12th, 1839.... There was some hesitation in the Publication Committee as to the admission of the paper, with the plate, into the Transactions.... Ultimately the admission of this paper into the Transactions, with one plate, was carried at the committee, the responsibility of the paper ‘resting exclusively with the author.’ On the publication of the

volume in 1838⁷²⁶ (*sic*) one hundred extra copies of the paper were struck off, and these I distributed to every quarter of the Islands of New Zealand where attention to such evidences was likely to be attracted. In this distribution I was efficiently aided by Colonel William Wakefield, at that period zealously carrying out in New Zealand the principles of colonisation advocated by his brother, Mr. Edward Gibbon Wakefield; by J.R. Gowen, Esq., a director of the then recently-established ‘New Zealand Company;’ by my friend Sir William Martin, the first Chief Justice; and by the Right Rev. Dr. Selwyn, the first Bishop of the Islands.” (“Memoirs on the Extinct Wingless Birds of New Zealand,” vol. i., pref., pp. iv., v.)

I copy again from Professor Owen’s large work:
 “*Addendum.*—J.R. Gowen, Esq., a director of the New Zealand Company, has obligingly forwarded to me the subjoined indication of a further discovery of the bones of the *Dinornis* from a new locality in New Zealand:
 Extract of a letter from Colonel William Wakefield to J.R. Gowen, Esq., dated Wellington, *19th September, 1843.*—*‘I received lately your letter respecting the moa, with Professor Owen’s notice.* I have taken steps to procure some of the bones, which are much larger than the one represented in the sketch.””

This, I think, sufficiently answers the Reviewer’s hasty conclusion as to “the influence of the dispersion of the *first* memoir in New Zealand between 1839 and 1841—

726 WC: This is an error: it may be 1839, but is more likely (considering the former date mentioned by Professor Owen, and what followed—including “the publication of the volume” of 1839) to be 1840.

42"—that is, as far as what had been made known and done throughout that period by the New Zealand Land Company.

The Chief Justice, Sir William Martin, arrived in New Zealand by the ship "Tyne," in 1841. His residence was at Auckland; and I have good reason for believing that both he and the officers of the Land Company had vastly too much of higher and more important public matters to attend to. The Bishop of New Zealand, with the Rev. W.C. Cotton, did not arrive in New Zealand until June, 1842, after my paper on the moa was written. [476]

Professor Owen also says the replies to his letters, &c., "anxiously expected through the years 1840, 1841, and 1842, at length arrived, in the letter from Rev. William Cotton, in that from Colonel Wakefield" (*supra*). "and in the collection of bones transmitted by the Rev. W. Williams, and received in 1843 by the Rev. Dr. Buckland at Oxford" (*l.c.*, p.v.). And, again, "The first letter received by me from New Zealand, confirming this announcement, and acquainting me with the existence of the specimens" (above mentioned), "was written by my friend the Rev. William Cotton, M.A., 10th January, 1843" (*l.c.*, p. 74).

Dr. Dieffenbach, the naturalist attached to the New Zealand Land Company, who was in New Zealand during the years 1839, 1840, and 1841, certainly never heard while here of Professor Owen's *first* memoir. During his last year in New Zealand he lodged in a house very near mine at Paihia, and we often conversed on the moa and on kindred matters.

In 1842 Dr. Sinclair (afterwards Colonial Secretary) lodged at that same house, and with him I was also well acquainted; and I am pretty sure that Dr. Sinclair during that time had not seen Professor Owen's *first* memoir. And so, I think, I may say of Sir J.D. Hooker and the other officers of the discovery-ships "Erebus" and "Terror," which wintered there in the Bay of Islands in that same year—that they had not then seen a copy of it while in New Zealand.

Also, the Rev. W. Williams I may mention here, drawing my inferences from his communications with me while staying several days at his house, and from his letters to me; and more particularly from his long and interesting letter to the Rev. Dr. Buckland which accompanied the collection of bones (*supra*), in which letter Mr. Williams is not only wholly silent respecting Professor Owen and his "first memoir," but says, "If the bones are found to be of sufficient interest, I leave it to your judgment to make what use of them you think proper; but if the duplicates reach you, perhaps one set may with propriety be deposited in our museum at Oxford." And Mr. Williams concludes his letter with these words: "Should I obtain anything more perfect, you will not fail to hear from me; and, in the meantime, may I request the favour of your opinion on these bones, and also *the information whether any others of similar character have been found elsewhere?*" (L.c. pp. 75, 76.) This letter is given *in extenso* by Professor Owen, and is dated "Feb. 28th, 1842."

I may here briefly remark that I was not a little surprised to find that the Rev. W. Williams had not specially

mentioned in his interesting letter to Dr. Buckland the pair of femora [477] I had left with him for Oxford;⁷²⁷ seeing too that I had recently brought them from the East Cape, sixty miles further north and in a different geological country.

Moreover, I may here fairly quote from Professor Owen's *first* letter to me, as affording an additional gleam of light on my present inquiry. It is a long letter, a large portion of it being occupied with the *Apteryx*: "Royal College of Surgeons, Lincoln's Inn Fields, London, 23rd October, 1843.—Sir,—I am encouraged by Sir William Hooker to hope that you may interest yourself in transmitting me information and specimens relative to a point in natural history which I have been for some years endeavouring to elucidate—viz., the nature and affinities of the gigantic bird which appears to have become extinct, like the dodo of the Mauritius, within the historical period in the North Island of New Zealand. The Proceedings of the Zoological Society for January, 1843, which I take the liberty to transmit, will put you in possession of the amount of information which I had obtained on the subject of the *Dinornis* at that period." And, at the close, "As soon as I have published the memoir I am now preparing on the *Dinornis*, I shall forward it to the Rev. W. Williams and to yourself."

That letter, sent through some private hand, only reached me on the "17th January, 1846"!⁷²⁸ I never received the

727 WC: Mentioned above, p. 470.

728 WC: As per my indorsement thereon. Here is, also, a kind of confirmation of what I have stated above, at p. 474.

Proceedings of the Zoological Society therein mentioned; but I did subsequently receive from Professor Owen a copy of his paper, "On *Dinornis* (Part II.). Read June 26, 1846;" which is also contained in his larger work above quoted, vol. i., pp. 115–137.

In conclusion, I confess to a feeling of disappointment at my never having seen Professor Owen's *first* paper, with the drawings of the first fragment of bone of *Dinornis* that had been taken to England; which disappointment was increased on my finding that such were not contained in his large work on "The Extinct Wingless Birds of New Zealand." An "abstract," however, of that paper is given by him in the "Introduction" to his "Memoir on the *Dinornis*," in that work (*l.c.*, pp. 73, 74).

The review is headed "Progress of Comparative Anatomy," and includes fifteen of Professor Owen's works, from 1830 to 1849;⁷²⁹ it extends over fifty pages of the [478] *Quarterly*, from p. 362 to p. 413, containing many lengthy extracts, and is certainly a very ably written one. Indeed, a thought (or something more fixed and stable) has occurred to me that the reviewer of those able works, who wrote the body of the said review, did not write the long note at pp. 404, 405, the tenor, tone, and language are so very different, so discourteous, so largely exceptional, so far from truth!

729 WC: Omitting many special memoirs and monographs. The chief of them, however, are enumerated in another very long footnote in two pages, 370 and 371.

1892 Bush jottings: No. 2 (Botanical).

Transactions of the New Zealand Institute 25: 307-319.

[*Read before the Hawke's Bay Philosophical Institute,
12th September, 1892.*]

The harvest of a quiet eye.

That broods and sleeps on his own heart.

WORDSWORTH.

HAVING been called on by our Honorary Secretary to furnish a paper (or a "forfeit"⁷³⁰) for our branch Institute for this session of 1892, and having again spent a large portion of this year in this high inland wooded district (commonly called "the bush"), I think I cannot do better than to jot down a few of the more interesting botanical sights I have witnessed with more or less of delight, especially when considered in connection with the many pleasurable feelings they evoked. And these I would divide into three groups,—

I. Curious, scarce, and unique.

II. Peculiar and pleasing.

III. Striking, though common.

I. CURIOUS, SCARCE, AND UNIQUE.

1. And first of a fern, *Polypodium pennigerum*, Forst.

While walking in a wood near Dannevirke, I was

730 WC: This refers to a sentence in my Presidential Address of 1888—viz., "that every member should contribute annually at least one original paper, or five good specimens to the Museum, or two suitable books to the Library" (p. 19).

suddenly surprised on noticing a tall subarborescent fern of this species; its main caudex or stem was about 12 in. high, rather slender, with six regular branch-stems (one of them being forked) issuing from around it, each about 1 ft. long, and all upright, presenting a neat candelabrum-like appearance. Unfortunately the upper leafy portions of their fronds had been either cut off or eaten by cattle, leaving only their stems (stipites). These, with the branches and upper part of the main stem, were all lately dead, but the plant was springing vigorously afresh from near its base. Very likely, had the plant been uninjured and flourishing, with its large and numerous leafy and drooping fronds (in its usual state), I should not have seen its peculiar manner of growth, as it grew in a flat part of the forest. I had not unfrequently noticed this fern, when growing undisturbed on low alluvial ground by the sides of streams, to possess a short coalescent trunk of a foot or more long, but never before saw one branched; and so I thought it worthy of being recorded. [308]

2. Of an orchid, *Gastrodia leucopetala*, Col. In another part of the same wood I was much pleased on finding no less than eleven specimens of this (now rare) terrestrial orchid, all growing together within a small semi-enclosed spot of about 2 ft. in diameter; and just beyond were two more. This was at the end of January, and of course they were all past flowering, as this curious plant flowers about Christmas; their upright reed-like stems were nearly alike in size, each being about 2½ ft. high, and full-flowered. The eleven specimens were growing close to the base of a large living rimu tree (*Dacrydium cupressinum*), and nearly surrounded by its high and naked roots, projecting like ridges from its trunk, which

no doubt had been the means of preserving the roots of these plants, which are tolerably large and fleshy, and are edible both by man (the old Maoris) and pigs. In fact, I have long been of opinion that the main cause of this orchid now being so rarely met with in its forest habitat is owing to its root being eagerly sought after and eaten by the wild pigs. For a full description of this fine species see Transactions N.Z. Institute, vol. xviii., p. 268. I may further remark that those specimens there described were also obtained from another part of this same wood.

While mentioning a species of the order *Orchideæ*, I may further observe that several of the indigenous epiphytal ones are well represented in the forests here—viz., *Dendrobium lessonii*, Col.; *Earina autumnalis*, Hook.; *E. mucronata*, Lindl.; *E. quadrilobata*, Col.; *E. alba*, Col.; also, but more sparingly, that curious and rare one *Sarcochilus breviscapa*, Col.: all these usually grow high up on the larger timber-trees, in the forks of their main upper branches, which makes it to be so difficult to get good specimens of them; but now that those trees are being felled for timber, specimens of those orchids are more easily obtainable.

These plants certainly add largely to the beauty of our New Zealand forests in their flowering-season, about midsummer, when gracefully pendent producing their numerous flowers at the tips of their long lithe branchlets swinging in the wind. Indeed, the curiously-marked long woody polished ringed stems of the *Dendrobium* are a pleasant object of contemplation and study, as such are sure to remind the beholder of the regularly-ringed and shining stems of the malacca and other walking-canes.

3. A fungus, *Ileodictyon cibarium*, Tulasne, var.

giganteum, Col. Of this highly-curious fungus I have met with a remarkable fine specimen, which I have (for the present) termed a *variety*, but which may prove to be another species of that strange and singular genus. It is not only twice or three times the size of the largest I have ever yet seen, but it [309] has other peculiarities.

Unfortunately, the description of *I. cibarium* in Hooker's "Flora of New Zealand" is very insufficient. This species is pure-white, of an oblong shape, somewhat resembling that of a large inflated bladder of open network, being 14 in. long and 9 in. wide, possessing twenty-two large pentangular irregular-size meshes, the largest being about 4 in. by 2 in.; their ribs very wide, 6–8 lines, and much corrugated and pitted, with peculiar triangular holes in the middle of the rib at each outer angle: its volva, originally before bursting about the size of a pigeon's egg, is thickish, gelatinous, and strongly marked internally with white cross-lines corresponding with the more prominent net-like ribs of the pileus when closely compressed within.

But its curious history has yet to be told. It was late in the autumn (May), when I was in a grassy spot on the confines of a small retired wood (whither I had often been in former years), when on seating myself on a dead prostrate tree I noticed two or three common specimens of *I. cibarium* showing themselves among the low herbage; I collected them. On looking more closely I saw an olive-coloured egg-shaped fungoid substance peering up from the ground underneath a thick branch of the tree on which I was sitting, apparently as if it were pressed down by the branch. I broke the branch off carefully,

when the egg-like substance rapidly burst open, and up sprang this fine specimen as if forcibly ejected by a spring, unfolding itself immediately to its full size. Its sudden and unexpected movement startled me; but after admiring this wondrous production of Nature, and its astonishing internal powers,—seeing, too, it was but a weak and flimsy tender substance without nerves,—I brought it carefully away in my handkerchief, and, after washing it with a feather in repeated waters (to remove its copious brownish slime of a most disagreeable odour, which is common to them all, including the closely-allied and handsome genus *Aseroe*), I dried it, and its volva or case, as a good specimen.

In former years (in the forties), before the introduction of cattle, specimens of *I. cibarium* were not unfrequently to be met with in open fern-lands, and generally fully expanded, usually from 3 in. to 4 in. diameter, and nearly globular; but I never before witnessed the bursting of a volva. The apparent strength, or power, shown by this small, soft, and tender fungus reminded me strongly of what we have read as recorded of some of the mushroom-like genus (*Agaricus*) in their displacing and forcing up the flat stones in city pavements.

As before stated by me in former papers read here, these fungi while in their young, unbroken egg-like condition were formerly eaten by the Maoris; in that state they have none of that offensive ill-odour that pertains only to the fully-expanded [310] pileus, and which is confined to the thick brownish slime with which it is covered: the difference is just that between a fresh-laid and an addled egg.

4. *Gentiana montana*, Forst. Another plant which I think should be included in this group as being both very rare and strange in this low wooded district is a species of *Gentiana*, and, as I believe, *G. montana*.

The natural home of this pretty little flowering-plant is on the open grassy tops of the neighbouring high Ruahine mountain-range, where it embellishes the small herbage of its sub-alpine locality with its numerous pale and neat flowers, which are large for such a small plant. I have only met with it in *one* small open spot on Tahoraiti Plain, where several plants of it grew; but I do not think it is to be found anywhere else in all the lower and wooded grounds. My detecting it there very much surprised me; indeed, as it was so long back since I last saw it growing on the mountains (in 1852), at first sight I supposed it to be a new species. Now, seeing that the seeds of the *Gentiana* are neither minute nor light (feathery), the question arises, How should it be found here on the plains so far away from its natural mountain-home?

5. Another fern, *Lomaria elongata*, Blume (*L. colensoi*, Hook.; *L. heterophylla*, Col.). The same reason which led me to bring forward the preceding plant causes me also to note here this fine and peculiar fern. Its original habitat, where I first detected it (in 1842), was on the banks of a brawling mountain-stream in the deep forests in the interior to the north-west of Lake Waikare, in the celebrated Urewera country, where, on those alluvial flats, it formed large and continuous strange-looking beds, through which it was difficult to force one's way, there being no path or track: this, however, was partly owing to the small driftwood and trees carried thither by

heavy floods being concealed among its thickly-growing large fronds, so that one stumbled at every step, often getting ugly and painful knocks on one's shins. And here I may remark that, in travelling in those early times, and always on foot, in those places along the sides of streams in the wooded interior, the plan was to cross and recross the stream continually to the more open bank, there being no track whatever, the only guide for direction of one's course being the stream itself.

Here, however, in this Hawke's Bay bush district, I only know of one small isolated spot on the side of a mountain streamlet where it is found, and it grows there luxuriantly. I have never before met with it save in the interior. A few years ago, however, a settler at Woodville (an old Hawke's Bay resident), in clearing his section of land, found this fern there growing, and, being much surprised on seeing it, from its [311] novelty and size, and thinking it was new, sent me a specimen. It is a very striking fern, both from its large size and its strange appearance, and its equally curious manner of growth or disparity of form; and that not merely from its great difference in the barren and the fertile fronds (as obtains in other species of the *Lomaria* genus), but in its barren fronds, for, while its large fronds are usually very broad and coarsely pinnatifid, some of them are merely narrow, oblong, and simple (in this diform respect not unlike large specimens of *Polypodium billardieri*).

For my part, having given this fern much study, I am not inclined to believe it to be identical with *L. elongata*, Blume (a Javanese and Indian fern), as that species is largely drawn and fully described by Beddome in his

“Ferns of Southern India.” Sir W.J. Hooker, on my sending him specimens of this New Zealand fern, and finding I had published it with a description in the “Tasmanian Journal of Natural Science,” in 1844, as *L. heterophylla*, immediately republished it with good drawings in his “Icones Plantarum,” naming it *L. colensoi*, there being already a *L. heterophylla* described at Home, but unknown to me here in New Zealand.

II. PECULIAR AND PLEASING.

In this group I would place a few of our local ferns and some other plants, but only such as are not commonly met with, and, when found growing in undisturbed spots, serve to entrance the beholder, rivet his attention, and fill him with admiration—that is, if he possesses an eye to see, and a mind to understand. I will begin with that newly-detected neat little maidenhair, *Adiantum polymorphum*, Col.,⁷³¹ which, since I first made its acquaintance in 1887, I have found in three different secluded spots in these umbrageous forests, and in each place forming small continuous and closely-growing beds, flourishing beautifully, and presenting a delightful appearance, from their elegant form, graceful drooping habit, and uniformity of colour and of cutting, which is further increased on gathering a specimen and noticing more closely its slender glossy ebon stems.

Two other species of this genus—*A. hispidulum*, Sw., and *A. fulvum*, Raoul—I have also noticed in forests at the North (Bay of Islands), possessing a similar habit,

731 WC: Trans. N.Z. Inst., vol. xx., p. 215.

growing closely in beds forming large patches, like this species; but those are much larger and coarser ferns, though fine specimens of *A. hispidulum* are very handsome.

Here I will briefly mention another newly-discovered and very fine fern (some specimens are truly beautiful), [312] *Pteris (Litobrochia) pendula*, Col.,⁷³² and this I also notice because I have detected it in two other localities in this neighbourhood, but, as before (originally), hanging thickly down from shaded cliffy spots, sides of streamlets difficult of access. Some of the plants were very fine, of most luxurious growth, and looking tempting, so healthy and charming.

In three dry spots in particular, far apart from each other, in the deep forests between Dannevirke and the River Manawatu, I have often gazed with delight on thick-growing patches or beds of that extremely neat and graceful tender fern *Asplenium flabellifolium*, Cav., one of the most elegant of its genus. This wood variety (as I deem it) has much smaller pinnae than this fern commonly has when growing in open places, and they are more finely and sharply cut, and its narrow linear fronds, being also much longer, give it a still more graceful appearance; its colour, too, is that of a most refreshing light emerald-green. All this, however, may naturally arise from its moist shady home in the forests. It forms compact and healthy beds by overlying itself considerably (*stratum super stratum*), the long and delicate fronds emitting at their extreme circinate tips

732 WC: Trans. N.Z. Inst., vol. xx., p. 218.

minute rootlets, which adhere to the soil when they touch it, when they again send out fresh stems, and so form new plants. This fern, however, is well known among us, and that deservedly, from its beauty as a living fern-decoration when suspended in a light wire basket, as well as from its being so easy of culture; and therefore I should not care to mention it here were it not that it is rapidly becoming very scarce, and those three spots in the dry and ancient woods were so exceedingly lovely that they have left their natural and truthful images deeply impressed on my mind; so true it is, "A thing of beauty is a joy for ever."

Having briefly noticed some of our smaller handsome local and rarer ferns, I will now say a few words respecting the bigger ones—the giants of the fern order—although many of them are generally very commonly distributed throughout the colony, and more particularly in the wooded districts.

Come on then, my hearers! Come with me into a secluded calm and quiet dell, in a deep-shaded forest, far away from the haunts of man! Let us go to a sacred spot well known to me, and still remaining free from the incursions of the ruthless invader, both quadruped and biped! May such concealment long continue!

Here, at the level bottom of this dell, down whose stony sides we have been scrambling, through which a small purling streamlet of clear water winds its tortuous way, stand a [313] group of majestic-looking tree-ferns, species of *Dicksonia*; they are about, say, 20 ft.—25 ft. high, and stand pretty far apart from each other, so that one can walk easily between them, and sit down, if so

disposed, on the low and soft grassy herbage at their bases. Above, at top, their perennial crowns of large spreading green fronds extend, meeting and crossing each other—some horizontally, some gracefully drooping—while their stout upright stems are thickly clothed with their own dead and grey-brown fronds, hanging closely and not ungracefully down, wrapping them, as it were, in tolerably regular rows or layers from the base to the top, as if to protect their trunks, or even to keep them warm. Those dead hanging fronds are from their natural and regular yearly decay, and evidently not a single frond has ever fallen off or been displaced. They greatly add to the solemn and still beauty of the scene. If gently lifted their clean stems will be seen in all their rich brown colour and fibrous comeliness, without any small ferns, mosses, or other plants growing on them.

Such a spectacle, when undisturbed and deeply embowered and surrounded by ancient timber-trees,—

Those green-robed senators of mighty woods,
Tall oaks, branch-charmed by the earnest stars,
Dream, and so dream all night without a stir.

KEATS, "Hyperion."

—is to me a most pleasing one, causing me to behold it with bated breath, with a kind of feeling approaching to sentimental awe, better felt than expressed in those deep secluded forests—such a feeling as one might reasonably suppose would arise within the bosom of the wary and discreet visitor to the ancient oracle of Apollo at Delphos three thousand years ago. In such a place, and with such feelings in this retired solitude in the grand temple of Nature, the suitable words of Bishop Heber, so

descriptive of “majestic silence,” are likely to be vividly recalled to mind,—

No hammers fell, no ponderous axes rung;
Like some tall palm the mystic fabric sprung.
Majestic silence!

HEBER, “Palestine.”⁷³³

But there is yet another and a very different sight to be seen and admired among my groups of big living tree-ferns—[314] one sure to evoke feelings of an opposite character in the bosom of the beholder, for, if the former were of the “Pensero” class, these would as surely pertain to the converse or the “Allegro” one.

Here, then, in another umbrageous solitude, is a similar lot or small natural secluded grove of tall tree-ferns, generally of the genus *Cyathea*; but their stout stems are entirely without that solemn-looking dead grey-brown wrapping, and, instead, they possess a most beautiful and elegant closely-compacted light-green and glossy dress, composed of very small living creeping ferns, pendulous and thickly imbricated like tiles on the roof of a house, often delightfully glistening when visited by a passing ray of sunshine. These small ferns are mostly composed of two species only—*Trichomanes venosum*, Br., and

733 WC: This quotation from Bishop Heber’s poem was altered in later editions to—

No workman steel, no ponderous axes rung,
Like some tall palm the noiseless fabric sprung.
Silently as a dream the fabric rose,
No sound of hammer or of saw was there.

[Footnote] I may here observe that these two last lines are also in Cowper’s “Task,” the Winter Morning Walk, book v.

Hymenophyllum flabellatum, Labill.—and they do dwell together apparently in the most pleasing harmony, as if enjoying life. They often completely enwrap the whole large and tall trunk of the tree-fern from base to apex, all green and flourishing, without showing the smallest spot of intervening open space, evidently the perennial and steady growth of many years. These little ferns are something more than of epiphytal development, pertaining rather to that of quasi-parasitical, for their creeping rhizomes and roots penetrate deeply into or among the outer dead matted stipites and fibres of the tree-ferns on which they flourish.

Perhaps I had better end here respecting the tree-ferns. But then you, my audience, “dwellers at home at ease,” would only know half,—and that of my woodland joys: so it is but fair you should also know a little of my *sorrows*, otherwise you would remain in happy ignorance of them. These, however, I shall only briefly touch on, owing to the extreme disagreeableness of the theme.

And first of my majestic venerable-looking group. On my return on one occasion to one of those dear old haunts, I found, to my horror, that some Goth or churl had recently been there, and had set fire, separately, to each one of those eight or ten big tree-ferns! just to burn off their thick dry wrappings, the undisturbed growth of many years, and so to make a blaze; and there their blackened and half-charred stems stood, with their once lovely elastic crowns of fronds sadly scorched and stiffened above them—a piteous sight! I could fancy they even reproved me, and I could have wept.

I had long had good reasons for believing that my visits to that unfrequented part of that old forest, so difficult of access, were watched by one or more of the underlings or stockmen of the neighbouring sheep-station, who, I suppose, on his going thither after me, and not discovering what it was that could have induced me so frequently to visit that place (for the old [315] belief was that in such spots I was fossicking for gold), vented his disappointment in that way—by striking a match or matches and setting fire to those tree-ferns out of mere wantonness. Several such instances had occurred in former years during my sojournings at Norsewood, some of them having been caused by so-called “picnic” parties, and some by *teetotallers*—judging from the labels on the bottles left behind!

Before, however, that I quit this pre-eminently pleasing and loved subject of our New Zealand ferns, I would call your attention, and especially that of the young-lady portion of my audience, to an interesting, novel, and elegant sight I have several times seen and admired while residing in the bush; this, too, being an artificial and neat method of preserving them. To me, indeed, it was unique, never having before noticed anything of the kind.

A bunch or small bundle (I might almost term it a *bouquet-de-plumes*) of an assorted few of our larger ferns—viz., *Polypodium pennigerum*, *Lomuria fluviatilis*, *Asplenium lucidum*, *Adiantum cunninghamii* (the handsome species of maidenhair), *Hymenophyllum dilatatum* and *H. demissum*, and *Pteris (Litobrochia) pendula* (my new fern)—were loosely bound together much after the fashion of a sheaf of wheat, with the tips

of the longer specimens gracefully drooping, and placed so as to stand erect on a black stand under a tall cylindrical glass with closed dome-shaped top. These were all perfect, pure-white—dead or frosted white like silver or tissue-paper, with every tiny leaflet fully expanded, and with the veins and seed-receptacles and capsules clearly and beautifully shown. The leaves, moreover, of some of them are thickish and obscure in their living state (as of *Asplenium lucidum*), but now they were equally thin and semi-transparent like those of the others.

I saw this elegant and peculiar specimen of art-decoration—so chaste and simple and yet so strikingly lovely—at the Club Hotel, in Woodville, in the larger parlour upstairs; I often admired it. There it stood, conspicuous among other ornaments, on the top of a high dark-coloured piano. I do not know how the remarkable change, which seems to be permanent, was effected; I made inquiries of the proprietor, but he being newly entered did not know. I am aware that very great alteration can be caused by bleaching vegetable fabrics with the fumes of burning sulphur, and this may have been so effected. Be that as it may, it seemed to me to be a new and easy mode of admirably and more completely displaying the hidden natural beauties of our lovely New Zealand ferns, and so I bring it to your notice.

One other little-known plant must, not be omitted from [316] this list—namely, *Metrosideros tenuifolia*, Col.,⁷³⁴ and this from its very peculiar manner of growth, its

734 WC: Trans. N.Z. Inst., vol. xxiv., p. 387.

pleasing colour, and its strange homes. I only first detected this plant about a year ago, and then (like many others) it was confined to one spot, where, however, it grew abundantly. Since then I have noticed it growing in several places, but all similar—that is, on the sides of steep cliffs, all the better if somewhat concave. In such spots it revels, repeatedly overrunning itself, flourishing luxuriantly. It adheres very closely to the soil, like small-leaved ivy, in England, to trees. The great regularity of its little round and glossy leaves, and its numerous slender red branchlets, afford a charming picture. What an elegant plant for rock-work, and for a permanent stone or clay alcove or bower! But words fail to describe this lowly-living ever-green beauty.

There are yet some other peculiar plants, which, though small singly in themselves, and of no striking beauty to arrest the eye of the beholder, should not be overlooked, as they often impart, from their curious appearance and situation on the dead and dry overhanging branches of trees, additional solemnity to the shaded and secluded woodland scenery.

Of these are some of our larger and foliaceous tree-lichens, such as several species of the genus *Sticta*, viz.: *S. fossulata*, Dufour; *S. freycinetii*, Delise; *S. argyracea* and *S. carpologoma*, Delise; and *Usnea barbata*, Fries (“old-man’s beard”), several varieties.

It is well known that lichens live to a very great age; they retain their vegetative and productive powers uninjured throughout the hottest and driest seasons on the highest and most exposed dead branches: although, on gathering them at such times, they crumble to fine powder in the

act, yet, on their becoming wetted from rain or dew, they are soft and flaccid, and may be folded up without breakage or injury.

I have seen very large specimens of the above-mentioned lichens, some specimens of the *Usnea* (fitly termed “old-man’s beard,” being thread-like, bushy, and pendent), 1 ft.–2 ft. long; and some specimens of *Sticta* extending from 1 ft. to 18 in. in diameter, and very fully and complexedly branched, their branches flat and bearing much fruit, which is often curiously and regularly placed like little shields or saucers on their margins.

They are all very numerous, and grow to perfection in damp gullies, especially on overhanging trees and shrubs in their sides in sheltered declivities; and often, when they are of a large size, and sombre lurid leathery appearance, hanging from the bare and dead branches, they give an uncanny, [317] weird-like aspect to the solitary scene. At such times, pictures from Goethe’s “Faust”—particularly of Faustus and Mephistopheles ascending through the dry mountain-woods to the witches meeting on the Brocken—have been forcibly called to my mind, and I have thought how such pictures might be further improved by the addition of some of those large, flapping, strange-looking lichens to the naked and dead branches of those gnarled mountain-trees, even more so than by the artist’s introduction of flitting bats into such a scene, as bats do not fly by night.

Furthermore, in those dry and stony hill-sides, when the soughing winds sweep fitfully over the arid barren plains around and above, and blow among the stiff and hardened thin-edged lichens hanging from their denuded

branches, not unfrequently sharpish, shrilly, stridulous, and low wailing sounds are heard, which are not, however, unpleasant, and serve to increase one's strange thoughts and mournful feelings, especially if alone—much as Wordsworth has it,—

In that sweet mood when pleasant thoughts
Bring sad thoughts to the mind.

III. STRIKING, THOUGH COMMON.

A few plants that are very frequent on the sides of the railway-line between Dannevirke and Woodville, and almost sure to arrest the eyes of some of the passengers, from the oddness and singularity of their appearance, may here be briefly mentioned, and that because very often certain questions are sure to be asked concerning them, especially at this, the winter-*cum*-spring season of the year.

And first I would take two that are often seen growing together close to the railway-lines, upright, single-stemmed, and pretty nearly of the same height (3 ft.—6 ft. or so), one a small young tree-fern (probably a *Dicksonia* or a *Cyathea*), and the other a young “cabbage-tree” of the settlers (*Cordyline australis*). These, with all the herbage and small ever-green shrubs that grow thickly around them, have been lately set on fire (I suppose, to clear the sides of the railway-line); and while the herbage and shrubs have been thus destroyed—burnt up—these two plants are still living, and fast shooting their large bright-green leaves and fronds from their tips and so forming living crowns, while their stems present a

hideous black appearance, as if not only scorched but thoroughly burnt and killed, the whole of their bark and outer woody layers having been destroyed; increased, if possible, by the great contrast in colours, shown in their long dry and pale faded leaves hanging irregularly down from their tops; these leaves having been scorched and killed by the fire, but being thick and green were not completely burnt up. And the question [318] is almost sure to arise from some one observant person in the carriage, "Why is it so? Why are these two plants alone so salamander-like as to live through the terrible ordeal of raging fire?" And mark, this inquiry arises from only *one*, who may be laughed at for it by the company—the many,

With the loud laugh that spoke the vacant mind.

For to the many there is nothing to be seen, nothing to be noticed, nothing worthy of observation in the whole scenery through which we are passing on both sides, whether botanical in charming variety and profusion, or geological as revealed by the varied horizontal strata in the sides of the deep cuttings through which we frequently thread our way. Such unobservant travellers and tourists too often remind one of Wordsworth's "Peter Bell":—

A primrose by a river's brim
A yellow primrose was to him,
And it was nothing more.

Of course, the answer to that question is an easy one, though the cause may not be known to all: these two plants belong to the endogenous class, whose living woody system is internal and central, and not on the

outside, under the external bark, like those others of the exogenous class around, that have at the same time been burnt and so perished. Large tree-ferns 20 ft. to 25 ft. high are frequently to be seen on the edge of or a little way within a burnt forest—that is, their blackened burnt stems standing like charred and sooty pillars, while from their tops large crowns of young bright-green fronds are springing and spreading, and so presenting a curious and strange contrast. At the same time, not a single tree or shrub of that forest has escaped the ravages of the fire; all besides is dreary desolation, vegetable death.

There is yet another plant that is very common in the woods near the railway-lines which, from the great singularity of its appearance, deserves notice. It grows only on the upper large branches of trees, where it forms round ragged bunches of rather long grass or leek-like leaves, and sometimes several of such bunches are together, forming quite a big mass. It shows itself more conspicuously and strangely when growing on dead burnt and still standing trees, which is very frequently the case, and has often astonished me from its tenacity of life. How those small and feeble and exposed plants escaped the fiery doom which destroyed the big and stout trees root and branch on which they are still living and flourishing is a mystery to me. Further, the bark of many of those burnt trees has peeled off, leaving only their pale, bleached, denuded limbs, on which those plants still adhere [319] and grow and live, which serves to make their appearance the more singular.

This plant is a species of *Astelia*, and probably *A. spicata*, Col.,⁷³⁵ which species, as far as I know, is confined to this wooded district. There are several species of this genus known to inhabit New Zealand, and some of them are of a very large size, especially in the northern woods, where, high up in the lofty trees, they resemble huge crows' nests.

And now, my audience, I have done. Believe me,—

There is a pleasure in the pathless woods;
There is a rapture on the lonely shore;
There is society where none intrudes,
By the deep Sea, and music in its roar:
I love not Man the less, but Nature more.

BYRON, "Childe Harold."

735 WC: Trans. N.Z. Inst., vol. xiv., p. 335, for m., and vol. xv., p. 340, for f. plant.

1892 Cryptogams: A Description of a few Lately-discovered Rare Indigenous Ferns; also, Notice of a Fine and Peculiar Fungus, Illeodictyon, Tulasne, = Clathrus, Cooke.
Transactions of the New Zealand Institute 25: 319-324.

[Read before the Hawke's Bay Philosophical Institute, 28th November, 1892.]

Order I. FILICES.

Genus 11.⁷³⁶ *Adiantum*, Linn.

1. *A. pullum*,⁷³⁷ sp. nov.

Rhizome as stout as a goose-quill, creeping, densely hairy and scaly; hairs reddish-black; scales black, large, acuminate, glossy. Plant 6 in.-8 in. (sometimes 10 in.-11 in.) high, suberect and drooping, ovate and subpedate; several fronds springing close together from rhizome, 6-8 within 1 in.; stipes (and rhachises) very slender, almost filiform, black, glossy, mostly curved or irregular not straight, 4 in.-5 in. long, rarely 6 in.-7 in., channelled on upper surface, slightly scaly below and semi-muricatulate; frond 3 in.-4 in. (sometimes 5 in.-5½ in.) long, always more or less dark-coloured on both [320] surfaces, some pinnae are nearly black, glaucescent below, usually bipinnate and tripinnate, generally 3 sometimes 4 rarely 5-6 branches long curved pinnate;

736 WC: The numbers attached to orders and genera are those of them in "Handbook of the Flora of New Zealand."

737 *Adiantum cunninghamii* Hook.

pinnules alternate, rather distant, patent on long filiform petioles, mostly small, of various shapes and sizes on the same plant, broadly cuneate, parallelogrammiform, roundish-oblong, suborbicular and subrhomboid, 2–3 lines long rarely 4–5, gradually decreasing in size to tips, the upper pinnules close and very small, the ultimate one rhomboidal obtuse; the lower margin (or sometimes 2 margins) being the continuation of petiole always thickened straight even glossy and coloured; the upper margins cartilaginous laciniate and serrate, teeth large white hard and sharp; veins numerous, close, free, much dichotomously and flabellately branched, several pairs rising and spreading from a single basal vein, and all subradiating from the petiole or lower basal angle. Sori few but of a large size and very prominent far beyond margin of involucre, on the lobules and not in the notches of the pinnules. Involucres brown shining (black in age), rather large, their margins gaping elevated, generally 5–7, sometimes 9, on the larger pinnules, on the upper margin and partly extending round the outer or tip; smaller and very close together on the small, and only 1, 2, or 3 on the smallest pinnules; sinus deep; when young, however, they are very thin white and crisp, or crumpled.

Hab. Open land, damp shaded spots rocky places, between Dannevirke and the East Coast, County of Waipawa; 1892: *Mr. H. Hill.*

Obs. I. This fern has given me much extra labour, from its possessing some of the common characters of *A. cunninghamii*, Hook. (*A. affine* of some modern writers on ferns; but *quæ.*), and of other allied species (particularly *A. heterophyllum*, Col., Trans. N.Z. Inst.,

vol. xx., p. 218); but (as I fortunately possess a large number of specimens of all sizes, through the liberality of its kind discoverer) I believe it to be very distinct as a species. Those "common characters" pertain more or less to all that sub-family of *Adiantum*, most of the species also being exotic. Of this fern, its manner of growth, its black filiform stipes (indeed, the almost general blackish colour of the whole plant), its large black and shining scales, its small and variously-shaped pinnules, and, above all, their lacinate and sharply serrate margins, with compound and radiating veins and venules, afford good and constant characters.

II. I have not infrequently met with, and possess, dwarf specimens of *A. cunninghamii* (some being little pygmies), as well as extra-large ones, but these do not contain the peculiar and distinctive characters of this fern. [321]

Genus 13. *Cheilanthes*, Swartz.

1. *C. venosa*,⁷³⁸ sp. nov.

Plant slightly tufted. Stipe suberect and curved, 3 in.–3½ in. long, very slender almost filiform, terete, lightly furrowed on upper surface near base, glabrous, light-red and glossy (as, also, rhachis and subrhachises), with a few small weak scales scattered throughout. Frond 2 in.–3 in. long, sub-deltoid-ovate, 1½ in.–2 in. wide at base, apical lobe very large (for plant), deeply incised obtuse; bipinnate light-green, glabrous, with a few distant scattered fine weak and rather long white hairs on both surfaces; pinnae 4–5 jugæ; 3 lower pairs opposite, distant

738 Possibly *Cheilanthes sieberi* Kunze.

$\frac{3}{4}$ in.–1 in. on rhachis, sub-deltoid-ovate, 1 in.– $1\frac{1}{2}$ in. long, about 1 in. wide at base, petiolate; uppermost pairs subsessile and pinnatifid; pinnules ovate, obtuse, pinnatifid, deeply incised, lobed; lobes oblong; tips of lobes and lobules irregularly bluntly toothed, much veined; veins pinnate, free, regularly branching from midrib, largely dichotomous, each lobe and lobule containing many straight venules and veinlets, extending to margin. Sori loosely scattered, generally on tips of pinnæ and of lobes in irregular little batches, mostly very small, sometimes mere dots. Involucre green from the incurved margin of frond, small and (sometimes) 1–2–3-cleft and toothed, rarely covering sori.

Hab. Dry hills, among low shrubs and undisturbed indigenous herbage, in various localities in the County of Hawke's Bay; rather rare, nowhere common.

Obs. I. This is a very neat little fern; its fresh and charming green colour alike on both sides (which it also retains in drying), and its light-red glossy filiform stipe and rhachises, give it an elegant appearance, which is also increased on examination and observing the curious disposition of its sori and involucres, and its remarkably regular and curved numerous venation.

II. I have known this fern for a considerable time, but only during this year (1892) have I succeeded in obtaining really good specimens. I think its fronds are annual or biennial. Old states, more or less dried up, are difficult to examine closely and satisfactorily, and much resemble those of *C. tenuifolia*, Swartz, to which species (and also to *C. sieberi*, Kunze) it is pretty closely allied. But from *C. tenuifolia* it differs in several particulars

(*vide descript.*), and most especially in its peculiar and striking venation, which does not vary, and forms a good specific character. Sir W.J. Hooker has given a drawing with dissections of *C. tenuifolia* (likewise of *C. sieberi*) in his "Species Filicum," of which he also says, in his description of that fern, "Our figure will give a better idea of the plant than whole pages of description can do" [322] (*l.c.*, vol. ii., p. 83): there the venation of the pinnules is shown as extremely simple and distant and not extending to margins. And just so it also is shown in the larger drawings with dissections of *C. tenuifolia* given by Beddome in his "Ferns of Southern India," plate 188 (also referred to by Baker in his description of that fern in his "Synopsis Filicum"). There the veins in the lobes are simple and common, showing the midrib from the rhachis with 3–4 single veins on each side that do not reach the margin in each lobule; also the involucre continuously extending over 3 lateral and 4 apical veins, with its margin even. Moreover, *C. tenuifolia* is shown to be a much larger and coarser fern, tripinnate with 5–6 pairs of pinnæ, its lower pinnæ compound (or tripinnate) with longer petioles, their tips, with that also of the frond, being subacute; and in his description of this fern he also says, "Stipe and rhachis purple-black; the main rhachis is winged above, and the secondary and tertiary rhachises are all narrow-winged" (*l.c.*, p. 64); and Sir W.J. Hooker says the same in "Species Filicum," p. 82—characters that are not found in this fern, *C. venosa*.

Genus 16. Lomaria, Willdenow.

1. *L. pygmæa*,⁷³⁹ sp. nov.

Plant very small, tufted, 2 in.–3 in. high; subcaudex an erect thick bunch of old stipites $\frac{3}{4}$ in.–1 in. long, with numerous long black scales, acuminate, acute, glossy; roots long, spreading, terete, glabrous. *Barren frond* spreading linear-lanceolate, 1½ in.–2½ in. long, 2–3 lines wide at middle, pinnatifid, sub-membranous, pea-green, glabrous, glossy above, rhachis channelled; pinnules 13–15 on each side, alternate, regular, semi-orbicular or hippocrepiform, very small at base, apical lobe subacute with pinnate veins; margins slightly uneven, subcartilaginous, whitish; veins few, 3–4 pair in each pinnule, simple and forked, extending to margin, tips clavate; stipe slender, short, sub $\frac{1}{2}$ in. long. *Fertile frond* shorter, suberect, very slender and narrow, linear, 2 in. long, $\frac{1}{10}$ in. wide, pinnate; pinnæ alternate, orbicular, about $\frac{1}{2}$ line diameter, sessile, about 13 pinnæ on each side of rhachis, the lower and middle ones distant, the lower most minute, apical lobe 4 lines long. Sori numerous, spreading, close, compacted, covering pinna, dark-brown. Involucre narrow, dark-coloured, reverted, margins entire.

Hab. Open lands, damp spots rocky places, between Dannevirke and the East Coast, County of Waipawa; 1892: *Mr. H. Hill.*

Obs. A peculiar little species: its very small size, venation, and minute orbicular fertile pinnæ distinguish it readily from all others of the genus. [323]

739 *Blechnum membranaceum* (Hook.) Diels.

2. *L. procera*, var. *gracilis*,⁷⁴⁰ Col.

Plant tufted, erect, very slender; roots numerous, bushy, densely and finely hairy; hairs red. *Barren fronds* suberect and drooping, 9 in number from 1 rootstock, of various lengths, 4 in.–8 in. long, 1½ in.–2 in. wide, linear-lanceolate, pinnate; stipe 2 in., almost filiform, pale-reddish, dry, sulcate above, very slightly scaly; pinnæ very thin, pale-green, alternate, few, 7 on each side of rhachis in longest specimen and 4 on short ones, sub-linear-elliptic, the longest 1 in. long and 4 lines wide, patent and slightly falcate, subacute and obtuse, midrib very narrow, deeply channelled above with raised edges, margins sharply serrulate the teeth curved upwards and long, and close at tips, dimidiate, base truncate, the upper half more so, petiolate, petioles short very slender, ¾ in.–1 in. distant on rhachis, upper pinnæ subsessile, acute, the lower half decurrent, apical lobe linear-ovate acuminate, 1½ in. long, the lowermost pinnæ very small, suborbicular, 3–4 lines diameter; veins simple, rarely forked. *Fertile frond* erect, pinnate, 10 in. long, 2½ in. wide; stipe 6 in., much stouter than in the barren fronds but not 1 line wide, red, glabrous; pinnæ alternate distant, 6 on each side of rhachis, very narrow-linear, 1 in. long, 1/10 in. wide, sessile and decurrent, the lower pinnæ 1½ in. distant on rhachis, the upper 3 pairs closer, apical lobe 1½ in. long, the lower fruiting pair of pinnæ subsessile, and the lowermost pair of pinnæ barren very small 4 lines long broadly ovate tips rounded. Sori numerous, compact, dark-brown, not extending to tips of pinnæ, which are leafy 1–2 lines long, and so also the lower

740 *Blechnum minus* (R.Br.) Ettingsh.

fruiting pair at their bases. Involucrum dark-brown, subinvolute and adhering, very finely fringed throughout.

Hab. Open margin of low wood, edge of great plain south of Dannevirke, County of Waipawa; 1892; scarce: W.C.

Obs. I again visited that spot with difficulty, on recovering slowly from illness, in the autumn of 1892, and managed to bring away one entire and perfect plant, which looked surpassingly graceful in its sheltered home; and, although *primâ facie* it seems so very different from all the (known) varieties of *L. procera*, yet, on careful examination and comparison, I am obliged to consider it to be but another variety of that variable species.⁷⁴¹ Its striking points of difference are—its slender, graceful, and neat appearance; its few, thin, small, distant, obtuse pinnæ, with their finely-serrulate margins; its filiform and long stipes; and its densely-hairy and red roots. [324]

Order VIII. FUNGI.

Genus 24. *Ileodictyon*, Tulasne.

1. *I. (Clathrus) giganteum*,⁷⁴² Col.

741 WC: Sir J.D. Hooker, in his "Handbook of New Zealand Flora," (published thirty years ago), gives four varieties, of which he says, "The varieties enumerated keep their characters under cultivation." Some of them both Cunningham and myself had considered to be good and valid species, and to that number others have been added since.

742 *Ileodictyon giganteum* (Colenso) Colenso.

Receptacle pyriform, 14 in. long, 9 in. wide, white; interstices very large (some 4 in. by 2 in.), pentangular; ribs 6–8 lines wide, much and finely crumpled, with small triangular apertures in the middle of the rib at each outer angle. Volva ovoid, white, thick, skinny, gelatinous within, with long white rootlets.

Hab. On ground, edge of forest south of Dannevirke; 1892: W.C.

Obs. I. For a more particular account of this fine and highly curious fungus, including its peculiar manner of unfolding from its volva, see my paper, "Bush Jottings" (*supra*, Art. XLI.).

II. Since writing that paper I have received a copy of Dr. Cooke's "Handbook Australian Fungi" (lately published), and I find that he has removed *I. cibarium*, our more common New Zealand species, into the allied old Linnæan genus of *Clathrus*; and also given a drawing of *I. cibarium*, with its description (*loc. cit.*, p. 215), and this serves to settle my doubt as to the validity of this species.

**1892 Phænogams: A Description of some
Newly-discovered Indigenous Plants; being a
Further Contribution towards the making
known the Botany of New Zealand.
Transactions of the New Zealand Institute 25: 324-
338.**

[Read before the Hawke's Bay Philosophical Institute,
28th November, 1892.]

CLASS I. DICOTYLEDONS.

Order I. RANUNCULACEÆ.

Genus 3.⁷⁴³ Ranunculus, Linn.

1. *R. sychnopetala*,⁷⁴⁴ sp. nov.

Plant large, tufted; radical leaf suborbicular, 3 in. long, 3½ in. wide, apex slightly produced rounded and subtrilobed, base truncate and in a small degree turned up over lamina close to petiole, thickish, soft, upper surface green slightly hairy, the under-surface paler and more hairy; hairs weak [325] wavy reddish, thicker longer and subciliate at margins; 9–10-veined; veins pale, sunk in the upper surface, slightly conspicuous beneath; veinlets closely anastomosing, forming long narrow angular areoles; margins coarsely and irregularly crenate-serrate; petiole 1¾ in. long, 2 lines wide, stoutish, brown, hairy; hairs long appressed strigillose reddish; stipules at base

743 WC: The numbers of the orders and genera given here are those of them in the "Handbook of the New Zealand Flora."

744 Possibly *Ranunculus insignis* Hook.f.

small narrow. Flowering-stems 9 in. high, solid, stout below nearly $\frac{1}{4}$ in. diameter, two springing together from a single basal leaf; leaf subovate acuminate, stout, lamina $3\frac{1}{2}$ in. long $1\frac{1}{4}$ in. wide many-nerved (9); veinlets anastomosing; tip very obtuse; lateral margins coarsely serrate with 6–7 broad teeth, gradually tapering to base; petiole 1 in. long, very broad flattish and thick, nerves continued down petiole; small stipules at base; each flower-stem trichotomous 4 in. from base, surrounded by a pair of bract-like sessile oblong leaves $1\frac{1}{2}$ in. long; pedicels 1-flowered, stout, sub 6 in. long, with (in one specimen) a whorl of three leafy bracts about the middle, subovate sessile, irregular in size and in cutting, the largest having a pair of large lateral teeth almost trifid, the others entire, hairy, margins ciliate; hairs wavy reddish; and in the other specimen with a single trifid bract. Flowers: Calyx pale greenish-yellow; sepals 5, linear obovate, $\frac{1}{2}$ in. long, sub 2 lines wide, tip obtuse, concave, distant, hairy, margins ciliate, much veined; vein single at base, 5-branched at middle and united at top. Corolla pale-yellow glistening, 1 in. diameter; petals numerous (40–45) in 3 rows, recurved, cuneate, 8 lines long $2\frac{1}{2}$ lines wide, much veined, more so than sepal; tip rounded very obtuse entire; base tapering, claw long; gland small orbicular, about 1 line above base. Anthers numerous, stout, before bursting broadly elliptic, afterwards elongated and much narrower, deeply channelled on back, very glossy, same colour as petals; stamens broad flattish as wide as anthers, 2-nerved. Carpels 0, but instead a few small greenish petaloid leaves, much incurved and forming a small green ball.

Hab. Ruahine Mountain-range, east side, near summits of lateral spurs; 1891: *Mr. A. Olsen, Norsewood.*

Obs. Of this fine and very peculiar plant I have only received two flowering specimens, both, however, in good condition. At first I thought it to be a "monster" flower of *R. insignis*, Hook., or of *R. ruahiniclus*, Col.; but after a very close and patient examination and comparison I find it to be distinct, though, from its not possessing any carpels, but numerous small petals in their place, it may prove to be a "monster" (or double) flower.

2. *R. longipetiolatus*,⁷⁴⁵ sp. nov.

Plant erect, glabrous, stolons few, short. Roots numerous long wiry very slender; sometimes rooting at lower nodes of [326] flowering-stem. Leaves few, single, on tops of long petioles, spreading, in circumscription subreniform and narrow hemispherical, 1½ in.–2 in. long, 2½ in.–3 in. broad, trifoliolate, each lobe largely petiolulate subflabelliform and broadly cuneate, trilobulate, sinuses deep obtuse and very wide, lateral margins always entire, lobules trifid (and variously lacinate), generally with 1 large central and 2 small teeth their tips obtuse; petiolules slender sometimes 1 in. long, veined; lamina thin largely veined, with numerous compound anastomosing veinlets and venules; petioles fistular, 7 in.–10 in. long, stout when fresh, with a long narrow stipule at base. Flowers few small, single on long erect peduncles, some directly from the rootstock 9 in. long, others (and generally 1–3) distant on flowering-stem, axillary from a single caudine leaf and twice the length of its long petiole—sometimes 4

745 *Ranunculus macropus* Hook.f.

in. long, occasionally 2 flowers springing together axillary on separate pedicels. Sepals 5, much shorter than petals, concave, inflated, tawny, glabrescent, 2½ lines long, broadly-ovate or oblong-rounded, tips very obtuse, 3-nerved, nerves flexuous, margin very membranous, white, pellucid. Petals 6, flat, narrow linear-spathulate, 4½ lines long, sub 1 line wide, tips obtuse and emarginate, tapering to base, pale-yellow glabrous, 5-nerved; nerves straight branching above not extending to tip; gland near base small, reaching across petal, hollow, depressed. Stamens short, sub 24; anthers elliptic slightly subapiculate. Achenia orbicular, turgid, sub 1 line diameter, slightly rugulose-muricatulate; styles same length, curved, slightly puberulous; stigma capitate, subpenicillate. Receptacle small elongated oblong subclavate, coarsely hairy at base.

Hab. In watercourses, forests near South Norsewood, County of Waipawa; 1882: W.C.

Obs. This species is certainly near to *R. macropus*, Hook., but on a close examination and comparison there will be found several grave differential characters. Indeed, it was owing to my having supposed it to be that species, or a variety of it, that I have so long delayed describing it; and to this opinion I was in great measure led through merely reading the specific description of that species as given in the Handbook. Besides, I had intended to revisit Norsewood and to obtain more and fresh specimens—which also caused me to put it off—which I have never since done. Now, however, on referring to the full and particular specific description of *R. macropus* (the type specimens found by me at Poverty

Bay in 1839), as originally given by Sir Joseph Hooker in the “Icones Plantarum,” accompanied by a drawing and dissections (vol. vii., tab. DCXXXIV.), the differences are plain and great, and clearly shown in the drawing. That species has *much larger sepals than petals*, which peculiar character also caused Sir Joseph Hooker [327] there to observe, “A very remarkable plant ... from the smallness of its petals as compared with the sepals.” Besides this there are several other differential characters in its leaves, flowers, and fruit.

Order VI. CARYOPHYLLEÆ.

Genus *Cerastium*,⁷⁴⁶ Linn.

1. *C. truncatum*,⁷⁴⁷ sp. nov.

Plant annual, small, erect, 1 in.–2 in. high, simple, sometimes slightly branched, very hairy; hairs patent not viscid. leaves, radical subrosulate linear-spathulate, smaller than those on stem; stem-leaves linear-oblong obtuse, 3–5 lines long, sessile, dark-green, margins purple, ciliate; hairs jointed, white. Flowers 2–4, axillary near top, and 1 terminal, rather large for plant, open, 2 springing on long pedicels from one of pair of opposite leaves, pedicel $\frac{1}{2}$ in. long, slender, bibracteate at middle. Calyx shorter than petals, $2\frac{1}{2}$ lines long, lobes subacute, green, purple-tipped, with large white membranous

746 WC: This genus is not inserted in the “Handbook of the New Zealand Flora,” although those others very near it are—*Stellaria*, *Spergularia*, &c.

747 Probably an introduced weed.

margins. Petals longer than calyx, bifid half-way down, lobes acute; styles 5, long, hairy; capsule twice as long as calyx, stout, slightly curved, shining with 10 teeth; teeth short, very broad, tips truncate and notched. Seeds numerous, orbicular, muricated, ochraceous.

Hab. Open grassy plains south of Dannevirke, County of Waipawa; 1887–91: W.C.

Obs. I have long known this little plant, and have often slightly noticed it, supposing it to be an introduced British species (two or three of them being now common here, imported among grass- and clover-seeds), but during this spring (1891) I was led from its humble beauty to gather and closely examine it, and believe it to be a new and undescribed species, the teeth of its capsule being so very different from those of all other species known to me, and so affording a good differential character. The plant has some general resemblance to *C. semidecandrum*; it is an early spring flower.

Order XVIII. RHAMNEÆ.

Genus 1. Pomaderris, Labill.

1. *P. mollis*,⁷⁴⁸ sp. nov.

Shrub 9 ft. high, upright handsome growth, branched from base; branchlets densely stellate pubescent, also petioles under-surface of leaves flowering-stems and calyx on outside. Leaves alternate distant softish, usually 1 in.–2 in. apart, ovate, [328] 3 in.–4½ in. long, 1¾ in.–

748 *Pomaderris apetala* Labill.

2½ in. wide, tip obtuse, base rounded; also, often irregular in size and shape, some being much smaller, 1 in.–1½ in. long, elliptic, tip much rounded, on same branchlet with the large ones and generally below them; margins denticulate sub-crenate-serrate, dark-green, deeply rugulose, glabrous and shining above with sunken nerves, pale dull-green and stellate-hairy below, the hairs white and regularly scattered (not crowded) on lamina, but reddish and densely close on midrib and veins; veins few, regular, much produced, diagonal, parallel 4 lines apart, their tips branched on the posterior side; petioles stout, soft, ¾ in. long, terete, slightly sulcate on the upper surface, closely hairy. Flowers in large loose compound terminal (and subterminal) panicles, 5 in.–6 in. long, 7 in.–8 in. broad at base, subpanicles 4 in.–5 in. long, with a small leaf at base, their branches loose distant slender spreading. Flowers close, soft, subfascicled 3–6 together; pedicels about 1 line long; calyx pale-green, 1½ lines diameter, 5-parted, sepals ovate recurved, keeled above, densely stellate-hairy on outside, tube very short; petals 0; anthers subobovoid, obtuse, orange-coloured, filaments flattish erect a little longer than style; style stout furrowed, top 3-cleft one-third of its length; stigmas large, capitate, rough. Ovary hairy, with scattered adpressed stellate hairs and also other hairs simple erect acute as long as style. Capsule rounded, the exserted part as long as the adnate tube, dark-brown. Coccii whitish-brown, elliptic subapiculate, submembranous, convex keeled on inner face and opening by a basal slit extending half-way up, minutely puberulous.

Hab. Dry hills near Puketapu, west of Napier, Hawke's Bay; rare; 1890–92; flowering 10th November: W.C.

Obs. This shrub is certainly very near to *P. tainui*, Hector,⁷⁴⁹ differing, however, in size of plant, form, &c., of leaf, and wanting its gland to anthers, &c.; and as I have already noticed and described⁷⁵⁰ how closely two (at least) of our northern species of this genus approach each other until they are fully examined, just so it may be with these two plants. At all events, if this plant should prove to be identical with that species, then another legendary Maori support and witness (!) of their wild, mythical canoe-arrival on these shores will again have to be abandoned—with regret, not only by themselves, but also by their European supporters. [329]

Order XXII. LEGUMINOSÆ.

Genus 1. Carmichaelia, Br.

1. *C. multicaule*,⁷⁵¹ sp. nov.

Shrub about 10 ft. high erect, many stems close together from one rootstock, the thicker ones being about 3 in. diameter and very irregularly grooved and corrugated, bark smooth; stems below for 3 ft.—4 ft. from ground bare of branches; above the branches are very numerous suberect and dependent; the smaller branches long

749 WC: See Trans. N.Z. Inst., vol. xi., p. 428. Sir James Hector says, "flowering 5th December," "capsule not seen." His specific description of the plant is consequently imperfect, but his account of its discovery, &c., is interesting and worthy of perusal.

750 WC: See Trans. N.Z. Inst., vol. xviii., p. 258: *P. amœna*, Col., and *P. phyllicifolia*, Lodd.

751 *Carmichaelia australis* R.Br.

slender terete sub 1 line diameter, slightly geniculate; branchlets very numerous, alternate about 1 in. apart, the ultimate ones simple straight 7 in.–10 in. long, very narrow $\frac{1}{20}$ in. broad, dark-green, striate, with small scarious marginal bracts $\frac{1}{2}$ in.– $\frac{3}{4}$ in. apart. Leaves 0. Flowers not numerous, on some large branches none, alternate in small panicles containing 7–11 flowers $\frac{1}{2}$ in.–1 in. apart; peduncle with 1 deltoid brown bract at base slightly cut; pedicels 1–2 lines long, slender, much pilose, margins densely ciliate, hairs pure-white, striking, with many small scattered brown bracteoles. Calyx rather large, free, inflated, green, glabrous, submembranous, margins toothed; teeth black very prominent. Corolla small open variegated; standard oblate-orbicular 2 lines broad, largely retuse, much recurved, dark blue-purple with white margin, veined; wings linear-oblong thin white, longer than keel, their tips broad rounded, reddish; keel subreniform $\frac{1}{2}$ lines long, whitish, tip rounded pale-reddish. Filaments very slender capillary, pellucid membranous, flexuous; anthers small, elliptic, fawn-coloured; style very long, curved, persistent; stigma rather large, capitate, thickly puberulous. Pod narrow-oblong 4 lines long including long stout beak, glabrous, dark-green young; beak very stout subulate, $1\frac{1}{4}$ lines long, sublanceolate contracted at apex of pod.

Hab. Open grassy flats in gullies south of Dannevirke, County of Waipawa; 1889–92: W.C.

Obs. This shrub is peculiar from its habit and manner of growth; its main stems are curious objects, being so close together and numerously and largely furrowed with their bark unbroken. I have long known the plant, and have

often visited them seeking flowers or fruit, but have always been disappointed until this year, 1892, when, in November, I was gladdened on seeing many healthy young flowering buds showing themselves; fortunately I secured some specimens, though very young, and when I visited again before Christmas (almost purposely) I found but *very few* flowers and immature pods, and these only on one of the many branches. Of all the others I had seen the month before, there was now no trace. It is evidently allied to *C. corymbosa*, Col. [330] (Trans. N.Z. Inst., vol. xxi., p. 80), but differs in several characters. Sheep rest under its shade, and cattle browse on its young drooping branches, often without biting them off, owing to their toughness, leaving an unsightly chewed mass of dead hanging fibres; just as they do with chewed *Phormium* leaves, and the young flowering-culms of *Arundo conspicua*.

Order XXXIX. COMPOSITÆ.

Genus 1. *Olearia*, Mœnch.

1. *O. fasciculifolia*,⁷⁵² sp. nov.

A low bushy shrub, 4 ft.–5 ft. high. My single specimen, top of a branch 6 in. long, contains many close subdecussate branchlets, from 5 in. to 1 in. in length, the longer ones being again branched. Branchlets erect and suberect, slender, straight, opposite, semi-whorled, angled; bark reddish-brown, striate, with more or less of orange-coloured dry waxy exudation, which is also

752 *Olearia solandri* (Hook.f.) Hook.f.

scattered on leaves and more largely on involucre. Leaves few, distant, fascicled in 3 and 4, opposite, erect and patent, linear-oblong or sub-linear-spathulate, 1½–2 (rarely 3) lines long, less than 1 line wide, thickish, tip rounded, base tapering, margins entire narrowly revolute and appressed, dark-green glabrous above, greyish-white below with closely-appressed hairs; lower half of midrib prominent below; petiole short, stout. Heads single, scattered, axillary on lower half of branchlets, sometimes 2 together subfascicled, campanulate, 2 lines diameter; pedicels short, sub 1 line, stout. Involucral scales many, imbricate in 6–7 rows, orange-coloured with blackish dark-green central stripe, the lowermost small, obtuse; middle much larger, ovate, acute; innermost row very narrow acuminate, 2–2½ lines long. Florets few, produced beyond pappus, black when dry, very slender, weak, subreflexed. Pappus scanty, straight, glossy, nearly equal, scabrid, white, tips acute. Achene semi-terete, linear, 1 line long, grooved, thickest at top, pale, glabrous, shining. Disc smoothish, shining, pitted.

Hab. Open lands between Dannevirke and Weber, County of Waipawa; 1892: *Mr. H. Hill.* Flowering late in May.

Genus 17. *Senecio*, Linn.

1. *S. multinerve*,⁷⁵³ sp. nov.

“A low spreading shrub, about 4 ft. high.” My specimen, a branch 9 in. long (torn off from a larger one), shortly spreading into 3 slender erect branches, glabrous (and slightly-scattered puberulent whitish hairs), bark

753 *Brachylottis perdicioides* (Hook.f.) B.Nord.

furrowed reddish-brown. Leaves few, distant, scattered, thin, spreading, oblong-lanceolate and linear-elliptic, 1 in.–1 $\frac{3}{4}$ in. long, 4–6 lines broad, tips very obtuse subtruncate, base tapering, glabrous above, [331] slightly scabrid-puberulous below; margins thickened, coarsely and closely toothed, teeth knobbed; veins below very reticulate and dark; petioles slender, 4–8 lines long, grooved above, puberulent. Flowers bright-yellow, close, showy, in terminal corymbs beyond leaves; peduncles 1 in.–1 $\frac{1}{4}$ in. long, filiform 3-flowered, with a long narrow leafy bract at base; pedicels spreading, slender, 4–5 lines long, a long bract at the base and 2 linear bracteoles above the middle. Heads rather small, campanulate, 4 lines long. Involucral scales 5, oblong, slightly puberulent above, the 2 inner very broad 4-nerved, with, large membranous margins, their tips rounded and ciliolate, the 3 outer narrower. Florets few 7–8, 2–3 ray, 5 disc; lamina of ray broad for size of flower, 7-nerved, tips revolute. Pappus numerous, a little shorter than florets, rather harsh, glossy, white, scabrid, unequal. Achene linear, glabrous, obsoletely ribbed dark-brown. Disc alveolate, edges raised rough.

Hab. In a valley near Tolaga Bay, East Coast; rare; 1892:
Mr. H. Hill.

Obs. This plant is certainly closely allied to *S. perdicioides*, Hook.f., also a very rare plant from that same locality, discovered by Banks and Solander on Cook's first visit to New Zealand. I have been in doubt about describing it as being distinct; but there seem to me to be certain grave characters pertaining to it, which, if in *S. perdicioides*, could not have been unnoticed by

Hooker, as—its margined and knobbed leaves (which are also of a different form), its peculiar and handsome inner scales of the involucre, and its long bracts and bracteoles.

Order XLII. ERICEÆ.

Genus 8. *Dracophyllum*, Labill.

1. *D. imbricatum*,⁷⁵⁴ sp. nov.

(My single specimen) a branch 17 in. long, simple, straight, stout, as thick as a goosequill at base, base there for 3 in.—4 in. with dark-brown bark, light-reddish and ringed above where denuded under leaves—apparently a strong, healthy, vigorous young branch. Leaves numerous, close, erect and squarrosely spreading, linear, 4 in.—5 in. long, 4 lines wide, rather thin yet opaque, smooth, dry, concave, pale-green, glabrous, margins slightly and closely serrulate, tapering to apex, tip long, very narrow and acute, bases dilated $\frac{1}{2}$ in. wide, reddish, imbricate and largely amplexicaul; the upper leaves erect extending as high as panicle. Flowers terminal in a narrow contracted erect raceme-like panicle, 2 in.—2½ in. long, sub $\frac{1}{2}$ in. wide; bark glabrous, dark-brown, much grooved; few flowers, 3—4 on short branchlets, each branchlet with a long linear bract at [332] base, keeled and submucronate; pedicels about 1 line long; calycine bracts half as long as corolla, ovate, concave, finely serrulate, tips produced, acute. Corolla 4 lines long, narrow campanulate, reddish-orange, lobes shorter than tube, subdeltoid-ovate, lateral margins much incurved,

⁷⁵⁴ *Dracophyllum strictum* Hook.f.

whitish, tips narrow revolute. Anthers linear-elliptic, 2-lobed, included; filaments free twice as long as style; style 1 line long, slightly puberulent, stoutish, cylindrical, simple; hypogenous scales sub-linear-ovate (or lingulate), broadest at base, truncate and notched at tip. Ovary very small, scarcely 1 line diameter, with 5 minute rounded protuberances at top.

Hab. Open lands near Cape Runaway, east coast, North Island; 1892: *Mr. H. Hill.*

Obs. Apparently this striking species is allied to *D. strictum*, Hook. My specimen is a large one, though sadly crushed in long carriage in a saddle-bag, especially its more tender flowering part; sufficient, however, remained to enable me to describe it. Better flowering and fruiting specimens are wanted; also to know more about the size and shape of the shrub.

Order LIII. SCROPHULARINEÆ.

Genus 7. *Veronica*, Linn.

1. *V. darwiniana*,⁷⁵⁵ sp. nov.

A small neat glabrous shrub, with short spreading opposite simple branchlets, their bark light-brownish-green, with a narrow longitudinal pubescent line decurrent from bases of each pair of leaves to the next pair. Leaves subdecussate, distant, regular, subconcave, thickish, glaucous-green, minutely and thickly dotted with whitish specks on both surfaces, broadly-lanceolate,

755 *Inc. sed.*: possibly *Hebe venustula* (Colenso) L.B.Moore.

8–9 lines long, $2\frac{1}{2}$ –3 lines broad, not keeled, sessile, tips acute, blunt, margins entire lighter green (or yellowish-green). Flowers subterminal in 2–4 opposite axillary racemes, having a subcorymbose appearance; racemes short sub 1 in. long, the flowers very thickly set; peduncle 6–7 lines long, pubescent, as also are pedicels and bracts; pedicels sub 1 line long; bracts ovate acute submembranous, adpressed, longer than pedicel. Calyx glabrous, lobes broadly ovate, green with white membranaceous margins, tips ciliolate. Corolla white, 3 lines diameter, lobes incurved obtuse, the 3 larger oblong, the upper solitary, the lower lobe very small; tube 1 line long, throat puberulous; anthers largely exserted; purple; style slender, patent, 4 lines long; stigma small, penicillate. Capsule dorsally compressed, 3 times as long as calyx, broadly-ovoid turgid, red-brown, veined; valves 2-fid, gaping; seeds numerous, orbicular and broadly-elliptic, disc form thickest in the middle, light-brown, glabrous, shining. [333]

Hab. On hills in the interior, Hawke's Bay; 1890–92:
W.C.

Obs. I. A species *primâ facie* near to *V. colensoi*, Hook., but differing in several particulars—as, leaves smaller, subconcave and of another form; flowers pedicelled, bracts thin and longer than pedicels; lobes of calyx thin and ciliolate; corolla lobes very different, with puberulous throat; capsule larger, &c.

II. Named in honour of the illustrious Darwin who visited New Zealand, with Captain Fitzroy, in H.M.S. "Beagle," in 1835, and with whom I had the honour and pleasure of spending Christmas Day in that year.

2. *V. oligantha*,⁷⁵⁶ sp. nov.

Plant small herbaceous slender simple glabrous, suberect and decumbent, 3 in.–6 in. high, sometimes with a very few small branches, main stems and pedicels closely and finely puberulent. Leaves few rather distant, pale-green, broadlyovate and broadly-elliptic almost suborbicular, 2½–3½ lines long, 2–2½ lines broad, margins cut-crenate, and those of the upper and calycine leaves finely ciliolate, tips obtuse rounded; midrib below keeled prominent; 3-nerved, largely veined, veins compoundly anastomosing; petiolate, petioles sub 1 line long. Flowers very few, distant, small, single, axillary in caudine leaves in the upper part of the stem and terminal, usually 3–4 pairs, the lowest pair opposite, the upper ones alternate, pedicelled, pedicels erect stout nearly 2 lines long. Calyx 4-cleft to base, segments oblong, obtuse, 1-nerved, shorter than corolla. Corolla pale, small, 1½ lines long, tube very short scarcely any, segments all rounded the upper one the largest; much veined, veins forked. Stamens long curved; anthers large exserted, orbicular, claret-coloured; style very long, longer than capsule, filiform, persistent; stigma large capitate. Capsule fawn-coloured, sub-reniform-orbicular $\frac{1}{10}$ in. broad, compressed, notch shallow with a few erect glandular hairs on upper margin. Seeds very minute, 50 and upwards in each capsule, oblong, thickish, centrally attached, pale fawn colour.

756 Probably an introduced weed.

Hab. Among grasses and other low herbage, banks of streams, edges of woods, south of Dannevirke, County of Waipawa; 1892: W.C.

Obs. Another small herbaceous species of this genus to be added to those already lately described by me (*Trans. N.Z. Inst.*, vol. xxiv., pp. 391–393), and, though pretty closely related to them, distinct from all; perhaps *V. macrocalyx* is its nearest ally. This little plant is somewhat striking at first sight from its very pale-green leaves, and also, on examination, from the great regularity of its few flowers 3–4 pairs, of which, [334] however, only a single corolla may be found on each stem at one time; no doubt owing to the extreme shortness of its tube, which causes it to fall quickly off on the enlargement of its ovary.

CLASS II. MONOCOTYLEDONS.

Order VII. LILIACEÆ.

Genus 3. *Cordyline*, Commerson.

1. *C. hectori*,⁷⁵⁷ sp. nov.

Trunk arboreous, simple, erect, from 6 ft. to 30 ft. high. Leaves numerous erect and spreading all round, linear-lanceolate, 4 ft. 10 in. long, 6½ in. wide at middle, gradually contracted to 4 in. wide at 7 in. above base, and again expanding to 5½ in. at base, acute not acuminate, rather thin for size (chartaceous), somewhat softish (not harsh, as in *Phormium* and in *C. australis*), but very thick

757 *Cordyline indivisa* (G.Forst.) Steud.

at base, closely striated, margins entire, red thin and slightly recurved, glabrous, greenish-purple above with a reddish hue, and glaucous below with red veins; veins very numerous, above 100 on either side of midrib, parallel, slightly and regularly diagonal, extending nearly the whole length of lamina, and of three kinds—viz., (1) stout red prominent shining, distant about $\frac{1}{4}$ in. from each other; (2) smaller and finer, intermediate and reddish; (3) obsolete again intermediate and glaucous; the midrib red glabrous and glossy, very stout and large at base and for some distance above, but decreasing regularly towards apex and there vanishing, striate-veined on the under-surface for two-thirds length from base. Panicle pendulous, obovate, thick compressed, 16 in. long and 17 in. girth over all; peduncle (or main stem) 4 in. long,⁷⁵⁸ thick $3\frac{1}{2}$ in. girth; subpanicles (simple racemes) numerous, straight, obfastigiate, imbricate, each 7 in. long, linear-acuminate, $2\frac{3}{4}$ in. girth, a single bract at base $1\frac{3}{4}$ in. long, 4 lines wide at base, many-nerved, subulate, acuminate, acute. Flowers very numerous and close together; pedicels stoutish, thickened at top, 2 lines long, with 2 bracteoles on each, the outer one the longer, 3 lines long, sub-linear-ovate, 1-nerved, tip subacute, the inner one broader, irregularly shaped, semi-amplexicaul, apex sometimes retuse, and 2–3-fid, acute, acuminate, very membranous. Perianth small, sub $\frac{1}{2}$ in. diameter; segments narrow-oblong, split to base, subequal, much recurved, 3-nerved, nerves prominent. Stamens broad and flat at bases, adhering to lobes one-third of length from

758 WC: But I have not got the whole of it, only that portion which forms part of the panicle, and where the pedicels with flowers begin.

base, shorter than style, slightly incurved over ovary; anthers linear-elliptic. Style sub 2 lines long, stout, grooved. Berry globose nearly 2 lines diameter, glabrous, [335] blue; about 16 seeds in each; seeds black, shining, usually 3-sided, flat on two sides and rounded on the third, but when fewer in number gibbous.

Hob. "On the spurs and in the gullies of the Ruahine, Kaweka, and Kaimanawa Mountain-ranges, County of Hawke's Bay; alt. 2,000 ft.—4,000 ft. Sometimes growing in the woods, and sometimes in the open lands, but more generally along the edges of woods, and among scattered shrubs."—*Mr. Thomas Hallett, in lit.*, August, 1892.

Obs. I. Mr. Hallett also says in his interesting letter, "These trees vary in height from 6 ft. to 30 ft. but are generally about 12 ft. high in open lands, and 20 ft. in woods. The flowering-stem hangs down beside the trunk of the tree. The leaves sent were cut from a tree growing at 2,100 ft. alt. above sea-level, and at about 7 ft. above ground; there were 60 of them besides the small unfolded central ones; the diameter of the trunk was 6 in. Each leaf in falling off leaves a ring on the stem, which becomes very indistinct after a few years; and, as several leaves grow every year, there are many rings formed, so that the age of the plant cannot be determined by them."

II. I have long known this plant—from my *first* seeing it in its native habitat in the 30s, and often afterwards in the 40s, when travelling in the mountainous interior of this North Island, and also in following years occasionally

cultivated in gardens⁷⁵⁹ —but had never seen its flowers; and from the description of Forster's plant, *C. indivisa*, obtained by him in the South Island (as given by Hooker), I always had a doubt of it being the same species as this one, which doubt was also further increased through my certain knowledge that Forster had never been in this North Island. And when I read "the valuable communication regarding the *Cordylines*" made by Sir James Hector to Sir Joseph Hooker,⁷⁶⁰ I felt pretty well confirmed in my opinion. Sir James Hector wrote,—

"5. *C. indivisa*. This is the broad-leaved deep-green *ti*,⁷⁶¹ with red veins, a single head, and long elegant flowers, that Forster found in Dusky Bay. The leaf has a slight resemblance to the true *toii* of Colenso, which has led to the confusion, no doubt. [336]

"6. *C. sp.*? *Toii*. A large tree, with many heads, and huge broad massive leaves, yellowish, with yellow and red veins, and ponderous inflorescence with long bracts and black shiny seeds. This is the *ti* that the Natives use for mats, &c. The portion of the description of the Handbook

759 WC: I had for several years fine plants of it growing well in my garden at Waitangi (Hawke's Bay), with other mountain plants, as *Ranunculus insignis*, *Aciphylla colensoi*, *Calceolaria repens*, *Cordyline banksii*, *Anthericum hookeri*, &c. All these flourished and flowered there until a very severe and long continued flood, which overflowed my garden and deposited a large amount of silt, which destroyed them all.

760 WC: Handbook of the New Zealand Flora," p. 743.

761 WC: Ti is the Maori name for the Cordylines; it may be called their generic one.

which refers to *C. indivisa*, and which you got from Colenso, applies to this plant."

To this Sir J. Hooker adds, "I have no Dusky Bay specimens of Forster's plant, but Colenso's agrees well with Forster's figure in the British Museum" (*loc. cit.*). And in my fully describing this northern species of *Cordyline* I have also, with very great pleasure, named it in honour of our wellknown scientific naturalist, Sir James Hector, K.C.M.G., M.D., F.R.S., &c., who had not only seen both species growing in their native habitats in his travels in the North and South Islands of New Zealand, but had at an early date (prior to 1864) called Sir Joseph Hooker's particular attention to their specific differences.

III. From time to time of late years I have made several endeavours to obtain both flowering and fruiting specimens of our northern subalpine *Cordyline*, but have always failed until this present year (1892), when, through Mr. Hallett's kindness and care, I obtained what I had so long sought; I having long known him, and he being a resident settler far away in the hilly interior, and pretty near the home of these plants, and well acquainted with them. To him I feel much indebted for the several packages of specimens in various states he so readily obtained and sent me, though at no small trouble and labour to himself, as well as for his interesting notes and letters concerning the plant. And, not being satisfied with the specific description of *C. indivisa* as given by Hooker, both in his "Flora Novæ-Zelandiæ" and in the Handbook, and not possessing the fifth volume of Kunth's "Enumeration" (though I have vols. 1-4), and

finding, on inquiry, the said fifth volume was not here in the colony, I got a kind naturalist friend to write to Berlin to get a verbatim copy made from Kunth's work, and this I received a few months back, which with me settled the question concerning the specific differences of the two plants.

IV. In conclusion, I may observe that several striking *primâ facie* characters in this species here described do not accord with those of *C. indivisa (vera)*, Kunth: *e.g.*, Sir James Hector mentions its "long elegant flowers" (*loc. cit.*), and Sir Joseph Hooker also calls them "the large flowers," with "its excessively thick and coriaceous leaves" (Handbook, p. 282), which leaves, however, are really smaller, as described by Kunth, who says of them, "2–4 pedes longa, medio 4–5 polli-caris, supra basin 1½–2 poll. lata, rigide, coriacea"; and, further, [337] the panicle as being much larger—"3–4 pedalis"—with other differences, as "ovula in loculo 5–6," and the plant to be "10–20 pedalis." ("Enum.," v., 30.)

Genus 6. Arthropodium, Brown.

1. A. *ramulosum*,⁷⁶² sp. nov.

Plant small, slender, glabrous. Leaves 10, prostrate, spreading around stem subrosulate, linear-lanceolate, 9 in.–10 in. long, 3 lines wide, 3 innermost widest, concave, very acuminate tip acute, base half-clasping, membranaceous, flaccid, somewhat curved or subfalcate, dark-green, much parallel-nerved and striate on under-surface and so the caudine leaves. Stem single, erect, 18 in. high, purple, slightly geniculate at nodes, 12-branched,

762 *Arthropodium candidum* Raoul.

base 1½ lines diameter, apex flowering; branches green, striate, alternate, distant, the lower ones 7 in. long, decreasing gradually in size upwards, the uppermost 3½ in. long at 4 in. from tip of stem, spreading horizontally; the lower branches 2 in. apart on stem, the upper ones sub 1 in.; no branch at lowest node 1½ in. from base, but a simple very long caudine leaf or bract 7 in. long; at the lowest node of the basal branch a branchlet 1½ in. long 2–3-flowered, and at 2 nodes next above on same branch 2 flowers from each (this peculiarity also occurs at the lowest node of the apical portion); at the base of each branch are 2 leaf-like caudine sessile linear-acuminate bracts, the longer one 5 in. long 3 lines wide, with a minute lilac-coloured membranaceous bracteole in the axil between branch and stem (also in the axils of all the branches), 2-nerved, tip acute and bifid. Flowers scattered, generally 12 on the longer branches each ¾ in.–½ in. apart; pedicels ½ in. long, slender, jointed above middle, all bracteolate with long green bracteoles. Perianth small white, segments 2 lines long, narrow-oblong nearly alike, reflexed, each having 3 faint longitudinal medial lines (or nerves) parallel and close, the 3 outer segments stouter margins entire, tips subacute and thickened, the 3 inner very membranous margins slightly denticulate-erose, tips truncate; filaments white shorter than perianth 1½ lines long erect spreading, their upper two-thirds densely hairy bushy throughout, extending close up to anther; hairs white stout, glistening, tips obtuse; anthers small $1/24$ in. long, pale, linear; style erect a little longer than anthers; stigma simple, capitate, flat, spreading; ovary green glabrous scarcely 1 line long rounded-oblong.

Hab. In a rocky spot near Mangatoro, south of Dannevirke, County of Waipawa; 1892: W.C.

Obs. I. This is a striking and graceful species, having [338] affinity with *A. candidum*, Raoul, and *A. reflexum*, Col.,⁷⁶³ but widely different from both in habit and in general appearance and in several important characters. Its leaves (both radical and caudine) are larger and differently shaped and coloured (not like common grass leaves); stem much taller and 12-branched; branches very long and patent (and sometimes again branched); flowers smaller with different perianth-segments and anthers. But while the differences are many and great they are difficult to accurately describe in words, though soon apparent on examination and comparison with the above-named two species. This plant is also allied to a New Caledonian one—*A. neocaledonicum*, Baker. It also possesses in a striking degree that peculiar quality I had noticed in *A. reflexum* (l.c.), of only one flower (on a branch) opening at one time, and this in early morning, and so remaining until evening, when the perianth falls down, resuming its former position, and closely enwraps the ovary, as in the other plant.

II. I have only seen this one specimen here described, and the peculiar (almost *unique*) manner of my getting it deserves a brief notice. In June, 1892 (during a long wet winter season), I received a dripping muddy parcel of small ferns and other low herbaceous plants, roots and all, in tufts, as torn up from their low and wet habitat (the friend who sent them was there on a geological visit). It

763 WC: Trans. N.Z. Inst., vol. xviii., p. 275.

took me some considerable time to wash and clean them, and while so engaged I found a very small unequally semi-fascicled or trilobed root (less than a shilling in circumference), without any traces of leaves, stem, &c., and apparently half-dead: this, however, I kept and planted, and this neat plant has been evolved from it. So I am rewarded.

1892 A List of Fungi recently detected and collected in the Bush District, County of Hawke's Bay; being a Further Contribution to the Indigenous Flora of New Zealand.

Transactions of the New Zealand Institute 25: 338-340.

[*Read before the Hawke's Bay Philosophical Institute, 28th November, 1892.*]

IN January last I despatched to the Director of the Royal Botanic Gardens, Kew, London, another lot of *Fungi* that I had gathered at various times during the preceding year in the forest country around Dannevirke. This parcel contained [339] about two hundred separate packets. The Director, Mr. Thiselton-Dyer, soon put them into the hands of Dr. Cooke, the eminent fungologist, for examination and determination, as he had also done on

former occasions.⁷⁶⁴ I have recently received from Kew the list of the same, as kindly named by Dr. Cooke; from which it appears that most of them were duplicates of those I had formerly transmitted, several, however, being better specimens, and also in different states of age and growth. These that are new to our New Zealand flora are here given; few of them I take to be really *species novæ*.

1.⁷⁶⁵ AGARICUS, Linn.

- A. (Pleurotus) bursæformis, *B.*
- A. (Pleurotus) diversipes, *B.*
- A. (Pleurotus) sordulentus, *Fr.*
- A. (Collybia) laceratus, *Lasch.*
- A. (Pluteus) cervinus, *Fr.*
- A. (Pholiota) unicolor, *Fr.*
- A. (Pholiota) pumilus, *Fr.*
- A. (Flammula) vinosus, *Fr.*
- A. (Flammula) crociphyllus, *C. and M.*
- A. (Flammula) purpureo-nitens, *C. and M.*
- A. (Lepiota) imperfect.
- A. (Leptoma) æthiops, *Fr.*
- A. (Clitocybe) laccatus, *Fr.*
- A. (Psathyrella) disseminatus, *Fr.*
- A. (Leptonia) placidus, *Fr.*
- A. (Stropharia) semiglobatus, *Fr.*

4. MARASMIUS, Fries.

- M. hematocephalus, *M.*

764 WC: See lists, Trans., N.Z. Inst., vol. xvii., p. 265; vol. xix., p. 301; and vol. xxii., p. 391.

765 WC: The numbers attached to the genera are those of the same in the "Handbook of the New Zealand Flora."

10. POLYPORUS, *Fries.*

P. isidioides, B.

16. STEREUM, *Fries.*

S. amænum, Kal.

obliquum, B.

27. GEASTER, *Micheli.*

G. subiculosum, C. and M.

30. LYCOPERDON, *Tournefort.*

L. australe, B.

L. perlatum, Fr.

L. constellatum. [340]

50. AECIDIUM, *Persoon.*

Æ. gallii, P.

60. PEZIZA, *Dill.*

P. campylospora, B.

68. HYPOCREA, *Fries.*

H. rufa, Fr.

73. NECTRIA, *Fries.*

N. ditissima, Tul.

TREMELLA, *Fries.*

T. fuciformis, B.

TRICHIA, *Hall.*

T. affinis, R.

POLYSTICTUS.

P. decipiens, Schw.

P. hirsutus, Fr.

P. drummondii, B.

FOMES.F. *zealandicus*, *Cke.*F. *annosus*, *Fr.***PORIA.**P. *nitida*, *Fr.***ACTINONEMA.**A. *rosse*, *Fr.***PATELLEA.**P. *adamsoni*, *B.***HELVELLA.**H. *monachella*, *Fr.***SYNCHYTRIUM**S. *melicopidis*, *C. and M.***XEROTUS.**X. *glaucophyllum*, *C. and M.*

**1892 Memorandum of a few new species of
Hepaticæ lately detected in the Seventy Mile
Bush District; as kindly determined by Dr. F.
Stephani, of Berlin.**

Transactions of the New Zealand Institute 25: 341-
342.

[Read before the Hawke's Bay Philosophical Institute,
28th November, 1892.]

IN forwarding to Kew the *Fungi* mentioned in the preceding paper, I also sent a lot of *Hepaticæ* that I had collected at various times and seasons with them. These

were put by the Director at Kew into Dr. Stephani's hands for examination and determination, as on a former occasion;⁷⁶⁶ and I have recently received from Kew a list of them (but without description), and also a long enumeration of many others sent with them that have been already described in the "Handbook of the New Zealand Flora," in several volumes of the Transactions of the New Zealand Institute, and also in some modern European works.

The species really new to science are only four, while five others that were known have now been found in New Zealand; there were also a few others that were barren or too imperfect to be named, and many that (according to Dr. Stephani) were very fine and interesting.

Moreover, Dr. Stephani's remarks (of several species)—"There have been two forms sent of very different appearance, the normal one growing in places exposed to sunlight, stout and tough very dark, in a dry state almost black and horny, lobules large; while a common variety growing in dark forests is flaccid quite green, lobules small," &c.—are worthy of being copied here.

I. *Species novæ*:—

Symphyogyna subpetiolata.

Aneura papulosa.

Anthoceros arachnoideus.

Lophocolea erectifolia.

766 WC: See Trans. N.Z. Inst., vol. xxiv., p. 398.

II. Species already known, but hitherto not from New Zealand:—

Metzgeria crassicostata, *St.*
Lepidozia quadrifida, *Ldbg.*
Bazzania mittenii, *St.*
Balantiopsis diplophylla, *Mitt.*
Porella stangeri, *L. et G.* [341]

III. Species also in the same lot, already described by me (in the Transactions of the New Zealand Institute), and now confirmed by Dr. Stephani as valid species novæ:—

Sympyogyna undulata.
Aneura bipinnatifida.
A. alba.
Fossombronia perpusilla.
Bazzania elegans.
B. nitens.

Also, my *Sympyogyna connivens* has been altered to *Pallavicinia connivens*, *St.*, and my *Zoopsis tenuicaulis* to *Zoopsis leitgebii*, Carr et Pears.—very likely from specimens I had early sent them.

**1892 Observations on Mr. T. White's Paper "On
the Native Dog of New Zealand" —
Transactions of the New Zealand Institute,
Vol. xxiv., Art. 51. *Transactions of the New
Zealand Institute* 25: 495-503.**

[Read before the Hawke's Bay Philosophical
Institute, 28th November, 1892.]

Every kind of evidence is made to tell by writers who have a theory to defend.

MAX MÜLLER: "The Gifford Lectures," 1891, p. 428.

As headstrong as an *allegory* on the banks of the Nile.
(Mrs. Malaprop.) SHERIDAN: "The Rivals."

I REGRET to see a long paper by Mr. Taylor White in the last volume (xxiv.) of Transactions of the New Zealand Institute, ostensibly on the native dog of New Zealand; but, as far as concerns the genuine native dog of New Zealand, it is full of error. And as he has mentioned my name in his paper, and so some of his correspondents (though scarcely fairly), I feel constrained to write a little more additional on that subject. Moreover, I am the more inclined to do this through having very recently obtained some further valuable authentic information on the ancient and long-extinct New Zealand dog. Not, however, that any such was wanted by the seeker after real facts to complete what we already knew concerning it.

Mr. White's paper is pretty nearly wholly a compilation, and that from newspapers and correspondents—men of to-day. Much, however, of what they have written is correct (and I could furnish similar statements long known to me, from *before* this country became a colony, respecting both wild and tame *imported* dogs in New Zealand), but it has nothing whatever to do with the subject in question. Had Mr. White really cared to know the truth—the indisputable and genuine [496] historical facts—concerning the ancient New Zealand dog he would have followed the intimation I had volunteered to give him concerning it in a letter I wrote to him in December, 1890, in reply to his inquiry.⁷⁶⁷ For had he done so I venture to think he would not have written another paper on that subject. Of course, in my so saying, I suppose he had *not* seen my paper on the New Zealand dog, therein so exhaustively brought forward by me; if he had, however, done so, then he seems to have wilfully ignored all the certain knowledge concerning it, in his redundant zeal to establish a “fad” of his own.

Professor Max Müller very justly and eloquently observes in his late lectures at Glasgow (which is highly applicable here), “What is of immense importance in all scientific discussions is the spirit of truth. To make light of a fact that has been established, to ignore intentionally an argument which we cannot refute, to throw out guesses which we know we cannot prove—nay, which we do not even attempt to prove—is simply wrong, and

767 WC: He copies, indeed, a small portion of my note, on an entirely different subject (paper, p. 542).

poisons the air in which true science can breathe and live." ("The Gifford Lectures," 1891, p. 81.)

And, as I happen to have taken a copy of my note to Mr. White (referred to above), I give it here verbatim, from which it will be seen how I had put him on his guard, as well as kindly indicated the right direction:—

Napier, 25th December, 1890. ⁷⁶⁸

1893 Description of a large species of *Iulus*.

Transactions of the New Zealand Institute 26: 106.

[*Read before the Hawke's Bay Philosophical Institute, 9th October, 1893.*]

Iulus (Spirostreptus) fijiensis,⁷⁶⁹ Col.

Body cylindrical, stout, back very convex, smooth, glossy, hard, 6 in. long, 1½ in. across back from bases of legs on each, side, dark umber-brown, somewhat mottled, darkest at ends; 5 blackish bands, nearly equidistant, the first about one-third length from head; segments imbricate, 58, about 1 line wide, but a little narrower at

768 White took offence (Trans. 26: 585), "Mr. Colenso, F.R.S., &c, has attacked me most bitterly...", and had the last word on the subject in 1896.

769 *Spirostreptus fijiensis* Colenso.

extremities. Head broad, rounded, smooth. Eyes composed of many facets, forming a broadly-deltoid dark-blue-black patch above at base of antennæ, its angles rounded, having a regular papillose appearance; facets subglobose in 8 rows, 9 facets broad at base. Antennæ 3 lines long, 7-jointed; joints subclavate, the terminal one very short, the second echinate, the third and fourth slightly hairy; tips of maxillary processes hairy. Legs, 2 to each, segment, $3\frac{1}{2}$ lines long, subterete, curved, 7-jointed, the terminal joint with a single acute sharp claw, and also 1–2 minute accessory ones, or short stout hairs; colour paler-brown. Weight, $\frac{1}{2}$ oz.

Hab. Fiji; specimen obtained living at Dannevirke (Seventy-mile Bush), from a bunch of bananas imported.

Obs. I have had this fine myriapod in my possession for some time, having vainly endeavoured by inquiry, both North and South, to obtain some information respecting it, supposing, from its size and habitat, it must be known and described. I now, however, provisionally describe it—in part, as, from it having died with its head much, incurved, I cannot well get at its mouth, &c, without breaking it up, and, having but a single specimen, I am unwilling to do so.

1893 Phænogams: A Description of a few Newly-discovered Indigenous Plants; being a Further Contribution towards the making known the Botany of New Zealand.
***Transactions of the New Zealand Institute* 26: 313-320.**

[Read before the Hawke's Bay Philosophical Institute, 9th October, 1893.]

CLASS I. DICOTYLEDONS.

Order I. RANUNOULACEÆ.

Genus 3.⁷⁷⁰ Ranunculus, Linn.

1. *R. sychnopetala*,⁷⁷¹ mihi.

Having this year received perfect specimens of the flowers of this fine plant, I can now supply what was wanting in the former description of it.⁷⁷² Achenes numerous, roughish, sub 50, styles much produced 1 line long erect and slightly recurved, greenish-yellow; tips minutely penicillate; receptacle elongated, ovoid. The anthers are also placed in 4 rows, the outer 2 rows patent, the inner 2 rows shorter, erect. While, however, the flowers were perfect, and in good condition for examination, they were not advanced enough to enable me to say much of their achenes, the same being unripe.

770 WC: The numbers of the orders and genera given here are those of them in the "Handbook of the New Zealand Flora."

771 Possibly *Ranunculus insignis* Hook.f.

772 WC: Vide Trans. N.Z. Inst., vol. xxiv., p. 324.

Hab. (with former-described). Norsewood; *Mr. A. Olsen:* 1893.

Order XXII. LEGUMINOSÆ.

Genus 1. Carmichaelia, Br.

1. *C. micrantha*,⁷⁷³ sp. nov.

“A much-branched erect shrub, about 8 ft.–9 ft. high”; branches terete, tawny-yellow-green, glabrous; my specimen, the top of a large branch about 1 ft. long, $2\frac{1}{2}$ lines diameter at base where cut off, the bark curiously (almost symmetrically) closely split-fissured longitudinally; fissures lanceolate sub 1 line long ultimately coalescing, with purple-coloured edges, [314] minutely transversely and regularly nicked; branchlets numerous alternate dichotomous, straight, striate, 8 in.–9 in. long, slender, terete, the larger ones about 1 line diameter, the youngest wiry, filiform, and pubescent; hairs scattered, weak, white, with many stem-clasping broad obtuse bracts near each other at their tips. Leaves 0. Flowers very numerous, usually in small depressed corymbs of 5, sometimes 2, and sometimes only 1 flower, on the smaller branchlets. Peduncle and pedicels nearly equal in length, short sub 1 line long, pilose, with many fawn-coloured scarious bracteoles, their edges jagged. Calyx dry, semi-scarious, loose, large for flower, half as long as corolla, slightly pilose; margins sinuate and minutely-toothed, finely ciliolate. Corolla less than $\frac{1}{10}$ in. long, standard purple with dark veins. Pod

773 *Carmichaelia australis* R.Br.

(immature) glabrous, small, about 1 line long, narrow-linear-ovoid, acuminate; beak much longer than pod, curved; stigma capitate, roughly penicillate.

Hab. Edges of forest, head of Rangitikei River, County of East Taupo; *Mr. Patrick Stirling McLean*: 1893.

Obs. After close examination I have decided to bring this plant forward as a *species nova* of this curious genus; at the same time I am not wholly satisfied concerning it, through not having seen its ripe fruit. Its whole aspect, however, is peculiar, and apparently differing from its congeners,—in its numerous terete long and filiform yellow-green branchlets with their curiously-fissured bark, and the different disposition of its flowers, with their numerous-coloured bracteoles; unfortunately, its fruit was immature. The one large specimen I received is evidently the upper portion of a large branch, and is about 12 in. long.

Order XXVI. DROSERACEÆ.

Genus 1. *Drosera*, Linn.

1. *D. circinervia*,⁷⁷⁴ sp. nov.

Root simple, slender, straight, 1½ in. long, broken(?). Leafy stem slender, erect, simple, 8 in. high, glabrous. Leaves largely glandular-hairy on upper surface and at margins, their glandular apices small, elliptic, red. Lower leaves at summit of the stock 8, subrosulate spreading, suborbicular not peltate, 1½ lines diameter, decurrent;

774 *Drosera auriculata* Planch.

petioles 6–7 lines long, stoutish; stem-leaves 11, peltate, nearly equidistant throughout stem sub $\frac{3}{4}$ in. apart, lunate, truncate on the straight side, and there 3 lines broad, the 2 angles largely produced and bearing at their tips 4–5 very long flexuous cilia: the curvilinear margin much narrowly laciniate-fringed; the two principal nerves biorbicicular from the insertion of the petiole; petioles filiform sub 1 in. long. Flowers (immature) small(?) at top of stem, in [315] a small branched sub-corymb; pedicels about 1 line long. Sepals glabrous, smooth, black.

Hab. Open lands; Taupo: 1885.

Obs. I. This plant is nearly allied to *D. auriculata*, Backh. and also to *D. peltata*, Sm., differing, however, from the former in its lower leaves being not peltate with long petioles, and from the latter in its lower leaves being decurrent on longer and narrower petioles, and from both in the largely laciniate margins of its leaves, their greatly extended angles, and their peculiar orbicular venation. Its flowers are also differently disposed, not being racemose and with smooth sepals.

II. I received this plant several years ago, with others, from Taupo; and from its being immature I refrained from describing it, as I had been led to expect more complete specimens. It stains the drying-papers red, like others of its genus; and I believe, from its long slender simple and broken tap-root, that, like some of them, it also arises from a bulb. Having but a single specimen, which, though not fully developed, is entire, allowance must be made for not giving any description of its floral parts.

Order XXIX. ONAGRARIEÆ.

Genus 2. Epilobium, Linn.

1. *E. nanum*,⁷⁷⁵ sp. nov.

Plant very small, glabrous, erect, $2\frac{1}{2}$ in. high; stem simple red slender, minutely bifariously puberulent on the basal portion; leaves few, opposite, distant $2\frac{1}{2}$ lines apart on stem, linear-lanceolate, sub 2 lines long, subacute, with 1 (rarely 2) very small blunt teeth at lateral margins, thickish, green, subpruinose, tapering, the basal half of midrib below red prominent; petiole very short, stout. Flower solitary, axillary near top less than 1 line long; corolla perfect but unexpanded, white; calyx shorter than corolla, grey, lobes sub-acute with red margins, and a red central line; capsule $\frac{2}{10}$ in. long, slender, glabrous, green, scarcely tetragonal; peduncle $\frac{6}{10}$ in. long, thickly puberulent with short white curved hairs.

Hab. Among other low herbage (as *Nertera*, *Utricularia*, *Hydrocotyle*, &c.); marshy spots, high land base of Mount Tongariro, Taupo district; January, 1893: *Mr. H. Hill.* (Received in living tufts, as dug up.)

Obs. Of this little plant I have only obtained two specimens, both alike in size, &c., but one only bearing a flower. The regular shape of their small narrow leaves, and their strictly-erect growth, the simple stem without any basal branches, or root-stock buds, serve to mark it as being distinct from the other small indigenous species

775 *Epilobium alsinoides* subsp. *tenuipes* (Hook.f.) P.H.Raven & Engelhorn.

of this genus, which [316] are creeping plants with round leaves. The puberulous lines on their lower stems are excessively minute, and can only be detected with a strong lens. The curved close hairs on the peduncle are a curious and pleasing object. More specimens are a desideratum.

Order XXXIX. COMPOSITÆ.

Genus 17. *Senecio*, Linn.

1. *S. dimorphocarpos*,⁷⁷⁶ sp. nov.

Plant perennial, herbaceous, glabrous (*primâ facie*), but with a few slightly-scattered weak woolly hairs. Main stems stout, erect, 2 ft.–3 ft. high, 3–4 lines diameter, striate, purple. Leaves basal (root-stock), subrosulate, spreading, obovate-spathulate, 5½ in. long (including petiole), 1¼ in. broad, deeply pinnatifid, lobes cut bluntly lacinate and crisped adnate (*sursum currens*), the lowermost very small, almost pinnate; petiole 1½ in.–2 in. long, narrowed, deeply sulcate, succulent; caudine, on main stems, numerous, alternate 6–12 lines distant, thin, obovate, much tapering, tip broad, 12 in. long, 3 in.–4 in. wide near top, sub-lyrate-pinnate; segments large and close above on rhachis, small and very distant below, irregularly and deeply lacinate-lobed (subpinnatifid), lobes distantly and bluntly toothed, decreasing rapidly in size downwards and very small near base, dark-green above paler beneath, slightly hairy; hairs short, weak, and scattered, woolly on veins; veins few filiform and

776 *Senecio jacobaea* L.

prominent; the young immature leaves densely woolly; scurfy on undersurface; midrib (or rhachis) narrow; petiole (or lowest rhachis) 1 in.–2 in. long, slender, slightly expanding and subamplexicaul at base; leaves on branches, distant, oblong, elliptic, much more narrowly cut, laciniate, flaccid, spreading, 3 in.–5 in. long, 2 in.–2½ in. broad, decreasing in size upwards and extending to bases of panicle branches. Flower-heads rather large, 10–11 lines diameter, numerous in a loose terminal irregular many-branched subcorymbose panicle 4 in. wide; branchlets long, dichotomous, and very slender; peduncles about 1 in. long, slender, striate, single and two together, finely and slightly downy, each having 4–6 scattered long linear bracteoles. Involucre cup-shaped or suburceolate, glossy within, the bracts 13 cut to base, 1½ lines long and ½ line wide, imbricate, suboblong-ovate, acuminate, green with wide membranous white margins, prominently 2-nerved; nerves dark-green; tips acute, dark-brown-purple, very hairy and ciliolate with a few (5–8) scattered linear (almost filiform) bracteoles at base, their tips very acute and coloured like those of involucre. *Ray-florets* generally 13, ligula (without the tube) 3½ lines long, linear-lanceolate obtuse with a single notch at tip, [317] bright-yellow, spreading (but revolute in age), 4-veined; the tube exceedingly slender, roughish subscaberulous. *Disk florets* numerous, darker yellow, scarcely exceeding the involucre, the tube infundibuliform subangular, 5-nerved; nerves dark-coloured; style long, hairy, lobes large, stout, much arched, tips truncate and finely penicillate; anthers tailed, obtuse, slightly and sparingly roughish subtuberculate, enlarged (tumid) at base. Achenes pale linear subterete—

of *ray* glabrous, truncate at both ends, slightly curved and more cylindrical than those of *disk*; of *disk*, hairy, striate, slightly tapering, thickest at top. Pappus white—of *disk* numerous, straight, barbed, acute, shorter than floret; of *ray* few (4–6) smaller flexuous and weaker. Receptacle subhemispherical, alveolate, the ridges minutely toothed.

Hab. In gullies, Kaweka Mountain-range, County of Hawke's Bay; 1892: *Mr. F. W.C. Sturm.*

Obs. I. A fine-looking plant, having affinity with *S. latifolius*, Hook. fil., though differing in several important characters; and in its two forms of achenes, &c., with *S. jacobaea*, Linn., a British and European species, which evidently belongs to the same natural section.

II. I have received some large and good specimens of this plant from its kind discoverer, but not a complete plant, so I do not know its root-stock, neither if it is much branched at the root; I have, however, a fine young plant in my garden.

2. *S. areolatus*,⁷⁷⁷ sp. nov.

Plant herbaceous, erect 15 in.–18 in. high(?), glandular, hairy, with more or less of white scurf. Main stems 12 in.–14 in. long, slender, striate, having 4–5 distant branches at top, each with a long leaf at base. Leaves (cauline) few, distant about 2 in. apart on main stems, membranous, dark-green, 2 in.–3 in. long, subobovate in outline, irregularly and deeply pinnatifid, narrowed into a petiole, sessile and stem-clasping, base much dilated and

777 *Senecio sylvaticus* L.

lobed, auricles toothed, lobes few long narrow acuminate, margins thickened and distantly toothed; teeth indurated, black; veinlets numerous, closely and compoundly anastomosing. Flower-heads rather small, in a loose, spreading, subcorymbose panicle; subpanicles 3 in.—4 in. long, very slender, dichotomous, with a single long leaf at bases; peduncles about 2 in. long, filiform, each bearing 6–10 heads on capillary pedicels 3–4 lines long. Involucre cylindrical 4-lines long, a little shorter than florets and pappus, green, scabrid, about 15 linear acuminate bracts, tips acute, irregular in width, with white membranous margins, 1–2 nerved; nerves pale, prominent, with a few long, narrow, scattered bracteoles below. Florets very slender, tubes capillary—of *ray*, few, sub 12, ligula yellow, very small, much [318] revolute, 4-nerved; of *disk*, numerous, about 60, bell-mouthed, 5-cleft, segments erect, subacute. Receptacle pitted, alveolar ridges somewhat regularly and acutely toothed. Pappus numerous, white, soft, slightly scabrid. Achene narrowly oblong, striate, contracted under pappus, edges strigillose-pubescent; tip obtuse, with a central capillary point. Arms of style long and much arched, tips terete, thickened.

Hab. High hills, eastern slopes of Ruahine Mountain-range, west of Woodville, County of Waipawa; 1893:
Mr. H. Hill.

Obs. I have received only flowering-stems (three) of this plant, roughly and hastily gathered; their cauline leaves, being tender, bruised and much broken, so that allowance must be made for their description: their thickly anastomosing veins, together with the peculiar strigillose

pubescence of the achenia and the general glandular pubescence of the plant, afford good characters. It has much the appearance of an *Erechtites*, and at first sight I had supposed it to belong to that small genus.

Order XL. STYLIDIEÆ.

Genus 2. *Helophyllum*, Hook.f.

1. *H. muscoides*,⁷⁷⁸ sp. nov.

Plant low cæspitose compact, spreading, forming pretty large mat-like patches. Branches $1\frac{1}{2}$ in. long, each bearing 2–3–4 small branchlets about $\frac{1}{2}$ in. long at top, their tops being nearly equal. Leaves closely imbricated all round stems, glabrous, linear, semi-terete, thick, $1\frac{1}{2}$ lines long, $\frac{1}{25}$ in. broad, wider and flatter at base, which is also white and glossy; apex obtuse, slightly spatulate and knobbed, brownish-yellow and orange, the young leaves bright-green. Flower solitary on tip of branchlet, white, star-like; calyx 6 linear lobes, obtuse, length of tube, glabrous; corolla 6-parted, segments oblong, obtuse, distant, each 1 line long, equal, spreading flat on leaves; style erect, much exserted, white; stigma penicillate, with 2 small pale-coloured anthers underneath, adpressed.

Hab. Tongariro Mountain, Taupo; 1893: *Mr. H. Hill.*

Obs. A species near to *H. colensoi*, Hook.f., but with very much smaller and differently-shaped leaves. All the flowers I have seen (nearly a dozen) were 6-lobed and regular.

778 *Phyllachne colensoi* (Hook.f.) Berggr.

Order LV. LENTIBULARIEÆ.

Genus 1. Utricularia, Linn.

1. *U. vulcanica*,⁷⁷⁹ sp. nov.

Scape simple, erect, filiform, 1½ in.–2 in. high; 1-flowered (one specimen 2-flowered), purplish-brown, glabrous, 4 simple bracteoles sublinear obtuse, narrowest at tips adpressed in a [319] semi-whorl 1 line below flower; capillary rootlets very fine. Leaves 2 (or 3) at base, narrow linear-spathulate, obtuse, ½ in.–1 in. long, $\frac{1}{25}$ in. (or less) wide, 1-nerved, weak, spreading; petiole long and very narrow. Calyx sepals unequal, cut to base, suborbicular concave, purplish-green, shining, veined; veins simple; margins undulate, whitish; the tip of the smaller segment emarginate. Corolla yellowish(?) with purple veins 3 lines diameter, upper lip subovate obtuse; the lower lip sub-3-lobed spreading; spur ascending transversely obtuse; anthers large, suborbicular, purple; style short, stout; stigma linear, brown. Capsule globose, $\frac{1}{10}$ in. diameter, very membranous, shining. Seed small, pale, oblong, shining, tips rounded, base narrower truncate, sides straight.

Obs. This little plant is allied to *U. subsimilis*, mihi⁷⁸⁰ (also detected in similar situations in the interior Taupo country at a lower altitude), but differing in size, in form and colour of corolla, &c.; better specimens are, however, much wanted. I received from Mr. Hill a large number of specimens, but they were all more or less

779 *Utricularia dichotoma* Labill.

780 WC: Trans. N.Z. Inst., vol. xvi., p. 334.

damaged through having been closely packed, as they were collected in little wet turfy tufts with other small plants. One character, however, was common to them all—that of size and height.

CLASS II. MONOCOTYLEDONS.

Order I. ORCHIDÆ.

Genus 3. *Bolbophyllum*, Thouars.

1. *B. ichthyostomum*,⁷⁸¹ sp. nov.

Plant small, epiphytal, prostrate, creeping, densely matted. Stems slender, 3 in.—5 in. long, tortuous, dry, whitish, longitudinally striate, emitting many thickish terete succulent white rootlets, their tips obtuse. Pseudo-bulbs on upper side of stems $\frac{1}{3}$ in.— $\frac{1}{2}$ in. apart, sessile, ovoid, $\frac{1}{6}$ in. long and sub-globular, $\frac{1}{10}$ in. diameter, wrinkled, glabrous, shining, pale-green. Leaves, 1 to each bulb at top, with a narrow circular sheath at base, oblong and oblong-ovate (sometimes oblong-lanceolate), tip obtuse, sometimes slightly retuse, $1\frac{1}{2}$ —2 lines long, deeply sulcate, thickish, slightly recurved, minutely and regularly rough-dotted-hairy above, and with minute microscopical circular dots below, obsoletely parallel-nerved, 3 nerves on each side of midrib visible between the eye and light; margins closely ciliolate with coarse, stiff, patent, obtuse hairs, petiolate; petioles short, $\frac{1}{20}$ in. long, stout, glabrous. Flowers very small, few, solitary, scattered, white; peduncle arising from under bulb, stout, erect, 2 lines long, with a simple sheathing scarious bract

781 *Ichthyostomum pygmaeum* (Sm.) D.L.Jones, M.A.Clem. & Molloy.

near the top; perianth [320] (*post anthesin*) adhering to tip of upper valve of ovary (marcescent), expanded about 1 line diameter; sepals and petals ovate-deltoid obtuse, silvery-shining, very membranous; ovary large, subobovoid, gibbous, 2 lines long, yellow, thickly glandular-echinate (as, also, top of peduncle above bract), bivalved; valves gaping, but not to base largely concave, dis similar, broad, $\frac{1}{10}$ in. diameter, obtuse; margins undulate uneven, thickened; the upper and larger valve with 2 lateral nerves; the lower 1 central one. Seeds very minute, sub-fusiform, thin, white, scarious.

Hab. On trunks of trees, forest near Kumeroa, River Manawatu, County of Waipawa; May, 1893: *Mr. H. Hill.*

Obs. I. This interesting little plant is allied to *B. pygmæum*, Lind., which *prima facie* it closely resembles, differing largely, however, on close examination, particularly in its glandular-echinate ovary and leaf. It is also a still smaller species. The ripe capsule gaping so curiously at its sutures, somewhat resembling the open mouth of a fish, is the cause of its specific name.

II. Although I received a large patch, or mat, of the plant (about 4 in.—5 in. each way), I only detected 6–7 pale-yellow capsules, all alike in size and form, and broadly gaping, and each bearing its minute withered flower, the plant being long past flowering, so that all allowance must be made for the imperfect description of the perianth. The microscopic seeds were also plentifully shed, scattered like dust over the neighbouring plants. Perfect flowers are much desired.

1893 List of Fungi recently collected in the Bush District, County of Waipawa; being a Further Contribution to the Indigenous Flora of New Zealand. *Transactions of the New Zealand Institute* 26: 320-323.

[Read before the Hawke's Bay Philosophical Institute, 9th October, 1893.]

AGAIN, in January last, I despatched to the Director of the Royal Botanic Gardens, Kew, London, another lot of *Fungi* that I had gathered at various times during the preceding winter and spring in the forest country near to Dannevirke. This parcel contained 175 separate packets. I have lately received from Kew the list of the same examined and named, from which it appears that several of them were fresh duplicates of specimens formerly sent; others were in triplicate (some of them being perennial, and, being also in different stages of growth, presented various forms and appearances); [321] while not a few, obtained in winter, were merely in a state of mycelium, and others imperfect or sterile, of which better specimens are wanted. Those that have been determined and are new to our New Zealand flora are here given (some of them I know belong to the Australian and Tasmanian floras), and only one specimen out of the whole lot is a true *species nova*.

FUNGI.

§ I. FOREIGN FUNGI ALREADY DESCRIBED, BUT NOT BEFORE FOUND IN NEW ZEALAND.

Of Genera known to inhabit New Zealand.

Genus 1.⁷⁸² AGARICUS, Linn.

1. A. (Clitocybe) velutipes, *Fr.*
2. A. (Mycena) filipes, *Fr.*
3. A. (Pleurotus) mitis, *Fr.*
4. A. (Pleurotus) porrigens, *Fr.*
5. A. (Pleurotus) depluens, *Fr.*
6. A. (Pholiota) squarrosus, *Müll.*
7. A. (Flammula) inopus, *Fr.*
8. A. (Flammula) marginatus, *Fr.*
9. A. (Naucoria) sideroides, *Fr.*
10. A. (Tubaria) furfuraceus, *Fr.*

Genus 4. MARASMIUS, Fries.

1. M. insititius, *Fr.*

Genus 10.⁷⁸³ POLYPORUS, Fries.

FOMES, *Fries.*

1. F. microporus, *Fr.*

POLYSTICTUS, *Fries.*

1. P. vulgaris, *Fr.*

Genus 12. FAVOLUS, Fries.

1. F. squamiger, *B.*

782 WC: The numbers attached to the genera are those of the same in the "Handbook of the New Zealand Flora."

783 WC: This genus is now separated into four genera—Polyporus, Fomes, Polystictus, and Poria—but in Hooker's work all are included under Polyporus.

Genus 13. HYDNUM, *Linn.*

1. *H. molluscum, Fr.*

Genus 16. STEREUM, *Fries.*

1. *S. spadiceum, Fr.*

Genus 17. CORTICIUM, *Fries.*

1. *C. sebaceum, Fr.*
2. *C. violaceo-lividum, Fr.*
3. *C. molle, Fr.*
4. *C. ceraceum, Fr. [322]*

Genus 19. GUEPINIA, *Fries.*

1. *G. flabellata, Fr.*

Genus 30. LYCOPERDON, *Tournefort.*

1. *L. colensoi, C. and M.*

Genus 68. HYPOCREA, *Fries.*

1. *H. carnea, B. and C.*
2. *H. sulphurella, K. and C.*

DACRYOMYCES,⁷⁸⁴ *Nees.*

1. *D. stillatus, Fr.*

LACHNEA, *Fries.*

1. *L. scutellata, Fr.*
2. *L. erinacea, Sw.*

LAMPRODERMA, *B.*

1. *L. echinulata, Rost.*

TRICHIA, *Hall.*

784 WC: This genus, with the three following ones, are not in Hooker's "Handbook of the New Zealand Flora," but are in Trans. N.Z. Inst., vols. xix., xxii., and xxiii.

1. T. chrysosperma, *Rost.*

Of Genera new to New Zealand.

BADHAMIA, *Berk.*

1. B. hyalina, *Fr.*

AURICULARIA, *Bull.*

1. A. lobata, *Fr.*

TORULA, *Pers.*

1. T. velutina, *Preuss.*

§ II. SPECIES WHOLLY NEW TO SCIENCE.

HYMENOBOLUS.

1. H. atro-fuscus, *Masse, n. sp.*

And here I think I may again remark on the two striking facts further indicated by this list:—

1. The large number of *Fungi* here in New Zealand that are identical as to both genera and species with those of European and other countries; as shown also by the list originally published by Sir J.D. Hooker in his "Handbook of the New Zealand Flora," as well as in my former lists of *species novæ*, and of known species since detected in New Zealand, given in several of the later volumes of the "Transactions of the New Zealand Institute."⁷⁸⁵

2. The small number of truly indigenous (endemic) *species novæ*. [323]

785 WC: Trans. N.Z. Inst., vol. xvii., p. 266; and also vol. xix., p. 311.

At the same time I should state that nearly all that I have been able to collect during several years were obtained from almost the same localities repeatedly gleaned, comprised within a wooded area of, say, twenty miles, between Norsewood and Tahoraiti. My own belief, founded on practical experience, is that the number of *Fungi* will be yet greatly increased in years to come, while at the same time, I fear, many species (besides numerous others, *species novæ*, of the more graceful and symmetrical cryptogamic orders—*Musci*, *Hepaticæ*, and *Lichenes*) will become irrecoverably lost to science through the persistent clearing and destroying of the virgin forests, their peculiar habitats.

**1893 Notes, Remarks, and Reminiscences of
Two Peculiar Introduced and Naturalised
South American Plants.**

Transactions of the New Zealand Institute 26: 323-332.

[*Read before the Hawke's Bay Philosophical Institute,
10th July, 1893.*]

Extremes in Nature equal good produce;
Extremes in man concur to general use.

POPE: *Moral Essays.*

————— find
A tale in every thing.

WORDSWORTH: *Simon Lee.*

1. The AMERICAN ALOE = *Agave americana*, Linn.

IN passing lately through the Town of Waipawa, my attention was drawn towards an American aloe that had flowered during the past summer in a garden there; the tall withered flowering-stem was still standing erect, and the parent plant had its usual large number of young ones (suckers, offshoots) nestling around it; but these, amounting to nearly twenty, presented the uncommon and peculiar appearance of all bearing flowering-stems about 3 ft. high, each having many flowers (several dozen) similar in size, colour, disposition, and show to those of the parent plant. As I had never before noticed this phenomenon, and had frequently seen and closely watched several specimens of these plants in flower, in

my own gardens and in those of others, both at the warmer climate of the north (Bay of Islands) and here in Napier, I have deemed this event worthy of recording. And as the real value of this huge and striking plant is, very likely, but little known—especially to our rising generation—perhaps, also, to some of my audience, who may have seen it after flowering, here in Napier, chopped up and cast out and carted away, a few words concerning its uses may not be out of place. [324]

Its native home (as its specific name imports) is America; there in equinoctial America the plant is very common, from the plains even to 9,000 ft. altitude, where it is useful as impenetrable hedges with its hard, big, and spiny leaves. In Mexico it has also been cultivated from time immemorial, under the names of *Maguey* or *Metl*, in order to obtain a kind of wine, called *pulque* by the Spaniards, made from the inner leaves just before its flowering-stem is developed. Humboldt has given a full account of its culture. The juice is said to be of a very agreeable sour taste; it easily ferments, on account of the mucilage and sugar it contains. This beverage, which somewhat resembles cider, has, however, an odour of putrid meat, extremely disagreeable. But the Europeans who have been able to get over the aversion which the fetid odour inspires prefer the *pulque* to every other liquor. A very intoxicating brandy is formed from the *pulque*, which is called *mexical*, or *aguardiente de maguey*. The Government drew from the *Agave* juice a nett revenue of £166,497 in three cities (*Royle*).⁷⁸⁶

786 WC: "Before the Revolution, the duties on the pulque formed so important a branch of revenue that the cities of Mexico, Puebla,

Its fibre, and that of some allied species, especially the *Pita* (thread) plant, is extremely tough, and forms excellent cordage; this is separated by bruising and steeping in water and afterwards beating, and is obtained from the roots as well as the leaves. The ancient Mexicans also made their paper of *Agave* leaves laid in layers.⁷⁸⁷ Its root is diuretic and antisyphilitic, [325] and is even brought to Europe mixed with sarsaparilla. It is also stated by Long, in his "History of Jamaica," that the

and Toluca alone paid \$817,739 to Government."—(Humboldt: "Essai Politique," tom. ii., p. 47).

787 WC: "Their manuscripts were made of different materials—of cotton-cloth, or of skins nicely prepared; of a composition of silk and gum; but for the most part of a fine fabric from the leaves of the aloe (*Agave americana*), which grows luxuriantly over the tablelands of Mexico. A sort of paper was made from it resembling somewhat the Egyptian papyrus, which, when properly dressed and polished, is said to have been more soft and beautiful than parchment. Some of the specimens still existing exhibit their original freshness, and the paintings on them retain their brilliancy of colours."—(Prescott, Hist. Conquest of Mexico, b. i., ch. 4.)

[Footnote] Again, he says: "The miracle of nature was the great Mexican aloe, or maguey. As already noticed, its bruised leaves afforded a paste from which paper was manufactured; its juice was fermented into an intoxicating beverage (pulque), of which the natives to this day are excessively fond. Its leaves further supplied an impenetrable thatch for the more humble dwellings. Thread, of which coarse stuffs were made, and strong cords, were drawn from its tough and twisted fibres. Pins and needles were made of the thorns at the extremity of its leaves; and the root, when properly cooked, was converted into a palatable and nutritious food. The *Agave*, in short, was meat, drink, clothing, and writing materials for the Aztec. Surely never did nature enclose in so compact a form so many of the elements of human comfort and civilisation."—(Loc. cit., ch. 5.)

expressed juice of the leaves evaporated is useful as a substitute for soap; and Lindley says, “*Agave saponaria* is powerful detergent: its roots are employed in Mexico as a substitute for soap.” It was early introduced into Jamaica, Antigua, Dominica, and Cuba, and also into the countries bordering on the Mediterranean, where it is become very common.

I have known its thick fleshy juicy leaves to be successfully used for rheumatism, particularly lumbago: their rind taken off, and the large fresh wet slab rubbed on the parts affected. It seemed to possess a similar power on the skin to that of hartshorn or turpentine liniments. In one instance the fresh leaf was used (as above) with beneficial effects in lumbago here in my own house, by my manservant.

I remember, several years ago, the flowering of a plant in the Botanic Gardens at Kew caused some excitement, from the gardeners’ fable respecting it—that “it flowered only once in a hundred years,” and from it being the *first* that had flowered in England; and, as it was under glass, a proportionately high turret had to be built up for its tall flowering-stem, which grew rapidly, and caused the turret to be several times enlarged to keep pace with it.

The plant, however, flourished well in the open air in the West of England, where I have seen several. I remember two old and very large plants in my maternal grandfather’s gardens in Penzance (A.D. 1814–1819), but they had not flowered when I last saw them, and were shortly after dug up and destroyed, the ground being required for other purposes.

It was an interesting and unique sight to observe on a calm summer's evening, in my garden in the Bay of Islands, the large moths (*Protoparce distans*) in great numbers flying around the flowers of the *Agave americana*, extracting their honey with their long proboscis, as, the flowers being situated high up on their tall pole-like flowering-stem, the operations of the moths were seen to advantage against the clear sky; the plant itself also being an exotic, and its large flowers never before known to them, made it the more interesting. Moreover, what further served to increase the pleasure of observing this winged army of big moths diligently at work was their peculiar manner of carrying it on, never, like bees, and other smaller *Lepidoptera*, lighting on a flower, but while on the wing rapidly uncoiling their slender proboscis, and thrusting them deep into the *Agave* flowers, their wings at the same time quickly vibrating and causing a low humming [326] noise that was not unpleasant.⁷⁸⁸ I have watched them steadily for half an hour, and longer, and have never found one of them to light on the flower, or the plant itself, to rest.

788 WC: I had also often observed them dexterously performing the same kind of feat with the flowers of the common honeysuckle (*Lonicera periclymenum*, L.), only in this latter case the tube of the honeysuckle is much more slender. At such times, too, I should be quietly seated on a low chair, with the woodbine spreading thickly around me, while of my presence the moths seemed to take no notice, in their eagerness to collect their food.

2. The PRICKLY PEAR = *Opuntia ficus-indica*, or Indian Fig.

This fleshy plant of the *Cactus* family, which produces the fruit known in the south of Europe as the Indian fig, has no connections with the fig-tree, nor has the fruit with the fig. Its origin is not Indian, but American; everything is erroneous and absurd in this common name. (Just as in the case with the former plant, *Agave*, which is no true aloe, neither does it belong to the same order with the aloes.) However, since Linneus took his botanical name from it = *Cactus ficus-indica*, afterwards connected with the genus *Opuntia*, it was necessary to retain the specific name to avoid changes which are a source of confusion, and to recall the popular denomination.

This plant is well known in Napier, as well as in other places in New Zealand, it having been early introduced (long before this country became a British colony). It does not, however, perfect its fruit here with us, although it does plentifully at the north (Bay of Islands, &c.), the climate there being warmer, and more suited to it.⁷⁸⁹ My

789 WC: I may here give a little anecdote concerning the edible use of its fruit here in New Zealand. It was in the winter season of 1842 when the Antarctic Expedition ("Erebus" and "Terror"), under Sir James Ross, was at anchor (wintering) in the Bay of Islands. One fine day Dr. (now Sir J. D.) Hooker was on shore at Paihia, the Church Mission station, where Dr. Andrew Sinclair, R.N. (afterwards Colonial Secretary), was then residing, and I joined them. We soon concluded to go across to Waitangi (where the treaty had been signed), about a mile and a half distant, in my boat. On arriving there we strolled into the garden of the owner and late occupier (Mr. Busby), and there on its raised boundary were several large plants of the prickly pear, growing profusely and bearing much ripe fruit. Dr. Sinclair, who had been in South

chief reason, however, for bringing it forward in this paper is to show the extraordinary uses made of it, and of other closely-allied species⁷⁹⁰ in their native homes in South America; and that [327] too as valuable forage-plants for both sheep and large cattle. And this use (as I take it) will be the more interesting to our sheep-and cattle-breeders here in Hawke's Bay and elsewhere when it is remembered by them what a prodigious outcry was raised some twenty-five years ago when the large and common thistle (*Cnicus* sp.); then lately introduced, was becoming exceedingly plentiful, causing some of our early settlers to view its rapidly overrunning the country with dismay, fearing the certain starvation of their flocks and herds. Our Provincial Council (of which I was a member) was literally besieged with urgent applications to pass immediate stringent laws for the suppression of "vicious thistles"; but, fortunately for Hawke's Bay, the majority in the said Provincial Council, after much debating, determined *not* to do so. And afterwards, in not a few instances, in times of drought, those very doomed and maligned thistles *saved their flocks*. All Provincial Councils in the colony, however, did not act so prudently, and therefore much of bitterness and grief and lawsuits, and consequent "costs," followed. In many

America, was delighted at the sight (fruit being scarce at that season in the Bay), and soon commenced gathering and eating the "figs," to our (or, at least, to my) great astonishment, as I had never seen them eaten before. I scarcely need add that we two speedily joined him.

790 WC: Upwards of forty species have been described, though with some botanists several of them are deemed to be merely varieties.

places where the thistles once completely covered the ground there is not one now to be seen.

This plant (the *Opuntia*) existed both wild and cultivated in Mexico before the arrival of the Spaniards (A.D. 1518). Fernandez described nine varieties of it, which shows the antiquity of its cultivation. The famous cochineal insect feeds on one of them especially, and it has been transported with the plant to the Canary Islands and elsewhere. It was one of the first plants which the Spaniards introduced to the Old World, both in Europe and Asia; and the plant soon became naturalised in the South of Europe and in Africa. In Spain it bore its American name of *tuna*; while the Moors, who took it into Barbary when they were expelled from the peninsula, called it "fig of the Christians." The custom of using the plant for living fences,⁷⁹¹ and the nourishing property of the fruits, which contain a large proportion of sugar, have determined its extension round the Mediterannean. The fruit is very similar in its properties to that of currants, in some being refreshing and agreeable to the taste, in others mucilaginous and insipid. Many are valued as palliatives of intermittent and bilious fevers, in consequence of their refreshing sub-acid juice. The fruit of *O. tuna* is of the richest carmine, and forms a valuable pigment, employed at Naples as a water-colour.

[328]

791 WC: Of *Opuntia tuna* it is recorded: "This kind of Indian fig makes strong living fences. When the Island of St. Christopher (West Indies) was to be divided between the English and the French three rows of the tuna were planted by common consent between the boundaries."—(Sloane.)

In this country, as in England, we scarcely know the Indian fig except as succulent ugly sprawling shrubs without leaves; but some species have leaves of an ordinary description, and when old the columnar species form wood of considerable strength. Humboldt speaks of a forest of such plants, not mere herbaceous species, but tall trees, with stems yielding wood suitable for domestic purposes. And Darwin states that in Central Chili "the cactuses, or, rather, *Opuntias*, were very numerous. I measured one," he says, "of a spherical figure, which, including the spines, was 6 ft. 4 in. in circumference. The height of the common branching kind is from 12 ft. to 15 ft., and the girth with spines of the branches between 3 ft. and 4 ft." ("Naturalist's Voyage"). Further on in his admirable book he says, "A species of large tree *Cactus* was one of the principal kinds of food of the great land-tortoise in the Galapagos." His account of both—the huge reptile, and the plant, its food—is exceedingly interesting.

There is no reason for supposing that the modern *Opuntia* is described by Theophrastus, as the German botanist Sprengel asserted. The account given by the former writer, as far as we know, rather suits some tree like *Ficus religiosa*. Hot dry exposed places are the favourite homes of the Indian figs, for which they are naturally adapted in consequence of the imperfect evaporating pores of their skin, a circumstance which, as De Candolle has shown, accounts for the excessively succulent state of their tissue.

In some recent valuable publications by the Department of Agriculture of the United States Government, "On the

Grasses and the Forage-plants for Cultivation in the South," I find several practical statements both important and curious respecting this plant and its allied species and their uses for forage, in letters and communications from extensive and practical cattle-breeders in several of the Southern States—viz., Texas, Mobile, New Mexico, and California—and, as they are also very extraordinary, I shall quote a few of them verbatim. These, however, are prefaced by some humane and able remarks from the Department of Agriculture, U.S., which I also extract:—

"A number of species of *Cactus*, mainly of the genus *Opuntia*, and commonly called nopal, or prickly pear, are used as food for cattle and sheep in the dry regions of Texas, and westward, where the ordinary forage-plants fail. In the natural state cattle do not often touch it, unless driven by hunger, except while the new growth is young and tender. Sheep eat it without preparation more readily than cattle, and for them the plants are sometimes merely cut down so as to be within reach. More often the herder passes along and clips off a portion of each flat joint, so that the sheep can [329] enter, their noses without coming in contact with the spines. For cattle it is customary to singe off the spines over a brisk blaze.

"Considering the extent to which these plants are eaten by stock, even in their natural state, it is remarkable that so few evil effects have been observed. A large majority of those who have mentioned their use state that no injurious results have come to their notice.

"A sufficient number of instances of injury are reported, however, to show that compelling stock to eat them unprepared is cruel, if not unprofitable, and to render it

probable that the suffering and loss on this account have not been full observed. A number of instances are reported of cattle having died from the accumulation of the spines in the mouth and stomach. The jaws and neck sometimes become swollen and inflamed from the presence of the spines. The tongue has been known to become so filled with them as to be rendered unfit for food. How this amount of injury can occur and not affect the growth of the animal it is difficult to see. The injury to sheep is mostly confined to the nose and lips, and is not considered very serious, ‘as the needles soon fester and come out.’

“The succulent nature of the plant in the growing-season sometimes has too great a laxative effect, but if other fodder is fed with it this tendency is rather beneficial than otherwise. Notwithstanding these difficulties, however, the *Cactus*, when properly prepared, is a valuable fodder-plant, and is destined to come into more general use in the warm, arid parts of the country.”—(*Bulletin*, No. 3, p. 50.)

J.A. AVENT, Bexar County, Southern Texas:—

“I have been feeding prickly pear for thirty years. It is an excellent food for cattle if fed with fodder or hay of any kind. When not too full of sap it may be fed alone. There is nothing that cattle like better than prickly pear when accustomed to it. The old stumps, with a little corn, will fatten cattle very fast. We burn off the thorns in feeding it, but most stock-raisers do not. The apples ripen about the 1st July, and are eaten by almost everything. Hogs get fat enough upon them to render into lard when the crop is good, and it seldom fails.”

A.J. Spencer, Uvalde, Texas:—

“It is eaten by cattle, sheep, goats, and hogs. They eat it mainly as found in the range, though sometimes the thorns are scorched off. It is considered one of the best native forage-plants. It is a partial substitute for water for all stock that eat it. The only injury I have known to result from eating it has been to sheep, and then only when eaten while frozen.” [330]

Professor George W. Curtis, College Station, Texas:—

“It is used quite extensively for cattle and sheep. The prickles are singed off, or the whole plant is boiled and fed mixed with bran.

“Has your attention been called to the use of the prickly pear as a lubricant?—Certain of the western railroads have used it with excellent results. It is gathered in Texas, shipped to Saint Louis, ground up coarsely, and pine tar added to keep the albuminoids from decomposition (I do not know whether anything else is added or not), after which it is barrelled and returned. The total cost is 2½ cents per pound, and it is said to do the work of 5 or 6 cents worth of grease and rags formerly used. It is especially useful in preventing and cooling hot boxes. If this comes into general use it will open a new field of production.”

Dr. A.E. Carothers, Cotulla, La Salle:—

“I have fed 400 beeves, and am now feeding 800 more on this food. From the analysis furnished by Mr. Richardson, of your [Government] department, I found that the *Cactus* was deficient in albuminoids, and, from the well-known richness of the cotton-seed oil-cakes in

those elements, I selected it to supply the deficiency, which it did very well.... I feed per head about 60 lb. of the *Cactus* and an average of about 6 lb. of the meal per day for ninety days. A train-load of 330 head of these cattle sold last week in Chicago at 4½ cents. The meat is singularly juicy and tender, the fat well distributed among the muscles. I have sold it at 1 cent per pound gross over grass-cattle in San Antonio.”

Edward Beaumont, Jemes, New Mexico:—

“The *Cactus* is not used here to any great extent, but it makes good food for horned cattle, especially cows. The thorns are scorched off over a blaze of brush or straw. When cattle get used to eating it they come running as soon as they see a smoke.”

O.F. Wright, Temescal, San Bernadine County, California:—

“Many kinds of *Cactus* grow here. The flat kind, or prickly pear, is abundant in places. Cattle, goats, and sheep eat it sometimes without any preparation when very hungry; but it looks as though needles and pins would be a pleasanter and safer diet. I have never known, however, any bad results to come from eating it. After boiling to soften the thorns it makes good food for milch cows, and is much relished. The trouble of boiling prevents its extensive use.”

I may also mention another introduced plant (a common British weed here in Napier) as being extensively used and [331] valued as a forage-plant in some of those Southern States, and this relation will also, I think, surprise many of our settlers.

3. ERODIUM CICUTARIUM = *Alfileria* (in America),
Hemlock-leaved Heron's-bill (commonly called a
Geranium).

This plant is one of the commonest of our British introduced weeds, being found everywhere, even in the streets and roads of Napier, and, being perennial and a quick grower, lining the kerbs and the bases of houses. No doubt it is well known.

It shows itself of very different sizes. Sometimes its leaves are only 2 in. or so long, and sometimes 8 in.—9 in., but all alike; at first radiate and symmetrical from its root-stock, flat on the ground, it often presents a very neat and striking appearance.

In my own grass-paddocks and pathways it has long been very common; and at first, while I could not but admire its graceful form, I feared it would prove to be another unwelcome imported weed; but I have found horses to feed well on it, intermixed with grasses and clovers. So that from observation I have concluded that not only this but other foreign plants (commonly called "weeds" by us) are really of more service to stock generally than we are aware of, when growing together with grasses and clovers; and, indeed, are naturally better adapted to keep them in health than when fed on rye-grass and clovers alone. Notwithstanding, I was surprised to find this plant (*Erodium cicutarium*) so highly valued as a forage-plant in the Southern States of America. As before, I give a few quotations respecting it:—

"It occurs abundantly, and is of much value for pasture, over a large extent of territory in Northern California and adjoining regions. A few have begun its artificial

propagation, and it is undoubtedly worthy of introduction into other regions in the south and west having prolonged droughts.—(*Loc. cit.*, p. 34.)

Professor E.W. Hilgard, in the report of the Department of Agriculture of California, says,—

“Two species of crane’s-bill (*Erodium cicutarium* and *moschatum*) are even more common here than in Southern Europe, and the first-named is esteemed as one of the most important natural pasture-plants, being about the only green thing available to stock throughout the dry season, and eagerly cropped by them at all times. Its Spanish name of *Alfilerilla* (signifying a pin, and now frequently translated into ‘pin-weed’) shows that it is an old citizen, even if possibly a naturalised one.” [332]

O.F. Thornton, Phoenix, Maricopa County, Arizona:—

“It is not cultivated, but is rapidly spreading on the dry ranges—*i.e.*, valleys and mountain-sides—and is one of the very best wild grasses, either green or dry.”

J.C. Tiffany, San Marcial, Socorro County, New Mexico:—

“There is very little in this county; what there is has been brought in the wool of sheep from California. It grows well in uplands or low, and is spreading rapidly. It is excellent feed—one of the very best. I am trying to get a large quantity of the seed to sow on my ranges. Can you inform me how it may be obtained? I would scatter it in localities over 20,000 acres if I could get the seed at a reasonable cost.”

And now let us hear a few words from the opposite side—again exemplifying the wide difference between practical knowledge and theoretical fireside speculation:—

Dr. A. Gattinger, Nashville, Tenn.:—

“It is not known here, but I have seen it in Germany. It is a vile weed, and ought not to be introduced into cultivation. I cannot understand how such a thing can be seriously spoken of when so many really good native plants are totally ignored.”—(*Loc. cit.*, p. 36.)

In conclusion, I would observe that I had several objects in view in writing this paper; particularly,—

1. To bring to notice the remarkable abnormal early flowering of the young offshoots of *Agave*.
2. To show the many great and beneficial uses made of that plant, and of another equally strange-looking one, by ancient as well as by modern races of men.
3. To call particular attention to the interesting and well-established fact of the ancient Mexicans having long cultivated several varieties of those two wild endemic plants (*Agave* and *Opuntia*), together with others, as banana and vanilla, as an additional reason for believing in the great antiquity of that nation; and so, *pari passu*, for reasonably concluding the same of the Maori people, from their having cultivated for ages many varieties of their flax (*Phormium*) and “sweet potatoes”—kumara (*Ipomaea chrysorhiza*).
4. To acquaint our sheep- and cattle-breeders (several being members of our society) how badly off for grass

those of their calling are in those Southern States of America, and what very strange plants are consequently largely and successfully used by them for forage.

5. To place on record my (old) belief that not a few of those plants which we have long considered as mere weeds, and worthless, may yet become of great value for beneficial uses.

1893 On Four Notable Foreign Plants.

Transactions of the New Zealand Institute 26: 333-346.

[*Read before the Hawke's Bay Philosophical Institute, 9th October, 1893.*]

AT our July meeting I had the honour of reading to you my paper on two peculiar yet useful foreign plants that are acclimatised with us here in New Zealand—viz., *Agave americana* and *Opuntia ficus-indica*. A chief reason for my bringing them to your notice (as I mentioned at the time) was their having been well known to and cultivated by the Aztecs, or ancient Mexican nation, long before their ruthless invasion by the Spaniards in 1519; and, in continuing my researches in that same direction, I found other noted plants that were also assiduously cultivated by that ill-used race, which have since become of the highest esteem among

ourselves, and are commonly used by us and by nearly all civilised peoples.

And here I may (*in limine*) call your attention to two matters respecting those useful plants that have been so very long in cultivation, or rather, perhaps, I should say, to the ancient races by whom they were cultivated.

1. That such kind or class of labour—that of the husbandman—is always a sure proof of the antiquity of the civilisation of the people successfully practising it; for, leaving out the so-called barbaric or Stone Age of man, nothing can be more certain than this: that the proper cultivation of food-crops, wherever found, with all their attendant and necessary labour, must have been handed down from olden times; *pari passu*, I may truly say, with that of building good houses, and vessels for navigation, and all the many useful arts, &c., of life. For such works are not attended to by savage peoples, who live on the wild uncultivated vegetables and fruits of the earth, the spontaneous production of nature, equally with the flesh of the wild animals common to their countries. Indeed, here in New Zealand we have notable instances of this in two races that *lived* near us—the Tasmanians and the Australians. (I am, I regret to say, obliged to speak of one of these distinct peoples, the Tasmanians, in the *past tense*, as not one of them now lives, though once numerous; and all destroyed by civilised “Christian” man! and that, too, during my own time.) Especially when we also consider with them the very superior position of the Maoris of this country, whose extensive

[334] root-crops⁷⁹² were only annually raised and preserved through an immense amount of close attention and labour, and all done without the use of iron or any other metal. It is only when man has outgrown, or abandoned, the roaming, ever-changing life of a hunter, and has defined and settled his habitation, that he can become a real and loving cultivator of the soil.

2. That the beginnings of all such cultivation of food-crops, especially when the plants themselves are not indigenous to the countries in which they were anciently cultivated, is lost, far back in the night of history; hence, too, all particular mention of their introduction is always surrounded by marvellous legendary and mythical lore—a further proof, I may, I think, rightly consider of their high antiquity. And this is eminently seen in the ancient traditions among the Aztecs and other original American races, of how they first received some of their prized cultivated plants; in those also of the ancient Greeks respecting their first receiving wheat from Ceres, Isis, and Triptolemus; and those still more romantically mythical ones of the Maoris concerning their prized

792 WC: Cook says, "These plantations were of different extent, from 1 or 2 acres to 10; taken together, from 150 to 200 acres in cultivation in the whole bay"—Tolaga Bay—"though we never saw there an hundred people. Each lot was fenced in—so closely done that there was scarcely room for a mouse to creep between."—"Voyages," vol. ii., p. 313.

kumara; while those of the origins of their *taro* and *hue* and *aute* plants⁷⁹³ are utterly unknown.

As on the former occasion (above mentioned by me), so now, two of the plants I purpose bringing before you this evening were cultivated by those ancient Mexicans; these are the *banana*, so well known here among us as an esteemed and wholesome article of food, and the *vanilla*, almost equally well known for its sweet scent and flavouring uses, though neither of them are grown in this colony. And I think I shall be able to give you some very interesting, if not astonishing, particulars respecting both plants.

1. Of the BANANA, or PLANTAIN (*Musa sapientium* et *M. para-disiaca*, Linn.; *Musa sapientium*, Br.).

This plant is peculiar in many respects:—

1. From having been found in both the Old and New World.
2. From its antiquity, being mentioned in our oldest books; as by Pliny, who relates it having been found by Alexander in his Indian expedition in the greatest abundance in the country of the Sydraci, and that it was remarkable for the size and sweetness of its fruit, upon which the sages⁷⁹⁴ of India live. [335] Hence the botanical name of *Musa sapientium*. *Musa* (generic) is

793 WC: Kumara = *Ipomaea chrysorrhiza*, Forst.; taro = *Colocasia antiquorum*, Schott.; hue = *Cucurbita* sp.; aute = *Broussonetia papyrifera*, Vent.

794 WC: Gymnosophsists or Brahmins.—Hist., lib. xii., cap. 12 (6).

from the Arabic *mouz* or *mauwz*, which we find was given to it as early as the thirteenth century; the second specific name of *paradisiaca* comes from the ridiculous hypothesis which made the banana figure in the story of Adam and Eve. It is, however, a curious fact that the Hebrews and the ancient Egyptians did not know this Indian plant.

3. From its many varieties or sorts—upwards of sixty—all forming but a single species. The celebrated botanist De Candolle says: “There is an immense number of varieties of the banana in the south of Asia, both on the islands and on the continent. The cultivation of these varieties dates in India, in China, and in the Archipelago from an epoch impossible to realise. It even spread formerly into the islands of the Pacific, and to the west coast of Africa. Lastly, the varieties bore distinct names in the most separate Asiatic languages, such as Chinese, Sanskrit, and Malay. All this indicates great antiquity of culture, consequently a primitive existence in Asia, and a diffusion contemporary with, or even anterior to, that of the human races.” Cook found it largely cultivated at Tahiti. The accurate and observing Parkinson (Sir Joseph Banks’s botanical draughtsman), who was with Cook on his first voyage, says of it: “The well-known tropical fruit called plantains and bananas, of which there is a great variety in these islands; they reckon more than twenty sorts, which differ in shape and taste. Some of these are for eating raw, and others best boiled, and will serve instead of bread. They plant them in a rich soil, and take great pains in their cultivation. They call them *meiya*” (now *meia*). The celebrated Peruvian author Garcilasso

de la Vega⁷⁹⁵ says distinctly, "At the time of the Incas, maize, quinoa,⁷⁹⁶ the potato, and bananas formed the staple food of the natives." He describes the *Musa* of the valleys in the Andes, distinguishing the rarer species with a small fruit and a sweet aromatic flavour (the *dominico*) from the common banana, or *arton*. The botanist Desvaux, in a remarkable work published in 1814, studied the specific question. He gives it as his opinion that all the bananas cultivated for their fruit are of the same species. In this species he distinguishes forty-four varieties, which he arranges in two groups—the large-fruited bananas (7 in. to 15 in. long) and the small-fruited bananas (1 in. to 6 in.), commonly called fig-bananas.⁷⁹⁷

[336] R. Brown, in 1818, maintains the same as all belonging to one species, and so brought back Desvaux's second species (*M. paradisiaca*) to the one earlier-named one (*M. sapientium*).

We, however, here in New Zealand only know the banana, as an imported dessert fruit, and, as such, scarcely ever in perfection as fully ripe, seeing what we receive from the tropical isles of the Pacific are always obliged to be sent to us in a green or unripe state; and, then, of its many varieties we obtain (I believe) but *one*. It is far more extensively used as a vegetable (as well as a

795 WC: Descendant of the Incas, who lived from 1530 to 1568. A copy of his scarce work is in our Institute library.

796 WC: Quinoa, a small, insignificant plant, a species of *Chenopodium* (*C. quinoa*, Willd.). The leaves are dressed as spinach, and the small seeds are still esteemed at Lima.

797 WC: To a wild fertile species found in Asia, Desvaux gave the name of *paradisiaca*.

fruit) in the countries where it is grown as an introduced plant, particularly in the West Indies, for instance, where, while unripe, it is said to be excellent boiled as a vegetable, or sliced and fried as fritters for breakfast. Roasted and flavoured with the juice of oranges, or lemons and sugar, and made into a kind of *compôte*, it is very choice; in some countries the fruit is dried, in which state it can be preserved for months, or, if spices and sugar are added, it is formed into a paste quite capable of keeping good for years. The mealier ones, by being oven- or sun-dried, and then pounded, can be readily converted into a nutritious flour, which contains not only starch, but protein, or flesh-forming material. Finally, the "merissa" beer, which is drunk in prodigious quantities all over the Upper Nile and Lake Country in Africa, is the fermented juice of the banana. Even the Mahdi has had to wink at its consumption; while a recent traveller doubts whether he ever saw so many tipsy people as in a certain district of Africa. The banana will even yield medicine, for the juice of the stem—the spongy pith of which is also highly nutritious—is a useful astringent and diaphoretic. Taken internally, the leaves are said to be valuable against dropsy, and are often used externally in scalds and ulcers. The stems are in Tonquin burned, and the ashes employed for purifying sugar; while all parts of the plant abound in a fibre which has never been systematically used except in small quantities. In Dacca the country people make from it the string of the bow with which they tease cotton; and in some of the Indian islands a cloth is woven from the banana-thread which is not much inferior to that made from the *abaca*, a kind of banana that yields the well-known Manila hemp; and the

large fronds are employed not only for packing, and as plates for holding food, but in roofing native huts.

The banana, we learn from a United States official report, is so popular a fruit in that country that during August and September 78,000 tons were imported, while, on the other hand, its culture is extending with such rapidity that before long the entire home demand will be met by Florida, Mississippi, and other suitable areas of the Republic. It is, however, doubtful whether the warmest portions of the United [337] States will ever be able to compete with the West Indies in rearing a fruit which flourishes in such perfection all over Jamaica and the Antilles generally. Central Africa, too, is becoming one vast banana plantation. For miles and miles nothing else is seen; even the Indians of Central and South America have not taken more kindly to it. Captain Lugard describes the fruit as the national meat and drink.

In all these lands the plants grow with great ease, in spite of the fact that in many of them they receive the least amount of care. To set out a new plantation is the simplest of operations. The stems, formed by the base of the leaves, are annual, and usually die down after the exhaustive process of fruiting has been completed, new ones being produced from buds or suckers in the root-stock, which is perennial. It is by planting these buds that the banana is propagated, and fresh plantations made; and so exceedingly simple is this form of agriculture that the plant generally bears ripe fruit within ten months of the offsets being put into the ground. Emin Pasha tells us that, though the plantations in Africa are well kept, the

only manure they receive is bunches of grass allowed to rot around the base of each plant.

In conclusion, I may briefly observe that I have often been struck with admiration when considering the banana-plant, and noticing (here in New Zealand) the great size and heavy weight of its bunch of fruit, not unfrequently from 40 lb. to 50 lb. (while in the West Indies such attains to even 70 lb., and I have been credibly informed that in South America some sorts bear a bunch of fruit weighing over 100 lb.)—this, too, growing high up on the single columnar reed-like stem of the plant, and projecting far from it in a drooping form when the fruit is formed. There is such a wonderful provision of nature to sustain such a heavy mass when extended hanging by its simple annual stem, coupled with the bounteous gift of such a wholesome, ever-plentiful, and easily-grown fruit to the natives of the tropics. I have sometimes compared (mentally) the banana, as to its fruit being that of an *annual* plant, and produced in large quantities, with that of the pumpkin, another annual, whose fruits are often of a large size and weight; but the fruits of the weak pumpkin-vines are supported on the ground, and the plant itself is only raised with much care and attention from seed annually sown.

While staying a few days last month in the bush (at Dannevirke), I saw an express-waggon bringing away from the railway-station a compact load of green bananas in large bunches, each bunch set upon its end in the conveyance, filling it, and coming along slowly. On inquiry, I found there were twenty bunches of bananas. It

was a remarkable sight, there in that place so far inland.
[338]

ADDENDUM.—In order to make my memoir the more complete I have endeavoured to get, from official sources, the amount in weight of bananas imported annually into this colony, but have failed, owing to no distinction having been made in the sorts of fruits imported, all being classed together, but only in the countries producing them. I may, however, give the following official amounts of fruits imported from two principal places within the tropics in the South Sea, which includes (at least) four kinds of fruits commonly used—viz., bananas, pine-apples, cocoanuts, and oranges—omitting the Australian Colonies:—

	Lb.	£
1891 From Fiji	3,901,264	15,584
From South Sea Islands	4,554,629	17,136
1892 From Fiji	4,797,936	17,336
From South Sea Islands	2,688,831	9,434

2. Of *VANILLA PLANIFOLIA*, ANDREWS.

This plant—a species of orchid, anciently cultivated by the Aztecs (and, curiously enough, for one of the very same purposes for which it is now so extensively used all over the world—viz., to flavour their drinks, one of

which was cocoa), is also an indigenous plant of Mexico, and is still cultivated by them. Vanilla was formerly confined to a very limited area, and being an orchid, and a dainty tropical product, was scarce, and long considered difficult of cultivation, but of late years, and through the practical application of scientific knowledge, its production has wonderfully increased, so that it has become a large and pretty general article of commerce.

Few, perhaps, of my audience this evening know much respecting this plant save in connection with ice-creams and superior chocolate. The scented vanilla of commerce is merely the seed-pod of the plant, and, seeing it is now so well known by name, and so commonly used, a few interesting items respecting it and its early history and introduction into Europe, and the triumph of science combined with skilled persevering labour in bringing it on to a proper consummation, may not be considered out of place.

There is an excellent paper on the early history of vanilla in Europe by Professor Morren, of the University of Liége, from which I take several quotations. Professor Morren was one of the first (if not the very first) who succeeded in obtaining ripe fruits from the vanilla in Europe. He says,—

“Having been fortunate enough to obtain two years since, and at two different times, an abundant crop of this interesting fruit, I believe I may assert that henceforth we may produce in Europe vanilla of as good a quality, if not better, as that which is exported from Mexico.... My [339] experiments may afford the most convincing proof that in our own climate, but in our hothouses, the same

circumstances of atmosphere as those which exist under a Mexican sky produce in the vanilla plant all the phenomena of a good and perfect maturation of the fruit.... The *Vanilla aromatica* of Swartz, introduced into Europe in 1739 by Miller, is not to be found at the present time in England. This species was long believed to be the true vanilla of commerce. But the *Vanilla planifolia* of Andrews⁷⁹⁸ is the same plant which is generally cultivated on the Continent, and has produced at Liége an abundant crop of odorous and delicious fruit. This interesting species was at first cultivated in the Hon. Charles Greville's choice collection of plants at Paddington, near London, where it flowered for the first time; but then, no artificial fecundation having been performed, no fruit was produced. In 1812 this plant was carried from the gardens of Mr. Greville into those of Belgium, whence it was introduced at Antwerp. The plant grew rapidly there in the Botanic Garden, and slips were sent to all the towns in Belgium and France, but they very rarely flowered, and fruit was never obtained, so that this culture was despaired of. Nevertheless, in 1819 Dr. Somm  (the director of the Botanic Garden at Antwerp) sent two plants of vanilla to the curator at Brussels that he might send them to the Dutch colonies of Java, where it was said the plant might become valuable by its produce. The history of this migration of the vanilla-plant from America to the East Indies is too interesting not to be made known. Only one of the two roots stood the long passage from Belgium to the East Indies. There at Java, in the Botanic Garden, it prospered

798 WC: Repository, vol. viii., pl. 538.

well, and flowered, but its flowers bore no fruit. The observations on the necessity of an artificial fecundation in the greater part of the orchideous plants were not known at that time; and I attribute the flowers of the vanilla not bearing fruit in the East Indies to the absence of the species of insect which nature has doubtless given to the climate of Mexico to effect there a fecundation which man alone, by a study of the organs, is able to perfect in other countries. It was long after—in 1836—that, by a peculiar horticultural treatment, we had at Liège, upon one vanilla plant, fifty-four flowers, which, having been fecundated by me, produced the same number of pods; and in 1837 a fresh crop of about a hundred pods was obtained upon another plant by the same methods; so that now there is not the least doubt of the complete success of this new cultivation.

“From the works of the illustrious Alexander von Humboldt we learn that the Mexicans were already in the habit of [340] perfuming their chocolate when the Spaniards discovered this part of America. Chocolate was brought from Mexico into Europe in 1520, but it appears that vanilla was brought to the Continent as a perfume about the year 1510, at the same time as indigo, cochineal, and cacao itself—that is to say, ten years before the arrival of tobacco.... I find that the *Vanilla planifolia* is as common in the gardens of the British Islands as in those of the Continent; but the complaint there generally is that it very rarely flowers.... The vanilla-plant in order to flower should be at least five or six years old. The older and larger it is, and the more branches it has, the better and more abundantly it will flower.... The culture consists in twining the long

branches, cutting, and burning them at their extremity with a hot iron; everything that contributes to stop the sap serves to bring it into a flowering state.... The flower of vanilla has this peculiarity: that the *retinaculum* is highly developed, so that this organ forms a curtain suspended before and above the stigmatic surface, thus separating it completely from the anther, which in its turn incloses in two cavities, naturally shut, the pulverulent masses of pollen. From this structure it results that all approximation of the sexes in this orchideous plant is naturally impossible. It is thus necessary either to raise the *velamen* or to cut it when the plant is to be fecundated, and to place in direct contact the pollen and the stigmatic surface.... The direct results of this memoir, therefore, go to prove that in all the intertropical colonies vanilla might be cultivated, and a great abundance of fruit obtained, by the process of artificial fecundation.... It is a subject which well deserves attention in a commercial point of view, and is, moreover, a proof of the importance of science in improving every branch of industry."

I have gone to some length in these extracts, because (as I shall be able to show you) much of what Professor Morren has so clearly stated, and almost foretold, has already come to pass.

Not very long ago some 5 cwt. or 6 cwt. was the total of vanilla imported into England from Mexico. At present the United States alone take about 136,000 lb. from Mexico, and a proportionate amount from other sources. The Mexican form, we are told, still holds its own in the market, but several other varieties are now cultivated.

Numerous other regions have of late years competed with Mexico for the custom of the vanilla buyer. The latest of these is our colony of Fiji, from which some choice samples have been sent to England. Java now harvests enough for the Dutch consumption, none of it being offered to the outside world; and Bourbon, from which in 1849 only 7 lb. or 8 lb. were exported, has now 3,000 acres [341] under cultivation, and a crop which seldom falls below 200,000 lb., while the quality has been so greatly improved by careful cultivation and preparation that Mexico is beginning to feel uneasy. What is known in commerce as "inferior Bourbon" is actually the product of our colonies of Mauritius and the Seychelles. Brazil, Peru, and other parts of South America are also in the market with their vanillas, while the Pacific coast is well supplied from Tahiti and the Sandwich Islands; and, as the market does not appear to be glutted—the perfumer and the confectioner finding a use for all that is raised—it is likely that West Africa and all the West Indies will before long enter the field; for, notwithstanding that the *planifolia* of Mexico is still the best of the vanilla species, it is quite capable of being transplanted, and it is notorious that several of the other varieties are wonderfully improved by being grown a little less at haphazard than in their native woods. But every sky will not suit the vanilla orchid. The soil is of slight moment, since the plant, clinging for support to trees or to trellis-work, derives a large portion of its nourishment from aërial roots, as is the case with some of our indigenous epiphytal orchids, only these do not arise from the ground. The climate seems to be all-important, for the plant requires a mean temperature of between 75°

and 80°, and a damp, steaming atmosphere. Its long, fleshy pods take some six months, or more, to arrive at perfection, and constitute the portion of the plant in which lie its peculiar virtues. A clearing is made in some damp part of the forest, a few trees being left to serve as supports for the vanilla-plants, which are then planted out in the shape of cuttings, and left to the kindly action of the equatorial sun. In three years they are ready for harvesting, and for thirty more will yield pods enough to pay for the gathering. Nor is much care required, except to aid the fertilisation of the flowers by artificial means. But in Mexico this is not needed, and the process of fertilisation (which in no orchid, as Darwin has taught us, can be effected by itself) is accomplished by means of native insects. Yet it is known from experience that even artificial fertilisation has to be performed with judicious care; for, were all the flowers to be fertilised, the result would be an overflowing crop one season, but almost certain death to the plants through exhaustion before another season arrived. Then comes the plucking, each pod being detached as it ripens, a crackling sound as it is passed between the fingers being the criterion as to its ripeness. After being dried in the sun the pods are slightly fermented, to develope their peculiar odour, and, in some places,—for the *modus operandi* differs in different countries,—rubbed over with oil before they are sent to market. Long experience is required, not so much for the cultivation of [342] the vanilla as for preparing and assorting it for sale. The presence of the *givre*, or “frost,” is regarded as the test of the best pods. The “frost” consists of needle-shaped crystals, which begin to form at the ends, and gradually spread in a white powder over the

whole pod. This efflorescence is composed of the substance known as "vanillin," and to it the peculiar fragrance of the pods is due. Vanillin is, however, not confined to the orchid from which it derives its name. Considerable quantities of it have been extracted from Siam benzoin and raw sugar, from the sapwood of fir trees, from the oil of cloves, and, of all sources, from assafoetida! Ices flavoured with vanilla have not infrequently been found to be poisonous. It is, nevertheless, affirmed that the vanilla has no evil effect on the human system, as much as 15 gr. having been swallowed without the patient suffering. On the contrary, it is an aromatic stimulant, exhilarating the mental powers and increasing greatly the energy of the animal system. It is depressing to think that, just when this fragrant orchid looks like becoming one of the good angels of the tropics, the German chemists are manufacturing vanilla artificially, though, happily, they are not likely ever to produce the exquisite balsam of the ripe pods, which is so seldom to be met with in Europe.

In fine, seeing that the vanilla was, at last, successfully cultivated in the hothouses in Liége and in other places in Europe, and is also become a new and an increasing article of commerce from our Polynesian neighbours—Fiji, Tahiti, and the Sandwich Islands—such may also, in years to come, be raised here in our Colony of New Zealand, at the more northern parts, and under glass.

Tempus revelat.

3. Of the EDELWEISS = *Leontopodium alpinum*, Cass., and its two New Zealand relations.

For my third plant I must take you to the Alps, to the mountains of Europe, particularly to those of Switzerland and Austria; and also to those nearer us—the Alps of the South Island, and our own Ruahine. From the small, very local, and peculiar herbaceous plants of the Swiss mountains I select the famed edelweiss (*Leontopodium alpinum*, Cass.), and this for at least three reasons:—

1. Because it is also considered to be a great and valuable rarity, and has become of late years an increasing article of commerce, so that laws have been obliged to be made by the Swiss and by the Austrian Governments, to prevent their little plant of world-wide celebrity becoming extinct.
2. Because the Swiss mountain flora is very peculiar, possessing more than 120 alpine plants not found anywhere else; these are believed to be involuntary migrants from the arctic [343] regions, survivors of the flora driven south before the advancing ice-sheet of the glacial period.
3. Because we have here in New Zealand on our mountains two closely-allied plants resembling the Swiss one, which are usually known as the New Zealand edelweiss—viz., *Gnaphalium (Helichrysum) colensoi*, and *Gnaphalium (Helichrysum) grandiceps*, both plants first described by Sir J.D. Hooker in his “Handbook of the Flora of New Zealand,” the former of these two from Mount Hikurangi, near the East Cape, and also from the Ruahine Mountain-range, where I first met with it in 1845; and the latter from the Southern Alps, where it was

first detected in several localities by Dr. Sinclair, by Professor Von Haast, and by Dr. Hector. There is not much difference between them apparent, however, on close comparison and examination, and they strongly resemble their European relative.

Several years ago the Swiss cantons were obliged to pass a law prohibiting the common reckless collecting, and consequent rapid destruction, of their alpine plant *Leontopodium alpinum*, for the havoc among the patches of edelweiss had become so great that, in order to protect it from the ravages of climbing tourists, the Government of Valais was compelled, in 1887, to make enclosures for the undisturbed cultivation of the plant, and at the same time to issue an order that the edelweiss was no longer to be plucked. This was soon followed by Austria; and I find more recently that the Diet of Tyrol have been obliged to do the same. Here is a notice of it from a late London paper: "The Diet of the Tyrol last week passed a Bill imposing heavy fines upon persons found selling any samples of the beautiful but rare alpine flower called edelweiss, which has been pulled up by the roots on the mountains. A similar Act was passed seven years ago by the Diet of Salzburg, with a view to the preservation of the edelweiss plant, which is threatened with extinction in the Austrian Alps. In the Salzburg district the success of this legislation is not encouraging."⁷⁹⁹

Its destruction was one of the many unpleasant results of the alpine mania. The little plant, with its protective covering of woolly hair, is no doubt a curious and pretty

799 WC: London Standard, 21st April, 1893.

one; but there are many more attractive flowers on the mountains. The edelweiss is, however, rather difficult to obtain, and, not being found much below an altitude of 5,000 ft. or 6,000 ft., the wearing of a sprig in the tourist's hat, after the guides' style, is supposed to infer a moderate acquaintance with the mountains a little way from the hotel-doors, if not some experience in that "climbing" which, for two or three months in the [344] year, forms the staple of conversation at the local *tables d'hôte*.

I remember reading some time back of a London *belle* (of whom it may be said she possessed "more money than wit") spending no less a sum than £300 in the making of a dress-cloak or mantle for her use at a grand ball completely overlaid with edelweiss.

I can show you specimens of the southern plant,—*Gnaphalium (Helichrysum) grandiceps*—and of the Swiss plant—*Leontopodium alpinum*—the true edelweiss; but for our northern (or Ruahine) plant I must refer you to the coloured drawing of it in Hooker's "Flora Novæ-Zelandiæ," made from my Ruahine specimen. I never met with this plant but once in all my visits to that mountain region, and that was on the edge of their western summits, at above 5,000 ft. elevation. It was profusely growing on the outer edge of a steep cliffy fall of broken shingle, through which it was a difficult matter to force one's way up to it, as the small dry *débris* from the high cliff formed such a loose slope (*or talus*) on which there was no standing, and carried everything down before it. I often sought this plant on subsequent visits, but without success. Dr. Sinclair, however,

detected it growing in a similar situation in the South Island, at "Tarndale Mountains, 5,000 ft. altitude, in shingle"; and it is worthy of remark that in both Islands it keeps at about the same elevation as the allied Swiss plant.

Between the two genera of *Gnaphalium* (*Helichrysum*) and *Leontopodium* there is but very little difference. The small genus of *Leontopodium*, containing only three species, established by Brown, has been merged into *Gnaphalium* by both Hooker and Bentham.

4. Of the ROSE OF JERICHO = *Anastatica hierochuntica*, Linn.

Another highly curious, little-known, and local plant, commonly known as "the rose of Jericho," and also "holy rose," I now bring to your notice. I have lately obtained the loan of a perfect plant of this singular vegetable for exhibition here, thinking it would prove as great a curiosity to you as it was to me, for, although I knew it from drawings and from description, I had never before seen a specimen. Strange to say, this plant is not only no rose, nor even distantly allied to that delightful flowering family, but is a species of the more common Cruciferous or *Brassica* order, to which our cabbage, turnip, radish, and watercress belong. It is, moreover, an annual very local in its *habitat*, growing wild in the sandy arid deserts of Egypt and of Syria, and on the coasts of the Red Sea, and is the only species of its genus; [345] and further it has only one other allied genus, *Morettia* (and this too, like that, containing only a single species), in the fifth tribe of the extensive order of Crucifers, or *Brassicaceæ*.

As this plant is a very great singularity, and famed for its strongly-marked hygrometrical properties, and as I have a specimen to show you, I may also tell you a little about it—both natural, and legendary and mythical.

1. *Natural*.—It is a small, annual, dwarf, shabby-looking plant, only a few inches high; it has one stout tap-root, and its stem, also stout, is short and very much dichotomously branched from the neck, and expanding while young; leaves small, oblong; flowers minute, white; pods also small, ventricose; seeds few. After flowering the leaves fall off, and the branches and branchlets become dry, hard, and woody, and are soon contracted into a globular form. In this state the little plant is easily withdrawn from the sand by the wind, hurried from place to place, and blown from the desert into the sea, or into any water, and as soon as it is wetted the branches relax and expand as if its life was renewed; the valves of the pod open, and the tiny seeds cast on the shores are scattered with the sand by the winds until they are settled, when they spring into life and take root. If this plant is taken up before it is withered, and kept entire in a dry room, it may be long preserved, and after being many years in this situation, if the root is placed in a glass of water a few hours, the buds of flowers will swell, open, and appear as if newly taken out of the ground, or it will recover its original form in the same manner if wholly immersed in water.

I may here mention that I have been sometimes reminded of this little natural globose vegetable ball, drifted about by the winds over the sandy deserts of Arabia, on seeing the globular heads of the female flowers of the large

indigenous sea-side grass, *Spinifex hirsutus*, similarly blown about by the winds over the flat sandy shores of our own coasts in my old travelling-days. Indeed, there have been times—at low water, and the sandy flats dry, and wind fair (behind us)—when my Maori companions, carrying heavy loads, in order to relieve the tedium of their long journeys, would gather a few of those round, dry heads, and set them a-going before them, they keeping up a kind of short run after them. From this ancient Maori circumstance and juvenile custom, and the natural rolling of the ball before the winds when ripe and dry, they call those heads *turikakoa* = joyous, or nimble, knees.

The monks of Palestine gave it the name of “the rose of Jericho,”⁸⁰⁰ and also “holy rose,” and of it they make a little [346] money. They dry it, and sell to travellers and pilgrims as possessing miraculous powers.

2. *Legendary and Mythical*.—Some superstitious tales are told of it, among which it is said “to have first bloomed on Christmas Eve, to salute the birth of the Redeemer, and also paid homage to His resurrection by remaining expanded till Easter.”⁸⁰¹ The common people in Palestine believe that if you put this plant in water at the time when a woman first experiences the pains of childbirth it will expand at the precise moment when the infant is brought into the world. The plant is called *Kaf Maryam*, or *Mary’s Flower*, in Palestine, because it is

800 WC: From, I suppose, “Ecclesiasticus,” xxiv., 14—”A rose plant in Jericho.”

801 WC: “Gardeners’ Chronicle,” 1842, p. 363.

supposed that the flower opened at the instant Jesus was born.

We have in England many plants bearing similar names, connected with ancient legendary lore, or such may have been originally intended as reminiscences or *souvenirs* of holy things—as, lady's mantle, lady's tresses, lady's slipper, lady's bedstraw, lady's looking-glass, lady's comb, &c. Such colloquial names of plants abound in all European countries; and here, too, in New Zealand, the ancient Maoris called several plants, their flowers and fruits, after their old mythical personages, by way of commemoration.

Here, too, in conclusion, a remark by way of explanation may be made respecting the somewhat strange and long scientific name given by Linnæus to this little plant, which may also be termed a hard one, but yet (like many of the plants of the olden times, named by him and other thoughtful botanists) full of meaning. (1.) Its generic name, *Anastatica*, is from the Greek ἀνάστασις = rising again, resurrection, or, rather, revivification, and is highly suitable. (2.) Its specific name, being a compound of two Greek words, is more difficult, yet also proper, meaning (as I take it) audaciously, impudently, or shamefully, holy! carrying with it a kind of double rebuke—(a) at the poor little insignificant desert annual of no floral beauty being called a *rose*; and (b) at the further daring assumption of *holy* to that pleasing name of the queen of flowers.⁸⁰²

802 WC: In our English botanical works I find this specific name differently spelled as to its termination: *hierochuntina*, Lindley and

**1893 “More Last Words”: being an Appendix to
several Papers read here during Past
Sessions on the Volcanic Mountain-range of
Tongariro and Ruapehu, with its adjoining
District. *Transactions of the New Zealand Institute*
26: 483-498.**

[*Read before the Hawke's Bay Philosophical Institute,
10th July, 1893.*]

—profert de thesauro suo nova et vetera.⁸⁰³
MAGISTER.

A MONTH back I felt not a little surprised and grieved (in common with many others) at a statement that appeared in our local morning paper respecting Mr. William Collie, an unassuming, truthful, toiling, steady photographic artist, who formerly (twenty years ago) carried on his profession here in Napier. It was stated that “a camera, &c., had been lately found on the high slopes of the burning mountain Ngauruhoe, which from appearances looked as if the artist had been scared at the rumbling of the volcano, dropped his instrument, and fled.”

Apart from the irrationality of the notice as to the “appearances,” &c., of the long-lost “camera,” now

others; *hierochunta*; and by Mueller, in his recent “Index Perfectus,” Linn., *hierochuntica*. This last I have here adopted.

803 He bringeth from his treasure new things and old. Vulgate Bible, Matthew 13: 52.

found after fifteen years' exposure to the elements on the barren [484] stony mountain—alike to summers' suns and winters' frosts in that elevated region—was the undeserved innuendo—ugly joke, or worse—on Mr. Collie.

At the time of my reading that statement I was absent from town on duty in the interior; but, as I had known Mr. Collie pretty well, had often admired his large photographic landscape-views of distant and strange places—only obtained through much toil and difficulty, hardship and danger—and frequently had conversations with him in his studio, even concerning that, his last and unfortunate visit to Tongariro, in which he met with his great loss (for he had sought counsel from me on his return to Napier respecting the Maori raid made upon him, and his consequent injury and damage), I was determined to have justice—fair-play—done him. At such times, a quaint distich from Goethe's "Faust," where, in the inimitable scene on the Brocken (blasted mountaintop), in the Walpurgis-night, Mephistopheles accosts one of the old witches riding on a sow, saying,—

Honour to whom honour is due;
Here, mother Baubo, is honour to you,—

would continually revolve in my mind, causing me even to repeat it over and over, although forty years had elapsed since I last read it in Goethe's work—(possibly this happened through the association of corresponding ideas—connecting what I had been just reading and what I had heard from Mr. Collie with my own trying experiences in that locality forty-five years back)—and I concluded that Mr. Collie should have due honour done

him for his courageous and loving artist-visits to Tongariro. For, in those days, and situated as he was—a stranger with limited means and few friends in this (then) small town—it was a very different thing to carry out such a visit over an unknown and trackless country (much less a repeated one, and after receiving maltreatment from resident Maoris, and enduring severe losses) from what it is now in these modern days—with roads, coaches, inns, store-shops, settlers' houses, and horses; the Maoris themselves there residing no longer enemies, but much more civilised and quiet, and enjoying “piping times of peace.”

And here I should briefly state that I would have written a letter to the editor of that morning paper already mentioned on my return to Napier, but an acquaintance of Mr. Collie, residing at Waipawa, took the matter briefly up in a communication of his to that same paper, which I was glad to see; and soon after a full, plain, and interesting account of what had really taken place at that time of Maori disturbance at Tongariro, written by Mr. Collie's travelling companion on that occasion (Mr. F. E. Lys), appeared in the columns of the [485] same paper,⁸⁰⁴ which, as far as that subject was concerned, seemed to be quite sufficient.

Subsequently, however, on my remembering a few nice botanical specimens collected at Tongariro by Mr. Collie, and given by him to me (some of them—*Dracophyllum*

804 WC: A copy of Mr. Lys's letter I shall give at the end of this paper, for I consider it well worth being recorded, if only to preserve another instance of the Maori treatment the early settlers and artists (true lovers of nature) had to put up with.

rubrum, *Pimelea stylosa*, and *Thelymitra nervosa*—being novelties, were described by me⁸⁰⁵ and exhibited here before this society in 1887); and also in looking over my album and noticing therein some of the fine photographic views taken by him of Tongariro and Ruapehu; and, further, on my referring to Mr. Hill's paper, read here before you, containing a full account of his visit to those mountains in 1889⁸⁰⁶ (including copious interesting extracts from the accounts of the early visits made to those mountains by Messrs. Bidwill and Dyson some fifty years before), and finding that Mr. Hill, not knowing of Mr. Collie's visits thither, had made no mention of them, although he had slightly noticed other visits made afterwards, as if these were really the first in succession after those of Messrs. Bidwill and Dyson,—I determined on writing a short paper—a résumé of Mr. Collie's repeated visits to that locality: especially, too, as he had done what no one else has done, either before or since—descended into the crater of Tongariro and spent a night within it.

But before that I take up with Mr. Collie's visits, I think I should also mention a still earlier one, performed by Dr. (now Sir James) Hector, to Tongariro in the year

805 WC: In Trans. N.Z. Inst., vol. xx., p. 200, et seq. And here I may mention that among that small lot of dried plants was a specimen of the common red poppy of our British cornfields (*Papaver rhæas*), which astonished me; the only specimen I have ever seen in New Zealand. In that same paper several of Mr. Hill's plants from that locality were also described.

806 WC: In Trans. N.Z. Inst., vol. xxiv., p. 603.

1867, about ten years before the first visit of Mr. Collie, as this also seems to have been unknown to Mr. Hill.⁸⁰⁷

I quote from the published proceedings of the Wellington Philosophical Society: "Dr. Hector gave an account of his own ascent of Tongariro on the 23rd November, 1867, and explained that the active steam-eruptions on the side of the [486] mountain were due to the percolation from a cold lake on the summit, a sketch of which he exhibited. Dr. Hector then gave a list of plants differing from alpine-plants in the South Island, and exhibited on the screen with the lantern views both Ruapehu and Tongariro."—(Trans. N.Z. Inst., vol. xii., p. 423.)

Mr. Collie's first⁸⁰⁸ visit thither was in May, 1878, and his second in December of that same year (these two dates I obtain from his own paper "On Volcanoes and Geysers in New Zealand," read by Dr. Hector before the Wellington

807 WC: I may also briefly notice, in a note, that another ascent of Tongariro was made by Mr. Lys in 1881, when he conducted an American tourist, Mr. M—, to the top of the mountain. Being there overtaken by a snowstorm, they were obliged to pass the night on the summit, but not within the crater. The tourist, however, in an account which he published in a Sydney newspaper, on his arriving there, stated that his night on the volcano was passed within the crater.

808 WC: Yet on one of his large photographic views of Ngauruhoe is an inscription, by himself, that it was taken in "1874." This seems strange; and Mr. Lys (to whom I have submitted it) assures me it must have been an error for 1878, as Mr. Collie had not been there before this date. The large views of Rotorua and the hot springs there, immediately preceding in the same album, are all dated "1874," which, if written at the same time, might have easily led to the error in the last figure.

Philosophical Society in June, 1879);⁸⁰⁹ but he was still there in January, 1879, as I gather from a date written by himself on a photographic view of Ngauruhoe. On each of his visits he spent several days on the mountain and in its neighbourhood.

In that short paper of his is his description of the crater, of his descending into it, and of his passing a night within it—all interesting and very plain, short, and terse; perhaps the only fault to be found with it is its extreme brevity. That, however, will enable me the better to quote it verbatim here (seeing such a daring feat is all but unknown), while it serves to contribute an additional item (combined with the still earlier ascent made by Dr. Hector) towards the completion of the longer and more particularly scientific account of the mountain by Mr. Hill.

"Tongariro (Ngauruhoe).—When the writer visited the crater of Tongariro in May of last year (1878) there was a cone on the north-west side of it. This cone was about 120 ft. wide at the top, and was closed at the bottom, as if the volcano had not been in action for a considerable time. Upon the writer's climbing the mountain (a feat always attended with difficulty and risk) and descending into the crater in December following, he found that the above cone had completely vanished, and that along the greater part of the north side of the crater another cone, about 500 ft. wide at the top, had been violently thrown up. In the interior of this cone, at the bottom, there were two openings opposite each other, out of which

809 WC: *Trans* xii: 418–420.

sulphurous steam was blown in considerable quantities. The outside of the cone was of loose material, as might be expected from its recent deposition, and was composed of stones, pumice, cinders, and *débris* of the mountain. [487]

"It is thus evident that this volcano is still active, although at uncertain periods. Over the floor of the crater, and up aloft along the sides, as well as outside the mountain, sulphur steam was issuing in all directions, tinging the orifice with yellow crystals of sulphur. The whole crater of Tongariro might be 1,500 ft. wide. The loose burnt sides overhanging the floor are gradually falling down, altering the configuration of the summit of the mountain. Upon the floor of the crater there were several thick patches of hardened snow, and at the north side under the cliffs a large wreath of snow, melting from the heat beneath, formed a singular-looking cavern with a scalloped roof as of white marble. The writer spent a night inside the crater, and found the air intensely cold till the sun rose high enough in the morning to shine into the crater. Astronomers in scanning the volcanoes of the moon have noticed about the middle of the floor of certain craters a small cone, giving rise to speculation about its cause. Does not Tongariro afford explanation—that, as the volcanic forces exhaust themselves, they give vent to their expiring forces by a small cone?"

And this daring action of Mr. Collie's is capped by another, as I view it—that is, his spending a month or so on the barren and volcanic ever-burning White Island, in the Bay of Plenty, in pursuit of his beloved science. Perhaps some of my hearers have not only heard of that

exploit, but may also have seen those photographic views which he took while there, some of them highly suitable for illustrating Doré's Dante's "Inferno," and that from truly natural scenes. I may mention, for the information of those who may not have heard of it, that when Mr. Collie visited that island in 1877, by a vessel trading between this port and Auckland, it was stipulated that he was to be called for on her return voyage to Napier; but this could not be done owing to the state of wind and weather—the island also being several miles out of the common course; and so, instead of being there for only a few days, he and his companion (the same young man who subsequently accompanied him to Tongariro, Mr. F.E. Lys) were prisoners for nearly a month. Fortunately they had taken the precaution to carry a month's provisions with them from Napier, and also water in kegs, as there was none on the islet save what might be found in shallow holes in the rocks after rain. When they were rescued their stock of water was nearly exhausted, and, although they had fishing-lines and hooks with them, yet, from the depth of water immediately around the island being very great ("out of soundings," according to the Admiralty survey), they certainly had no prospect of ever catching any fish.

There being no vegetation on the island, except a little [488] scrub at the high and inaccessible north end, and the whole soil being so largely impregnated with sulphur that on a lighted match being thrown on the ground it caught fire immediately, their time there must have been the very opposite of pleasant. Then, the exposure to the winds and sun was extreme; but the very worst was when the land-winds blew strongly towards them across the

flaming sulphur-beds beyond the hot-water lake, covering them with dense clouds of stinking smoke and thick clammy vapour, rendering even breathing difficult, from which there was no escape. The lake, according to survey, contains an area of nearly 16 acres, surrounded on more than three sides by high precipitous cliffs, the two highest peaks being each nearly 900 ft. high.⁸¹⁰

In that short paper of Mr. Collie's (only two pages) read before the Wellington Philosophical Society he says a little about the volcano in White Island worthy of being quoted here. He commenced it by saying, "In the pleasant, if sometimes arduous, pursuit of art-photography, the writer camped for weeks close to the main volcanoes and geysers of the colony, enjoying excellent opportunities for search into the origin and working of these marvellous and attractive exhibitions of nature's powers. And, viewing the existence, or it might be termed life, of the earth in its present state for at least thousands of years, the question naturally arose to the wayfarer of today amongst these interesting scenes, 'Whence the activity which still pours forth the boiling waters of Rotomahana, to run glistening down the silica terraces of their own constant formation?—wherein the force that lights the red fires which burn ever in the crater of White Island?—or what the motive-power that still throws up a cone in the crater of Tongariro

810 WC: See Trans. N.Z. Inst., vol. iii., p. 278, for an interesting scientific paper on the geology, &c., of White Island, with diagrams, by Dr. Hector, who visited it in 1870; and also same work, vol. i., p. 57, for another scientific paper on the island, with map and rough survey of the crater, by Lieutenant R.A. Edwin, R.N., who visited the island on two occasions a few years before.

(Ngauruhoe)?’ The reply from the waters of Rotomahana, from the fires of White Island, and from the cone of Tongariro, was the same—the one word, Sulphur.”” And he closes his paper with remarking,—

“*White Island*.—It is generally supposed that the vapours arising from White-Island are steam from geysers, whereas sulphurous steam never rises to any height. The main forces of the grand display at the ‘Theatre of Nature’ upon White Island are burning beds of sulphur, which show their red fires at night across the lake, whilst the fumes rise up into the air in volumes, to spread there at a great height, like a balloon, or [489] flow away in a train over the sea before the breeze.”—(*L.c.*, pp. 418–420.)

Mr. Collie also took several photographic views of those wonderful natural terraces at the boiling springs, Rotorua, in the year 1874, fortunately before the destruction of their marvellously beautiful symmetry by the great local earthquake or eruption in 1886, and his observations thereon are somewhat remarkable, especially his remark made while contemplating them: “On what a slender thread the beauties of that mountain-side hang!”—words since proved too true. And as his whole brief statement thereon is contained in a few lines, I quote them:—

“*Rotomahana*.—During the writer’s stay at the Terraces he was favoured with an exhibition of the subsidence of the waters of Te Tarata into the caverns below; and as the Terraces on that occasion got dry it was noteworthy how brittle the silicious surface became, showing upon what a slender thread the beauties of that mountain-side hang; for, were the flow of the blue waters to stop—as stop it

must when the energies of the forces below exhaust themselves—the glory as well as the cause of Rotomahana will disappear.”—(*L.c.*, p. 419.)

Furthermore, on again referring to Mr. Hill's paper I find that he mentions very briefly the strange and peculiar high volcanic plateau lying on the eastern side of those mountains. I quote his words:—

“The portion of the plateau running along the eastern side of Ruapehu and Ngauruhoe is known as the Onetapu (sacred sands) or Rangipo (cloudy sky)” (*sic*) “Desert, and it well deserves either name. Some parts of it are swamp, and exceedingly dangerous, whilst the portion not swamp is made up of moving sands, scoria, cinders, clinkers, and tufas; and, although its traditional history is not reassuring, it is a spot well worth the attention of geologists, for some very curious and rare specimens of volcanic rocks are to be found in places left bare by the ever-moving sands.”—(*Trans. N.Z. Inst.*, vol. xxiv., p. 606.)

Having myself had on two occasions, in 1847 and 1849 (in performance of duty), to cross that desert (then little known), and on the first time suffered much, and having also obtained from that neighbourhood several new and curious plants, I am desirous of telling you somewhat respecting that first journey of mine, which, I think, may prove both new and interesting; and which, if placed on record, will serve to show in days to come how the early traveller occasionally fared.

I shall quote from my journal, prefacing, however, by stating that I was then on my way from Ahuriri (now Napier) towards finding some little-known Maoris, who

were said to be [490] dwelling isolated on the upper banks of the Rangitikei River, near the western flank of the Ruahine Range. I had tried to get to them in 1845, through direct crossing over the range by its eastern side, and, though I had succeeded with some difficulty in gaining the western summits, I was obliged to give it up.

I left Ahuriri on the 9th February, and after a long and weary circuitous kind of march—rendered the more trying from there being no roads, and without a guide, and from our not being able to obtain a supply of Maori food (as potatoes) on the way, it being too early in the season—we arrived at the village of Rotoaira, near Tongariro, on the 18th February; were well received by the Natives, and there we stayed that night.

As this was the last southern village of the Taupo country I endeavoured to get a guide hence to the Patea district, and only after great difficulty succeeded, as the country over which our course lay was rugged and difficult, and there was no regular track hence to the Patea villages; only once a year—or in two or even three years—did a small party of Maoris visit Taupo from Patea; rarely if ever did any go from Taupo to Patea.

Nothing is more surprising to me among the many and great changes which have been effected in this country during the last fifty or fifty-five years than this of common fearless communication between the Maori villages and tribes, which formerly did not exist—not even between what are now considered (even by the natives themselves) as neighbouring villages. I could not, however, help fearing that, just as on former occasions so now, our “guide” would prove to be of little real service.

"19th.—We rose early and crossed the head of one of the main branches of the Waikato River (which is the outlet of Rotoaira Lake) at 5·30. Winding round the immediate base of Tongariro Mountain, over undulating ground, we halted at 7·30 to breakfast by the side of a mountain-stream of very cold and pure water, which ran bounding and sparkling in the sun among the rocks. Breakfast over we recommenced our journey, and travelled steadily on. During the former part of this day I met with several botanical novelties—*e.g.*, a very handsome full-flowered *Cyathodes* (*C. colensoi*, Hook.), a low bushy shrub of depressed growth, some plants bearing white and some red berries in profusion: this will become a garden flower. The abnormal prostrate species of pines (*Dacrydium laxifolium* and *Podocarpus nivalis*) were also here, in many places completely matting the surface; also, two or three species (or varieties) of *Gaultheria*—one, in particular, bearing plenty of good edible fruit. Another was very curious, and [491] interested me much; it was plentiful, and grew prostrate, having a racemose inflorescence and baccate calyx, which gave it a singular appearance, as if double-fruited: this is, I think, var. ϵ of Sir J. Hooker's *G. rupestris*. A distinct species of *Epacris* (*E. alpina*) was also here, but, unfortunately, it was not fully in flower. In damp spots (but only in two places) two curious species of *Drosera* were found—*D. binata* (remarkably fine), and the much rarer one, *D. arcturi*, a plant of the Australian and Tasmanian mountains—the only time I ever met with this latter species; together with a rather scarce orchideous plant, *Prasophyllum nudum*; and in the thickets adjoining, by the sides of the mountain-streams, *Phyllocladus alpinus* and several

species (or varieties) of *Aristotelia* with small leaves were noticed. A peculiar-looking small restiaceous plant, a species of *Calorophus*, was also obtained here in a boggy spot. I had found a similar plant several years before in bogs at Whangarei, and near Cape Maria Van Diemen, but in each locality only a little of it. Of the cyperaceous order, I collected two species of *Schænus* (*S. concinna* and *S. parviflorus*), *Carpha alpina*, *Isolepis aucklandica*, and also several species of *Carex*, among them being a British species, *C. stellulata*. In dry gravelly spots I also detected *Asperula perpusilla* (which I had last year discovered in similar situations at the base of Tararua Mountain-range, in Palliser Bay), and the moss-like tufted *Raoulia australis* was not infrequent. Many beautiful plants of the lichen order I also met with. Prominent among them were several species of *Cladonia*, particularly *CC. capitellata*, *aggregata*, *retipora*, and *cornucopioides*, this last strongly reminding me of the pretty (never-to-be-forgotten) British species *C. bellidiooides*, which at first I supposed it to be, from its bright vermillion-red globular tubercles springing from the edges of its tiny cups. *C. retipora*, often found in large tufts in undisturbed spots, is one of the most elegant of lichens; its regular reticulated open structure is wonderful. A few curious fungi new to me I also obtained; and in a still-water bend in a streamlet I came upon a large mass of that peculiar fresh-water alga, *Batrachospermum moniliforme*—the only place I ever found it in New Zealand.

"At 3 p.m. we crossed the sandy desert called Te Onetapu—a most desolate and weird-looking spot, about two miles wide where we crossed it—a fit place for

Macbeth's witches, or Faustus's Brocken scene. About it, too, the old Maoris have many peculiar stories and superstitious fears, some of which I have no doubt are agglutinated around a nucleus of reality. Here and there burnt logs lay, scattered and embedded in the volcanic sand, as if where a fiery eruption from the neighbouring volcano had issued forth in times long past upon the then living forest. I noticed also that much of these anciently-[492] charred logs and pieces wore a highly-polished and semiglazed appearance, as if occasioned by the ever-drifting sharp sand. I was so struck with the peculiar exterior of some of the half-burnt timber, apparently so aged—or of old time—and yet retaining all its vessels and ducts, that I collected a few specimens, and subsequently sent them to England for high microscopical examination. On the edges of this lonely barren desert a lovely *Gentiana* flourished in all its undisturbed beauty—probably *G. pleurogynoides* (another fine garden-flower); also *Celmisia spectabilis*, most luxuriant in gloriously fine tufts or tussocks; and with it grew a much smaller and different-looking species of *Celmisia* (*C. glandulosa*), for the first time here found, and both species tolerably plentiful. Several times during this day were those exquisitely pathetic words of the poet Gray, so highly suitable to the place and scene, feelingly uttered by me:—

“Full many a flower is born to blush unseen,
And waste its sweetness on the *desert* air.

Very curious also was the formation, or, more correctly speaking, the state in which the old land was left in many spots on the west side of this desert. Table-topped

mounds, from 6 ft. to 10 ft. high, having perpendicular cliffy sides, each containing only a few perches of land, and rising like little islets separated from each other by the barren white sandy arms of the desert, were common. These mounds, or islets, abounded in a peculiar vegetation, which I greatly wished to know more of; but, alas! I was sadly pressed for time, and I was already more than prudently overloaded for the unknown mountain-journey before me. It was difficult, too, to climb up on them, although I did manage to get on two. Here I obtained an elegant dwarf *Dacrydium* (a "pine" tree, allied to the large Rimu = *D. cupressinum*), rooting up a few old trees of 1 ft. or 18 in. high, in full fruit, for specimens—reminding me of the quaint yet symmetrical little trees so greatly prized by the Chinese for their gardens. Rain overtook us shortly after our crossing the desert, which we were sorry for, but there was no help for it, there being no kind of shelter nor water at hand; so we travelled on in the pelting rain, which was from the south and in our faces, getting wet, weary, and dispirited, eagerly looking out for a fit halting-place, but finding none. To make matters worse, our guide more than once told us he was "all at sea" as to the proper course, because the thick rain hid the hills on all sides (and everything else) from his view, so that he could not see the landmarks. We kept on, on, on, however, till 7 p.m. (dark), when, finding water, we were obliged to halt in a narrow deep gully by the side of a *Fagus* wood, where everything around for miles of fern and [493] scrub had been very lately burnt off. We had been travelling through this "black country" for more than an hour, in hopes of seeing its end, but in vain. Here, where we were,

we could not find a level spot on which to put up our tent, so, in the darkness and the rain, we were obliged to dig away with our axes on the steep side of the hill before we could set it up. That night was a terrible one of wind and rain, insomuch that we expected every moment to be smothered in our half-pitched tent. Few of us slept that night.

"20th.—Our most wretched night was followed by a dirty, lowering morning, with furious wind and heavy rain: it was also bitterly cold. We were here caught in a southerly gale in one of the worst spots possible in the whole North Island of New Zealand, and we could not help ourselves. To retrace our steps and go back to Taupo (over Te Onetapu Desert) our guide flatly refused, and my natives joined him, he saying that high open desert-sand was now covered with snow, and that from the falling snow and sleet he could not tell the course—which, perhaps, was really the case. From him we had the story of seventy men having been once lost at one time in attempting to cross that place in snowy weather.

Murmurs, loud and deep, throughout this long and dreary day reached my ears,—of my having been the means of bringing on this weather through my uprooting some small trees (*Dacrydiums*), and my crossing the "sacred" desert without first observing certain superstitious ceremonies, and my sacrilegiously eating some *Gaultheria* berries while crossing it, which the guide had detected, &c. The worst to me was—(1) That I could not get anything whatever to lay on the wet mud floor of my tent (nor fern, nor grass, nor leafy shrubs were there to be found; all had been destroyed by fire, the very lower branches of the *Fagus* trees in the wood before us having

been scorched); (2) that we had scarcely anything to eat; (3) that my specimens were becoming spoiled, which caused me to fret pretty considerably; and (4) that, at the rate it was then raining, when the gale should abate the rivers we should have to cross would be unfordable for some days. As the day began, so it closed—no change whatever in the weather, save that even about us, at our considerably lower altitude, the rain was changed to sleet and snow.

“I shudder *now*, while writing this, in thinking of that wretched time, though more than forty-six years have since passed.

“Often enough did those highly-suitable words of my favourite old poet, Ossian, cross my memory: ‘It is night; I am alone, forlorn on the hill of storms. The wind is heard on the mountains; the torrent pours down the rocks. No hut [494] receives me from the rain; forlorn on the hill of winds’—(‘Songs of Selma’)—their suitability being so much the more increased through the superstitious talk and fears of some of my natives, who insisted on it that the sounds they heard between the fitful ravings of the blast among the trees were not merely those of the trees creaking, and of the denizens of the forest—parrots, owls, and wood-hens—but of the justly irate *patupaiarehe* (wood-nymphs or fairies), or of the ghosts of the dead—just, indeed, as Ossian has it; and Schiller laments in ‘Wallenstein,’—

“Alas! the old fabled existences are no more;
The fascinating race has emigrated.⁸¹¹

“21st (Sunday).—Another wet and uncomfortable day. The wind, however, had lessened a little, and we could manage to make up a fire, which we could not do yesterday. Not really knowing how far we were from help, I could only allow two teacups of rice for all my natives (six in number) for breakfast, and two also for dinner; and for supper *one* cup of rice was all that could be spared, which, with a few scraps of bacon fat and a little salt, made a mess of pottage! At consultation this evening we agreed to start early this morning. I privately requested Paora⁸¹² and two other of my natives from Hawke’s Bay whom I could trust to keep a good watch over our Taupo guide during the night, lest he should give us the slip, a trick I had been served more than once in former travelling. Indeed, to prevent this on this occasion I had determined, if needs be, to bind him till morning.

“22nd.—Up early this morning, and left our wretched encampment at 6 o’clock. The frost was heavy, and it was bitterly cold, insomuch that we could scarcely fold up the tent. Unfortunately, however, the ice on the many pools and streamlets we had to cross after gaining the brow of our hill was not thick enough to bear one’s

811 WC: Die alten Fabelwesen sind nicht mehr, Das reizende Geschlecht ist ausgewandert. SCHILLER: “Wallenstein.”

812 WC: This man (Paul), then one of my baggage-bearers, a fine, tall, stalwart, and useful Christian native, is the same as Paora Kaiwhata, a chief of note, well known to Hawke’s Bay settlers, who died a few months ago.

weight, and so we were obliged to go through it. Crash! souse into the cold water, of which my poor companions with their naked feet loudly complained. Here, in one of these watery hollows, and partly submerged, grew a little shrubby plant which I had not before seen, and never again found. It proved to be a new species of *Logania* (*L. depressa*). It cost me a good wetting and cold shivering to get specimens. It was nearly 9.30 before we halted to breakfast, which we did on the banks of the River [495] Moawhango (now a swollen rapid), where we roasted our roast—a few potatoes which we had carefully reserved—my natives having then said they could travel better on roasted potatoes than on rice. We travelled on pretty steadily all this long day until 8 p.m. without halting, when we threw ourselves down among the fern quite exhausted and spiritless, not knowing how much farther we had to go before we should reach this long-looked-for Patea. Our guide, who had been lagging behind, although he had no load to carry, had sunk down some time before, declaring he could go no further, being faint through hunger; so, taking from him the course we had to steer (as far as he knew), we left him, believing that a good nap would refresh him. After a while we arose from our fern couch hunger-impelled, and, having broken off the tops of the branches of the large many-headed cabbage-trees (*Cordyline australis*), which grew close by, and which the light of the rising moon revealed, we made a fire, and roasted the stalks of the young leaves, which, though both tough and bitter, served to allay our pangs. The *Cordyline* trees of these parts are the largest I have ever seen. They are not only high and many-

branched, but bulky also in the trunk.⁸¹³ The whole route this day was very hilly and broken, with occasional heavy entangled virgin forests without the least vestige of any track, we having been obliged to keep much on the higher ground so as to avoid the streams in the valleys, which were overflowing, rapid, and dangerous. During this long day's march I subsisted on a *raw* potato, which I kept nibbling, and a few *Gaultheria* berries; in addition thereto following out the Maori plan of 'hauling in the slack,' in nautical language, or, in other words, of tightening up my travelling-belt, which I have always found in times of severe hunger to be of great service, although it makes it dangerous for stooping low. That night we all slept as we were in the fern around the fire.

"23rd.—Very early this morning our 'guide,' following our track, came up to us before we were well awake, and finding from him we were at last really near the Patea villages, I, after he had rested awhile and eaten some roasted cabbage tree leaf-stalks, sent him on to the nearest village to inform the natives of our arrival and of our hungry state. A long night's sound sleep had done him a deal of good, he appearing a different man altogether, although he had had nothing to eat, and had passed the night in the open without a fire; tobacco, also, at that period not being in use. At 6 a.m. we also managed to hobble after him, stiff enough, following his [496] track, and by 8 we were loudly welcomed into a

813 WC: I afterwards measured one in which a native of Patea had made a house or room, and fitted it with a door, to keep his tools, baskets, &c., in. I went into it, and stood upright in it. The tree was living, and healthy. I took down its exact girth—20 ft. 2 in.

little plantation village, where we found a feast awaiting us, in baskets of smoking-hot cooked potatoes, to which we all did justice."

I will only add that on the day before I collected several new and interesting plants, which with all those others named were described and published, with drawings, by Sir W.J. Hooker in his "Icones Plantarum," and by Sir J.D. Hooker in his "Handbook of the New Zealand Flora."

APPENDIX.

COPY of the Letter written by Mr. Lys to the Editor of the *Hawke's Bay Herald*, Napier, with reference to Mr. Collie's Ascent of Ngauruhoe, and the Loss of his Camera there.

SIR,—Having noticed several allusions to a camera belonging to Mr. Collie having been found at Ngauruhoe, and two of your correspondents having mentioned my name in connection therewith, I beg to supply you with the true facts of the case.

As near as I can recollect, it was in 1877 that Mr. Collie and myself started for Ngauruhoe, intending to thoroughly photograph the mountain and vicinity, not making any secret of our intentions, as, although we knew that the volcano was *tapu*,⁸¹⁴ we believed we should meet with no opposition. But on arriving at

814 WC: Placed under ceremonial restrictions, rigidly preserved.

Erehwon, Mr. Birch's homestead, we were met by a Maori, who bore a letter from the chiefs of the district warning us to go back, as we would not be permitted to take any photographs of the sacred mountain, which was strictly *tapu*. It was but a short time since they had stripped Mr. Conolly, and we came to the conclusion that we would return to Napier, and try again in the following autumn; which we did, taking every precaution to keep our intentions secret, and we succeeded in reaching our goal without the natives being anything the wiser. Mr. Collie and myself for three weeks camped at the base of Ngauruhoe, taking views of the mountain and surrounding scenery. We had taken part of our gear, including the camera, up into the crater, intending to follow next day with the balance of our necessaries; but next morning whilst having our breakfast we were surprised by a party of six natives, who manifested great curiosity as to our reasons for being there, and also as to how we had found our way there. I should tell you that we were prepared for our visitors, in that we had our pictures "planted," and also the bulk of our goods were in another camp, and our money had also been sent away to Mr. Birch's, in Patea; but we were expecting a man to arrive every day with the horses for us to depart when we should have got our views of the crater. The [497] Maoris talked of taking us to the king, of killing us, and various pleasant alternatives, but agreed at last that in consideration of a sum of £20 they would overlook the sacrilege done and allow us to depart with our baggage. We drew out an agreement to that effect, which we signed; and then they wanted cash down, which we had taken care was out of our power to comply with by

having no money with us. Eventually it was agreed that we should try to get it from Mr. Birch. We were going to get it, leaving our baggage as security—a by-no-means inconsiderable quantity, as we were using the wet process, making a load for two pack-horses. I went with three of the Maoris that afternoon up to our second camp, and showed them our gear, my fellow-prisoner (Mr. Collie) being guarded by the other natives. We arrived at their camp after dark that evening, the said camp being in the bush between Ngauruhoe and Ruapehu, and consisting of a large fire, with boughs of trees thrown on the ground for bedding. It was a novel yet not unpleasant experience for me, as it was a glorious night in May, with the moon at the full. The snow-covered mountain in front of us presented a sight worth going a long distance to see. In the morning, after some breakfast, consisting of weka⁸¹⁵ and potatoes, and some tall talk on both sides, Mr. Collie proceeded to Mamoenui, an outstation or shepherd's hut belonging to Mr. Studholme, on the edge of the desert, some twenty miles from our dusky captors, and there we waited for our horses, as we had to leave our camp on foot. Our horses arrived next day, and the man who brought them and myself started for Ngauruhoe as soon as it was dusk, on foot, intending to make a dash up the mountain for the camera and pictures, which, as I have said, had been hidden; but the fates were against us, as there came on a heavy gale from the south, and no man could have ascended the mountain in safety. However, I got our plates, although the Maoris had removed all the rest of the gear; and the following

815 WC: Wood-hen, probably *Ocydromus greyi*.

summer we ascended the mountain and found that our camera had been destroyed by eruptions of the volcano and the weather combined. That is the truth about Mr. Collie's camera; and I can say that neither of us was inclined to run from noises or shadows, as we passed a night in the crater on our second trip.

Apologizing for trespassing on your space,—I am, &c.,
F. E. LYS.

Hastings, 3rd June, 1893.

In addition to the foregoing account I may add (having recently had an interesting interview with Mr. Lys) that those [498] Maoris did not get their ransom of £20, Mr. Collie and Mr. Lys having managed to leave very early the next morning for Napier; consequently they took possession of all they found at the camp where they had discovered the two Europeans.—W.C.

1893 Notes and Observations on M. A. de Quatrefages Paper “On Moas and Moa-hunters,” republished in Vol. XXV., Transactions New Zealand Institute.
Transactions of the New Zealand Institute 26: 498-513.

[*Read before the Wellington Philosophical Society, 13th December, 1893.*]

Every kind of evidence is made to tell by writers who have a theory to defend.

MAX MÜLLER: “The Gifford Lectures,” 1891, p. 428.

It very frequently happens that he who defends the truth does not gain the victory, since the hearers are either prejudiced, or have no great interest in the better cause.

CLEMENT: “Recognitions,” lib. ii., c. 5. (A.D. 300).

A generous friendship no cold medium knows,
 Burns with one love, with one resentment glows.

POPE: “Iliad,” book ix., l. 275.

IT was with no small amount of surprise that I saw in vol. xxv., Trans. N.Z. Inst. (lately to hand), that old and long paper of M. A. de Quatrefages on the Moa (*Dinornis* species) again served up, and that, too, in a brand-new translation. That paper having already appeared in full in

an English translation,⁸¹⁶ in such a respectable, old-established, and well-known first-class scientific serial as “The Annals and Magazine of Natural History” nearly ten years ago, surely there was no necessity for (I might truly enough say, no benefit to arise from) it being republished in the Transactions, especially as it contains many errors which, possibly, were not fully known to the writer at the time, but which are almost sure to accompany all such heterogeneous and voluminous compilations, particularly when strung together by one who does not fairly grasp his subject; and still more so when he has a former and pet theory, or “fad,” of his own to supplement and defend. And, as the one eminent man against whom that paper is particularly levelled is no longer among us to reply to it—which, however, I well knew he fully intended to do—and as I am in full possession of [499] this knowledge, as I shall show, I deem it a duty incumbent on me to write this paper on behalf of my deceased friend, to do his memory scant justice in this matter. Indeed, in my adducing his own *ipsissima verba*⁸¹⁷ on this subject, it may be said of him, as of others before him, “*per illam defunctus adhuc loquitur.*”⁸¹⁸

816 WC: Which, moreover, was highly eulogized by Mr. Maskell as being a “good translation,” in his paper on it: “Review of a Paper on the Moa by M. A. de Quatrefages,” read before the Wellington Philosophical Society, 3rd September, 1884. (*Trans. N.Z. Inst.*, vol. xvii, p. 448.)

817 the very words.

818 and by it he being dead yet speaketh. (Hebrews 11:4).

And here I cannot refrain from observing that this fresh and uncalled-for move seems somewhat ungenerous on the part of its promoters, as the gist of M. de Quatrefages' paper was well known to be levelled against Sir Julius von Haast, now no longer among us—a man who had so faithfully and zealously served science, even beyond his natural powers; and so, like many others who have preceded him, in New Zealand and in the South Pacific, given his life to her cause and to the colony.

The late Sir Julius von Haast and myself had long been correspondents on very friendly terms, and in the early part of the year 1885 he wrote to me respecting this very paper of M. de Quatrefages', then lately republished in its English translation in the August and September numbers (1884) of the serial mentioned,⁸¹⁹ informing me of it, and asking me to assist him in his replying to it, which I promised to do. Unfortunately, this was not carried out, through Sir Julius being appointed the Commissioner for the New Zealand Exhibition in London, and consequently having to leave New Zealand soon after, for which duty, too, he had to make extensive preparation prior to his leaving New Zealand; and then his sudden premature death at Christchurch so very soon after his return to the colony.⁸²⁰ I shall give verbatim copies of the notes and memoranda that passed between us, so far as

819 WC: I cannot understand how this paper, then first published in an English translation, could be known to Mr. Maskell so early as 3rd September in that same year.

820 WC: Returned to the colony 17th July, 1887, and died on the 16th August.

they relate to this subject. Fortunately I kept copies of my replies to him:—

Christchurch, 23rd March, 1885.

MY DEAR MR. COLENZO,—

... As I told you, Professor Quatrefages rather handles me roughly about the Moa age. However, as I know I am on the right track. I intend to answer his paper fully; but, in order to do so, I want the help of my friends. Enclosed I send you a few questions, to which I wish an answer at your earliest convenience. It is only to strengthen my hands—to show that all are not unanimous in believing that the Moa became only extinct in the last hundred years, as I told you verbally....

Ever faithfully yours,
JULIUS VON HAAST.

The questions referred to:—

1. Do you know any reliable Maori traditions about the Moa?
2. Do not all, or at least some, of these traditions appear to have [500] been brought by the Hawaiki immigrants from their former home, as, for instance, the accounts of the great lizard (crocodile?)?
3. If the traditions of the *Moa* are applicable to New Zealand, *when*, according to them, became the Moa extinct?
4. Are there any reliable traditions that when the immigration or immigrations from Hawaiki took place another autochthonous population was inhabiting New Zealand?
5. To what race did it belong?

6. Had the Hawaiki immigrants, or their predecessors, a frugivorous dog? When did it become extinct or alter its habits? Are there any traditions about it?
7. Are there any traditions when greenstone was first used by the natives?

JULIUS VON HAAST.
Christchurch, 19th March, 1885.

Napier, 31st March, 1885.

MY DEAR PROFESSOR VON HAAST,—

Thanks for your kind note of the 23rd inst.... I have endeavoured to answer your questions, but, I fear, not satisfactorily, either to you or to myself; but if you will patiently look into those old papers of mine, as noted, you will, I think, gain some information.

I feel at times not a little vexed with the powers that be, when I reflect how much, how greatly, I have been hindered and thwarted in my two principal works—the Maori lexicon, and my papers on old Maori lore and matters. They (or their successors) will be also vexed *hereafter*, but that is no solace to me. They ought to have given every encouragement, but...

I am, my dear Professor, yours faithfully,
W. COLENSO.

P.S.—I may also add, and that for *two* reasons, that the thought has crossed my mind that you had forgotten (?) what I had written on the Moa in the paper referred to: perhaps, when you had looked at it, you supposed it to be only my old *original paper*, reprinted from “The Annals of Natural History,” with which it does begin, but a great deal of freshly-obtained information was added. My *two*

reasons are: Buller made a *similar* mistake last year, in his presidential address at Wellington, mainly, too, on the Maoris, when he said that "no one had yet written a paper on the subject of their poetry," &c. I was ashamed on reading this, and pointed out to him my long paper on that subject, with translations of songs, &c., in vol. xiii., Transactions. In reply, Buller said he had "quite overlooked it." (2.) When Remenyi was with me last Sunday we were on this subject (Maori poetry), and I lent him that volume to read the said paper, and my so doing has brought Buller's omission fresh to memory; hence also this.—

W.C.

1st April, 1885.

Answers to Professor Von Haast's questions *re* the Moa, &c.:

1. What I had gleaned I gave in my paper on the Moa, Trans. N.Z. Inst., vol. xii., pp. 80 *et seq.*
2. No; I don't believe in that myth of Hawaiki immigration as containing anything real (material, objective)—*i.e.*, appertaining to the Sandwich or to any other islands. (See legend of a saurian *pet*, Trans. N.Z. Inst., vol. xi., p. 100.)
3. See answer to question No. 1.
4. I don't believe in that *objective* migration; there are *such* stories, however, *re* autochthons—strange, quaint, simple, and contradictory—showing their antiquity, but of no value [save to show their utter ignorance].
5. This question cannot be answered in one word or sentence, as you [501] would like, simply because all New Zealand, from the very night of their history, was occupied tribally—that is, as deadly foes—after the

manner of Cain and Abel; the tribes, too, being numerous, and often changing their names, and becoming extinct through warfare.

6. I scarcely clearly understand this. (1.) I don't believe in that *objective* Hawaiki; yet a tradition says a dog came with them, and swam to shore before their canoe touched land, through smelling a dead whale stranded on the shore (Trans. N.Z. Inst., vol. x., p. 154). (2.) The ancient Maori dog was certainly *not* frugivorous in a country *sans* fruit; rather *omnivorous* (see my paper on their dog, Transactions, vol. x., pp. 139–150). It was pretty numerous in Cook's time, and after, as I have shown. Cook's people bought them for food, being a domestic animal, and never too plentiful owing to the great demand for it—for its flesh and hairy skin—for feasts and for chiefs' garments; and always following the fate of its masters in their frequent wars, it gradually became lost; partly, too, owing to the early introduction of the foreign breeds of dogs, which became more and more requisite to enable the Maoris to catch their wild pigs for barter, &c. There are traditions about the dog, some queer and strange (vol. x., p. 154).

7. There are also traditions about the greenstone and its early use, but very short and casual (*e.g.*, see Trans. N.Z. Inst., vol. xii., pp. 80, 81).

Christchurch, 11th April, 1885.

MY DEAR MR. COLENSO,—

Your welcome letter of the 31st and 1st April came to hand, together with the answers to my questions, for which my best thanks. This, together with your papers, will help me a great deal. I would at once have sent you

the two numbers with Quatrefages' papers, but they were out. I have sent them with this mail, together with Buller's pamphlet, in which the tradition about the pet Moa is given. You will see that he makes light of it. Now, will you do me this great kindness, and read Quatrefages' paper carefully, and give me some notes on it; also mark with pencil numbers where you wish to draw my attention. Any point you can throw light on is of great value to me in my answer. Please show the paper also to our mutual friend Locke, with my kindest greetings, and ask him to give me *his* views upon the same, as well as on Buller's. The pet Moa must have been *very small* or it could not have been retained by a man with a broken leg. Nobody regrets more than I do that by stupidity and want of interest your valuable labours upon the Maoris have been retarded; but I have still great hopes that you will take them up again with great vigour. What I have seen of you has shown me that there is still any amount of vitality and "go" in you, and so I have not yet given up all hopes. I have, unfortunately, no specimen of *Hookeria flexicollis*, or I would send it with great pleasure.

Ever faithfully yours,
JULIUS VON HAAST.

P.S.—The pamphlet sent was also very welcome. However, I have not yet found the time to read it *con amore*, as the lectures have just begun, and I have my hands full with work.

This last letter was followed by a telegram:—

Christchurch, 18th May.

Please return books. Urgently wanted.

JULIUS VON HAAST.

Napier, 18th May, 1885.

MY DEAR PROFESSOR VON HAAST,—

Your telegram of this morning, requesting *instant* return of books you kindly lent me, I have received, and respond at once. I would [502] that I had got it on Saturday morning last, then your books could have gone by mail-steamer; now, I suppose, they must crawl thither by overland mail to Wellington.

I regret to say that I have *not yet thoroughly* read Quatrefages, while Buller's pamphlet I have not looked into. When your packet of books arrived here, about one month back, I was absent in the Seventy-mile Bush, whence I have only *recently* returned to Napier. Your kind letter was sent thither to me, but not the books; and, as you did not say in it that you wanted the books returned early—but, on the contrary, that “your lectures had just begun, and your hands were full of work,” and that I was “to lend the books to our mutual friend Locke” (who is still absent at Gisborne, and expected here, I believe, next Saturday)—I was in no hurry, having, too, *lots* to do after my month's absence in the bush.

However, I have detected two or three small things which I note. There are more, no doubt. I do not admire Quatrefages' style; he, too, evidently fully believes in the legendary migration (indeed, like others, *gives the islands whence they came*), and therefore does all he can in support of that story. One thing, however: I notice that

Quatrefages *never once* refers, or in any way alludes, to my *second* and exhaustive paper on the Moa (in Trans. N.Z. Inst., vol. xii.), while he does to others (*e.g.*, Travers's, Stack's, and John White's) whose erroneous statements I had in that paper refuted. He also (in a note, p. 168) calls the attention of writers and authors to my *later* papers in vols. xiii. and xiv. Transactions, but *that one volume he entirely overlooks*; can it be designedly, or had he not got a copy of that volume to refer to? He also, I think, ignores my paper on the New Zealand dog (vol. x., Transactions), where, too, he would have found something—or *all that is known*—respecting that animal. Another thing that Quatrefages has done (which I greatly dislike) is the taking-up with everything—every strange story, *no matter by whom written or stated*—by “the man in the street,” or (as I told M. Bastian when here) “by a mere low billiard-room marker—a fellow of only a short time in the country”—and then putting all together as of *equal authority!* hence I withheld mine.

I regret you must have your books right off. I shall write to London by this week's San Francisco mail for copies of Quatrefages' paper. As I said to you before, look closely into my papers on the Moa (*second* part), the dog, &c., &c. Even the stories (legends) will yield you much. In vol. xi., pp. 95–100, you will have a full account of the monster *pet* saurian, while another worthy had a pet whale on which he rode through the deep; others, too, performed similar feats on albatroses; why not a legendary pet Moa? In haste I close. Beware of trusting to second-rate authorities in Maori matters.

Believe me, ever yours faithfully,
W. COLENSO.

[Enclosure.]

Brief and rough memoranda and notes of remarks (unfinished):—

P. 134. Mr. Travers and J. White: “35 years.”—See my paper on Moa, vol. xii., p. 103 *et seq.*

P. 134. Maning’s “proverb.” Never heard it. *Greatly doubt it.* “*Ngoikae*” no known Maori word.

P. 134. “Two against two, like the Moas.” (J. White again.) See p. 95, *l.c.*

“Tautauamoa—a dispute about a piece of land (*moa* = bed) in a cultivation; a quarrel between a few of the same tribe or village; a private quarrel.” Nearly all this paragraph of M. Quatrefages’ is most strange to me.

P. 160. (Speaking of *me*). “I find no one but Mr. Colenso who *has accepted* [*sic*] this doctrine as absolute.” [503]

Compare with p. 161 (speaking of *you*): “In his ‘Geology of Province of Canterbury’ *he formally adopts* Mr. Colenso’s views.”

P. 161. Mr. Stack and his *Moa-feathers*. So Mr. Locke, and so J. White (all nursery tales). See pp. 82, 98, 99, *l.c.*, where I worked out Mr. Locke’s relation.

P. 162. “Hair purely Melanesian.” *What?*

P. 164. “*Dog brown or yellowish* colour, with *long* ears,” &c. Our earliest voyagers say, “Black, and also white, and particoloured, with straight prick ears.”

P. 164. *Note.* The *whole* of this note is *not in the original Maori text*, as published by Sir G. Grey. I copy correctly that portion:—

“Ka u mai hoki to Porua waka a te Ririno, na, ka patua nga kuri e rua, kotahi i taona, kotahi i haematatia, ko Whakapapatuakura i taona, ko Tangakakariki i haematatia, a ka puareare ka whakaturia nga tuaahu, i whakaturia hoki nga toko o te atua, kia ngarea putia ai, ko te maro o te atua, ka takapauria, ka whakatara te atua ka mea, ‘Nau mai e te atua, ekore au e whiti ki rawahi, nau mai ka whiti ai au.’ Katahi ka maoa te kuri ra, ka poihoa, ka mama tama i te riri, ka haere ka whakaturia nga urutoko, Te pou kei runga to pou e Rangi, kei a Atutahimarehua.”⁸²¹

N.B.—*Nothing* said about “other dogs,” neither of “spirits,” nor of “gods” (plural); nor of a “sacrifice”; nor of “wearying spirits”; nor of calling on *them* for some *omen*; and their (the Maoris’) call, or word, is simply, “Draw hither, O the demon; I cannot cross over to t’other side; draw hither [and] I shall cross over,” instead of the long sentence (of six lines), and nothing more implied. And such is not infrequently the case in that translation—*passim*, the plain, good Maori is often added to, dressed, and garnished.

P. 164. “Moreover,” &c. *Flavour* of flesh of dogs *far-fetched*.

P. 167. J. White’s (!) and Mr. Travers’s story of the origin of the name of a hill on the East Coast, from a chief receiving a kick from a Moa; and M. Quatrefages naturally remarks, “We see how all these popular reminiscences agree.” (*Bien bon!*) This strongly reminds

821 WC: Copied in full from Grey’s *P.M.*, that you may get it rendered by Rev. Mr. Stack, there with you.

me of Taylor's (and others') mistakes *re* Tongariro, Puareinga, Rangitoto, &c., &c.; but J. Wh. and *T. forgot* (?) to say that such was in the *olden* time, and that, on his being kicked down the hill by the Moa, his foot striking a rock split it asunder, and hence the outlet of the present river through it. (*Jam satis.*) For the "kick" and its probable origin, see Trans., vol. xii., p. 103.

P. 168. *Re* "mists of hills and fat of moas" and M. Quatrefages' *long* note thereon! J. White's *usual* magnifying and embellishing. *First* paragraph, all from the *short*, common, ancient saying, vol. xii., pp. 84, 85. N.B.—Sir D. McLean's testimony thereto, after long and *general* inquiry throughout the Island extending throughout years, which he kindly undertook for me.

In a week after my last letter to Professor Von Haast I received the following telegram from him, sent from Wellington:—

Rev. W. Colenso, Napier.

26th May, 1885.

Thanks for notes. Will return Buller and Quatrefages in a fortnight.

JULIUS VON HAAST.

MY DEAR DR. VON HAAST,—

Napier, 5th June, 1885.

... *Imprimis*: I wished to say, at once, Don't send those books here to me, but, as Locke is going to Wellington (to the Parliament), let *him* see them first. I have talked with Locke about both dog and [504] Moa, and he thinks

(with me) that you would find *all that we know* in my two papers in Transactions.

I find that you are going to England anon. I wish to ask, if I send you a few Moa-bones whether you would name them for me. I have not many, and, with the exception of *one* bird, all single bones. I would not send you *all*—you are far too busy—but only a few, and in good condition—say, of three or four species; and perhaps those (3) of one leg of another from Poverty Bay. Of course, I pay all expenses up and down.

Believe me, yours very truly,
W. COLENSO.

MY DEAR MR. COLENSO,—

Christchurch, 9th June, 1885.

Since I have accepted the Commissionership of the London Exhibition I have been several times to Wellington making the necessary arrangements. Now everything is settled, and the circulars are going all over New Zealand. I was much obliged to you for returning me the two books. Quatrefages was wanted by the secretary, but I can soon get it back, and shall, according to your wish, first send it to our mutual friend Locke. I need scarcely assure you that I am very grateful to you for the most interesting notes and hints you have given me, which, no doubt, will materially assist me in my task to give Quatrefages the proper answer.

I hope you will allow me to take the bronze bell with me for exhibition to the London [Exhibition (word omitted in note)], because I am sure it will create a great deal of interest, and of course I shall take the greatest care of it.

Concerning your Moa-bones, please send me the whole lot; I shall name them for you with the greatest pleasure, and, if you like, make up your collection with that; you have at least the principal species all represented.

Ever faithfully yours,
JULIUS VON HAAST.

MY DEAR DR. VON HAAST,—

Napier, 6th August, 1885.

... In your note you say, for me to send on my (few) Moa bones to you to be named. I thank you for this; but *may I do so now*, and to Christchurch, or are you too busy? A single word by "wire" will do.

Then, you ask for the bronze bell to take to your Exhibition. Would not a cast serve? Dr. Hector got several made, and he kindly sent us one here for our Museum. I mention this, as Dr. Hector positively refused to run the risk of taking it to the Melbourne Exhibition, saying, "It ought not to go out of the colony." ... I suppose you have *seen* Locke, and perhaps given him the "Annals" containing Quatrefages' paper.

Believe me, yours faithfully,
W. COLENZO.

Dr. Von Haast's reply, dated "Christchurch, 14th August," referred wholly to specimens for the London Exhibition, merely adding at the close, "Locke has got the 'Annals' now." To that letter I replied on the 28th August. In *his* following and *last* letter Professor Von Haast mainly writes on the specimens of Moa-bones I

had sent him, and that on his returning them to me. I omit all that, and merely copy from his letter what he says about his preparations for leaving New Zealand, and also concerning the antique bronze bell, this article having been frequently mentioned in our former letters. [505]

Canterbury Museum, Christchurch,
12th October, 1885.

MY DEAR MR. COLENZO,—

Your welcome letter of the 28th August came to hand in due time. I think I wrote to you that the box with the Moa-bones had arrived, but I have been so overwhelmed with work that I have hitherto not found the time, but will now in the first free moment proceed at once to business. I have examined your bones at various opportunities and found them extremely difficult, as I have no material from the North Island for comparison, and Owen having only described but one type-specimen of each of his so-called species; consequently I only can give you my own personal views.... [Here follow his descriptions, &c., of the bones.] As our court will be so crowded with industrial exhibits, my space for other scientific things will be much curtailed. Moreover, I do not like to take the responsibility about the bronze bell; but I should like the early prints, and some specimen sheets of the Maori dictionary. I hope and trust you will enjoy good health, so that this grand work will be finished by you in comfort. Your case with the Moa-bones will be returned by the first steamer.

Yours faithfully,
JULIUS VON HAAST.

The sequel to my self-imposed task and long paper is soon told. In due time I received from London the copy of M. De Quatrefages' paper, but on its arrival, Dr. Von Haast being in England, and I otherwise engaged, I did not again take it up, and so it has been down to the present day, for I had written largely and (as I thought) exhaustively on the Moa in my paper in vol. xii., Transactions, and, having done so, I had done with it. Further, I awaited the return of Sir Julius von Haast, and then when he did return to Christchurch he so shortly after unexpectedly died.

Before, however, I quit this subject (of the Moa), as I am never likely to write it over again, and as I have shown how translations from Maori have been amplified, and more than once mentioned Mr. John White and his manner of florid translating Maori into English, I would leave on record a notable instance of his dealing in this important matter of the earliest and only mention of the Moa in Maori legendary narrations.

In my paper on the Moa (*l.c.*, Transactions, vol. xii.) I had particularly referred to the short ancient legend of Ngahue, and the casual mention there of the Moa in the original Maori,⁸²² and the grave omission of the main (?) portion of it relative to *the Moa in the English*

822 WC: Grey's "Mythology and Traditions of New-Zealanders," 1st ed., p. 68; 2nd ed., part ii., p. 70.

translation.⁸²³ I give in a note below the simple Maori sentence containing these words in English.⁸²⁴ [506]

“Ngahue proceeded onwards, dwelt far off at Arahura, fixing his abode there (or, *stronger still*, permanently dwelling there). He broke off a portion of that fish (greenstone), and, carrying it with him, returned. Ngahue arriving at Te Wairere killed (or beat, or struck) the Moa; then (he) went (to) Tauranga (to) Whangaparaoa (and) returned to Hawaiki, and told he had seen the land whose riches (chief productions, *or* principal things) were greenstone and Moa.”

I now give John White’s rendering of that same story:⁸²⁵—

“Ngahue, at Te Wairere, *saw the bird Moa*, and killed *one*, and went back to Hawaiki and told the inhabitants of

823 WC: 1st ed., p. 133; 2nd ed., part ii., p. 82.

824 WC: “*A, haere ana*” (*a Ngahue*), “*noho rawa atu i Arahura, ka tuturu te noho i reira, katahi ka kowhakina mai e ia tetehi wahi o taua ika, ka mauria atu e ia ka hoki atu ka tae a Ngahue ki te Wairere ka patua te Moa, ka haere Tauranga, Whangaparaoa, ka hoki ki Hawaiki, ka korero kua kite ia i te whenua tonā kai he pouāmu, he Moa.*”

825 WC: “*Ancient History of the Maori*,” vol. ii., p. 187. As I have not yet read (nor even looked into) this work of J. White, now extended to six volumes—save only this second volume, and that by chance—I should perhaps briefly state how I came to look into this volume: through John White having kindly presented me this copy of vol. ii., on account of his republishing in it two of my old historical Maori legends (pp. 167 and 173), which he acknowledges in the preface. There may be more respecting this same very old story of Ngahue in the other volumes.

that land that he had discovered a country without human inhabitants, but where there was greenstone to be found."

And yet again (another version): "Ngahue returned to Arahura, where he *found* the *bird* Moa near the Wairere waterfall, and killed one and carried it in a *taha* or *ipu* (calabash), and went back to Hawaiki, and informed the people of that land of a fine land called Aotearoa which he had discovered."

And these two versions of that same story J. White gives as from two tribes—Ngatiawa and Ngatihau. Note the differences; premising that Grey's Maori version was old and early (*before* 1854), and, as Sir George says in his preface, obtained from the best Maori authorities.

In Grey's English translation little notice is taken of the Moa (just as in the original Maori); even its "killing" is omitted, although the *only* instance of the Moa being mentioned in any old story or legend: in J. White's (1887, nearly forty years after) the peculiar amplification—(a) the words "saw the *bird* Moa, and killed *one*"; and, again, (b) "*found* the *bird* Moa, and killed *one*, and carried it off in a *calabash*," &c.

It may be observed, "But J. White's English rendering is that of the Maori relations from two tribes" (pp. 170, 171, part ii., *l.c.*). Yes; but note in that of Ngatiawa:—

1. "Ka kite" (a Ngahue) "i te Wairere, i reira te manu nei te Moa e tu ana ka patua e Ngahue," &c. = Ngahue *saw* (or visited) Te Wairere (some high cliff), and *there a single Moa standing*. How closely this relation resembles that statement of the East Cape Maoris to me (January, 1838), of the *one Moa standing on the top of the*

*mountain Whakapunake; and [507] also that of the West Coast Maoris to Dieffenbach (1841), of the one Moa on Mount Egmont.*⁸²⁶

2. And so in that of Ngatihau, with the addition that the Moa (flesh, I suppose) was collected into a calabash by Ngahue (evidently knowing nothing of the *size* of the Moa).
 3. And in both traditions the word “manu = bird” is given, *a modern* addition, which is not in the older one of Grey’s. The syntax of these two Maori statements is not that of an old Maori, but of a *pakeha* = foreigner, stranger, and I believe to be John White’s own peculiar diction.
 4. Be that as it may, two things are clear—(1) The casual brief notice of the Moa as a thing of no importance in the *older* Maori version; and (2) the growth of the legend in the two *later* Maori versions of the same story.
 5. And then the *period* (*before* the so-called migration from Hawaiki) and also the *place* where the Moa was killed (in the South Island) are the same in all three versions, from which (their united narration) we may clearly gather—(1) the great antiquity of the story, and (2) the *one* solitary mountain Moa being only then met with in the South Island together with the greenstone; although Ngahue had also travelled largely in the North one, both in going and in returning.
- Again, note the peculiar use of this word “*kai*” in the older version quoted. (See note, p. 505.)

826 WC: *Vide Trans. N.Z. Inst.*, vol. xii., p. 102.

In a paper read before the Hawke's Bay Philosophical Institute⁸²⁷ in July, 1883, in giving several meanings of the word "kai," I have among them the following:—

"A very old meaning of 'kai' as a noun is movable property, possessions, goods, treasures, chattels—valuables in the estimation of the ancient Maoris" (*l.c.*, p. 97). And here we have a good example of it.

In comparing the two translations of M. de Quatrefages' paper I find very little difference between them; only to this modern one there is a long concluding narration tacked on and made a postscript to the older paper, written in May, 1889, and supplied, as M. Quatrefages states, by Sir Walter Buller, who had sent him a copy of the *New Zealand Times* of November, 1888, containing that peculiar story of comparatively modern Moa-hunting communicated by Colonel McDonnell. Strange that only such additional information ("fresh evidence," as it is called) should have become known to M. de Quatrefages after all those years, and just as strange that Sir Walter Buller should not have known of any other. [508]

My task is done. I did not intend to write another line on this subject of the Moa age, but in this same volume (xxv.), in the Proceedings of the Wellington Philosophical Society, are many observations made at different meetings of the Society by the members present on this theme. Some of them I am really sorry to find recorded there, because they are merely the old, old stories and tales which have long ago been answered, and

827 WC: Entitled "Three Literary Papers." A copy I had sent to Professor J. von Haast with my letter of 31st March.

shown to be untenable, and refuted, and therefore such should not be again resurrected. Indeed, in so doing, the truth—the “true facts”—will never be arrived at; and that true and proper remark of Max Müller (in his late lectures at Glasgow, as brought forward by me in a paper in this same volume, p. 496) is very applicable here: “What is of immense importance in all scientific discussions is the spirit of truth. To make light of a fact that has been established, to ignore intentionally an argument which we cannot refute, to throw out guesses which we know we cannot prove—nay, which we do not even attempt to prove—is simply wrong, and poisons the air in which true science can breathe and live” (“Gifford Lectures,” 1891, p. 81). And as I have read of those remarks having been made before (both in the back volumes of Transactions as well as in the Wellington papers of the day), I would, as a member of the Society, beg to be permitted to call the attention of some of our prominent speakers at those meetings to what they have said on this subject.

Mr. Travers, for instance, says, “We could not judge of this matter from the Maoris of the present day, *but fifty years ago they were familiar with the existence of this bird*” (*l.c.*, p. 531). Now, it seems very hard that such a statement (oft repeated too) should pass unnoticed. It was in January, 1838, that I myself first moved in this matter (as I have fully and clearly shown in my long paper in vol. xii., *Transactions*), and I left no stone unturned to glean something tangible about it—in travelling throughout much of the North Island, from Poverty Bay to Cape Maria Van Diemen (a zigzag course to *all* Maori villages as ordered), during which I now and then fell in

with chiefs who had seen Cook and also been on board of his ship, which would take back to another fifty years; by friends and acquaintances among Europeans settled and trading in various parts; by rewards; by young Maori chiefs returning to their homes and tribes from our head mission-station in the Bay of Islands; by letters to our Maori Christian teachers and catechists—and the result was NIL. And there were others succeeding me, fifty years ago, who also travelled much throughout this North Island (Dr. Dieffenbach, for instance), and their united report is exactly [509] the same—NIL. Why, then (may I not ask Mr. Travers) are we not believed? Why every year repeatedly bring up that old, old, and wretched remark, "that fifty years ago the Maoris were familiar with the existence of this bird," when the very ancient legend of Ngahue alone (above related) goes far to prove its incorrectness? (I feel this the more in its coming from Mr. Travers, who professionally knows well the difference between true and false facts, and how easy it is to adduce charges, however insignificant and erroneous, when defendant is out of Court.)

And just so, again, with Mr. Maskell. I really feel ashamed when I read (both on these and on former occasions) his illogical remarks, his strong affirmations, respecting not only the Moa age, but also the Maori legends and the very language itself, of all which, I beg to tell him, he really knows nothing. Surely Mr. Maskell must know full well the difference between legends and legends! Indeed, he says he does; and that, "whilst he thought little of Maori legends, he did value European traditions"—no doubt!—"and he well remembered hearing the late Sir F. Weld state often that when he

started from Nelson, somewhere about 1848, to make the first journey overland to what is now Canterbury, the Maoris warned him to be very careful of the large birds which he would meet with in the mountains, and which would kick him to death if they could. That was a tradition worth any number of Maori legends" (*l.c.*, p. 531; and again repeated p. 535). Now, I have already, nearly twenty years ago, shown the probable origin of much of that talk⁸²⁸—at all events, of its modern and foreign embellishments. But, I would ask, where is the "European tradition" here? Is not the simple relation by Sir F. Weld of what the Maoris had told him *their legend*? And where is the radical difference between this legend of theirs and that given by them to Dr. Dieffenbach on the same subject nearly ten years before?—namely, "The Maoris could not understand what induced me to seek to ascend Mount Egmont; they tried much to dissuade me from the attempt, by saying that the mountain was *tapu*—that there were *ngarara* (crocodiles) on it, which would undoubtedly eat me. The mysterious bird 'Moa' (of which I shall say more hereafter) was also said to exist there. But I answered that I was not afraid of these creatures of their lively imagination" (vol. i., p. 140).

No one would stand up more strongly for the true position of an expert in his own peculiar line as a successful describer of *Coccididae* (and of Mr. Maskell *in that capacity* we have good reason to be proud); but what would Mr. Maskell say, [510] or think (say) of me, were I, on any occasion when one of his favourite papers was

828 WC: *Trans. N.Z. Inst.*, vol. xii., p. 103.

being read, to speak of such in his *own* way, using his *own* language which he so frequently uses towards *us*—myself and other Maori philologists—who, if not equally experts, must certainly be allowed to know something more than Mr. Maskell of those Maori matters, to which we have given many years of time and research and study? I confess to feeling both ashamed and sorry when I read Mr. Maskell's statement *re* this paper of M. de Quatrefages (bearing in mind, as I have shown, the grave omission of many *true facts* from its pages), who said that “he was proud of having been the first to bring that paper under the notice of this colony several years ago in the pages of the ‘New Zealand Journal of Science,’”⁸²⁹ and now, with all its errors, omissions, and suppressions, actually bringing it forward again.

I trust that both Mr. Travers and Mr. Maskell, for whom I have great respect, will forgive me in my thus writing warmly on a matter in which I am so deeply interested, as, from my age, &c., I may never write again. The old Latin proverb is applicable here both to them and to me—“*Ne sutor ultra crepidam*”⁸³⁰ may we all be enabled to observe it.

And here I would communicate the very excellent and apposite remarks lately made by Professor Rudolph Virchow, in his Croonian lecture delivered before the Royal Society: “Who of us is not in need of friendly encouragement in the changing events of life? True happiness is not based on the appreciation of others, but

829 WC: Trans. N.Z. Inst., vol. xxv., p. 531.

830 The shoemaker should not go beyond his last.

on the consciousness of one's own honest labour. How otherwise should we preserve the hope of progress and of final victory in face of the attacks of opponents and the insults which are spared to nobody who comes before the public? He who during a long and busy life is exposed to public opinion certainly learns to bear unjust criticism with equanimity, but this comes only through the confidence that his cause is just, and that some day it must triumph. Such is our hope in our wrestlings for progress in science and art.... Happy is he who has courage enough to keep up or regain his relations with other men, and to take part in the common work. Thrice happy is he who does not lack in this work the flattering commendation of esteemed colleagues.”⁸³¹

In fine, the prolific root or cause of error with M. de Quatrefages, and with most of those who have written or spoken on this matter of the Moa—*i.e.*, of the Moa *age*—arises from their believing in the myth of Hawaiki and the migration therefrom, and in fixing that period at 500 years ago. To [511] me, having long and carefully considered the whole matter in its various phases and bearings, and having no pet theory of my own to support or vamp up, both are alike preposterous and void of true literal foundation. At the same time, there is concealed within them a deep esoteric meaning hidden and masked; not dissimilar, however, to, and possibly more reasonable than, what has obtained among other ancient and highly-civilised people concerning their origins. Much as Max Müller has truly and eloquently expressed it: “Language threw its web of metaphors around the truths of which it

831 WC: *Proceedings Royal Society*, vol. liii., p. 114: March, 1893.

spoke, and by a natural mistake men came to take the metaphors for facts.”⁸³² But on this deep recondite subject I cannot at present enter.

Lastly, I may observe that, in my long and exhaustive article on the Moa (so often referred to by me in this paper), I concluded it with the words of the celebrated Roman historian Tacitus, when writing on the *Phœnix*, a bird of great antiquity, which had given him, and other philosophers before him, an immense amount of labour. Tacitus, after recounting the many old stories respecting it, including recent tales, says, “The accounts of antiquity concerning this bird are enveloped in doubt and obscurity.... These accounts are not entitled to unqualified credit, and their uncertainty is increased by the admixture of matter palpably fabulous; but that this bird has been at some time seen in Egypt is not questioned.”⁸³³ That conclusion, made nearly 2,000 years ago, still recommends itself to us as a fair and a rational one. And yet I find, on lately reading in an ancient Roman author of note contemporary with Tacitus, just the very opposite remarks and conclusions respecting this same fabulous bird. And as such may be little known to this audience, the work containing it being scarce, and the subject somewhat analogous to this one of the extinct Moa and its age, I will briefly quote it:—

“There is a certain bird called a *Phœnix*. Of this there is never but one at a time, and that lives 500 years. And when the time of its dissolution draws near that it must

832 WC: “*Science of Thought*,” p. 328.

833 WC: *Trans. N.Z. Inst.*, vol. xii., p. 101, “*Annals*,” lib. vi., c. 28.

die, it makes itself a nest of frankincense and myrrh and other spices, into which, when its time is fulfilled, it enters and dies; but its flesh putrifying breeds a certain worm, which, being nourished with the juice of the dead bird, brings forth feathers; and when it is grown to a perfect state it takes up the nest in which the bones of its parent lie and carries it from Arabia into Egypt, to a city called Heliopolis; and, flying in open day in the sight of all men, lays it upon the [512] altar of the sun, and so returns from whence it came. The priests then search into the records of the time, and find that it returned precisely at the end of 500 years.” And then the author goes on to say, “Let us consider this wonderful type (or sign) of the Resurrection, when even by a bird the Lord of all shows us his power to fulfil his promise,” &c.⁸³⁴ Thus, again, proving to a demonstration how easy it is to swallow everything related, however strange, as veritable facts, and so jump to the desired conclusion.

Of course, my only reason for bringing these two notions together here is to show the very great disparity of opinion then existing respecting the *Phænix*, much the same as now, unfortunately, appertain to the Moa age.

P.S.—Since closing my paper I have received a copy of the “Report of the Fourth Meeting of the Australasian Association for the Advancement of Science” (just published), and I find in the address of the Rev. Lorrimer Fison, M.A., the president of the anthropological section, such very appropriate statements—the very counterpart of my own thoughts and ideas—that I hesitate not to

834 WC: Clement, *Ep. ad Corinth.*, c. xxv.

copy a portion of them. The president, too, evidently writes as a practical man well acquainted with his subject.

“... In these investigations”—anthropological—“two things mainly are required: first, a patient continuance in the collecting of facts; and secondly, the faculty of seeing in them what is seen by the natives themselves. We must ever remember that our mind-world is very different from theirs.... As to the former of these two requisites, one’s natural tendency, especially in the beginning of the work, is to form a theory as soon as one has got hold of a fact; and as to the latter, we are too apt to look at the facts in savagery from the mental standpoint of the civilised man. Both of these are extremely mischievous. They lead investigators into fatal mistakes, and bring upon them much painful experience, for the pang attending the extraction of an aching double-tooth is sweetest bliss when compared with the tearing up by the roots of a cherished theory. I speak feelingly here, because I can hold myself up as an awful warning against theory-making.”—[An instance given.]—“Even more mischievous is the habit of looking at the facts in savagery from our own standpoint. Some of our modern anthropologists’ books are full of errors arising from this evil habit—errors which are ‘gross and palpable’ to any one who has lived long among savages, and taken the pains to learn to see with their eyes. ‘You can feel the mistakes with a stick,’ said a good Lutheran missionary (one of Mr. Howitt’s correspondents) [513] who had been reading the statements about the Australian blacks in a work which is generally considered to be of great authority, and has passed through many editions. To get

at the real meaning of the facts we must learn to see in them what the savage sees, and in order to do this we must get out of our own mind-world and into his. We must unlearn before we can begin to learn. It is the lack of this which makes the evidence—or, rather, the opinions—of the mere passing traveller so extremely untrustworthy. As long as he confines himself to telling what he has actually seen, his statements, if he be a truthful man, are of value; but as soon as he begins to talk about what is *in* the facts, in nine cases out of ten he is sure to go astray.

“The best way of getting at the meaning of the facts is to go and live with the natives long enough to learn their language, and to thoroughly gain their confidence—say, from ten to twenty years; but, as this is impossible to all but a very few, the next best way is to get information from the men who are living among them.”—(*L.c.*, pp. 150, 151.)

**1894 Notes and Reminiscences of Early
Crossings of the Romantically – situated Lake
Waikaremoana, County of Hawke's Bay, of its
Neighbouring Country, and of its Peculiar
Botany; performed in the Years 1841 and
1843. *Transactions of the New Zealand Institute* 27:
359-382.**

[*Read before the Hawke's Bay Philosophical Institute,
13th August, 1894.*]

Quæ fuit durum pati miminisce dulce est.⁸³⁵

SEN.

—

We have lately heard of a “perilous passage” made across this lake in April last by a party of notables, and of other few modern crossings a short time before by travellers and visitors, as being the first attempts of Europeans to do so! Having, however, crossed it myself on two occasions more than fifty years ago—and that, too, under far more adventurous circumstances, when the place and all the interior country was wholly unknown—I have thought that a descriptive paper recording my journeys would not prove unacceptable to our Society; premising also that nearly the whole of it was written at the time.

[360]

1. MY FIRST VISIT TO LAKE WAIKARE.

835 Those things which were hard to bear, are sweet to remember.—
Seneca, Hercules furens (656).

It was in December, 1841, that I first saw Waikaremoana. I had left the Bay of Islands (my place of residence) on the 19th of November, on board of a small vessel proceeding down the East Coast, which landed me at Wharekahika (Hicks Bay), between Cape Runaway and the East Cape. At this place I had also landed about five years before, on a missionary visit to the Maoris of these parts, so that on this occasion I was not wholly among strangers.

Having stayed a few days in this neighbourhood, and engaged five Maoris as baggage-bearers, I journeyed leisurely down the coast towards Poverty Bay, detecting not a few novelties in entomology, conchology (fossil and modern), and botany. Two common yet striking objects in particular may be mentioned, as such are not found here in Hawke's Bay—the one geological, the other botanical. The rocks in the vicinity of Hicks Bay were chiefly composed of sand and pudding-stone, the latter containing immensely large oyster-shells, some of which were petrified, and contained in their cavities very fine crystals of lime. A walk of a few miles brought me to Te Kawakawa, a village situate on the immediate seashore, under a high and almost perpendicular cliff of white clay. The cliffs here are composed of a bluish indurated clay and conglomerate, and contain marine fossils. On these shores the clayey rocks had been so acted upon by the sea as to be worn quite flat, in many places stretching out into a continuous horizontal layer of rock of nearly a mile in length. On them grew a peculiar kind of large procumbent thin Alga, which, boiled or steamed, is commonly used as an article of food by the Maoris of these parts: they call it parengo, also karengo.

This plant, when dried in the sun, is made up into small lots, and sent to their friends residing in the inland districts, who send the donors potted forest-birds in return. When growing fresh and wet it is exceedingly slippery to walk on. The pohutukawa⁸³⁶ trees here form a thick and evergreen rampart between the sea-beach and the mainland (or bases of the cliffs and hills), the roots and trunks being often laved by the flowing tide. At the north this tree attains to a much larger size. There, too, it invariably inhabits the immediate sea-shore, though generally growing singly, often grotesquely hanging in an almost pendent manner from rocky cliffs and headlands, and always adding largely to the beauty of the scene. Here, in a clayey rock near high-water mark, the natives show the impression of the foot of Rongokako, one of their illustrious progenitors [361] (or mythical prehistoric personages), the print of his other foot, made in striding hence, being near Poverty Bay, a distance of more than fifty miles. Many marvellous exploits are related of this celebrated personage. I did not (as on my former visit) go round the East Cape—a bold and high promontory, composed of indurated clay, reclining back in solemn grandeur; on its face nothing grows, owing to the continual descent of débris from its summit and sides; but, it being nearly high water, we struck inland through a narrow, sandy defile emerging beyond the cape to the sea-beach.

On the evening of the 9th December we reached the high bluff promontory commonly known from its appearance at sea by the not inappropriate, though quite unclassical,

836 WC: *Metrosideros robusta*.

cognomen of Gable-End-Foreland, given it by Cook, and equally well named by the Maoris Pari-nui-o-te-ra (high cliff of the sun). This remarkable headland, of not less than 200 ft. in perpendicular height, is entirely composed of white indurated clay, on whose face and sides grew not so much as a single moss or lichen, from the continual crumbling-down of the clay of which it is composed. Here, in the pelting rain, beneath this towering crag, where we could scarcely stand owing to the extreme slipperyness of the wet clayey rocks and seaweeds, we found that the tide had not sufficiently ebbed to allow of our passing onwards without hazard. As, however, the evening was drawing on, and we had still some distance to travel ere we should meet with either food or shelter, we were necessitated to make the attempt. Scrambling in some places on all-fours like a cat, and upborne in others by my faithful Maoris, I rounded this cape through the breakers, passing under a natural archway in the extreme face of the rocky cliff, and got in safety to the other side. Continuing my march I collected several species of marine Algae that were new to me. At sunset we arrived, wet, cold, and hungry, at Pakarae, a small village containing about twelve persons, who, according to their hospitable custom, heartily welcomed us, although, as we subsequently found, they had not a scrap of food to give us, this season of the year being always the one of scarcity of cultivated vegetable food. The old chief kindly pulled up three stakes from the fence of his little city—for trees there were none in this neighbourhood—as tent-poles for my tent, and presented me with a raw dead crayfish, which I was happy enough to obtain and divide among us—six in all—as a substitute

for supper. The next morning we started early—having procured a basket of kumara (sweet potatoes) for breakfast, which were kindly fetched during the night from some distance—travelling, as yesterday, by the seaside. About 5 p.m. we reached the river at Turanganui, a village in the north-west angle of Poverty Bay, and, crossing [362] it in a canoe, proceeded on to Kaupapa, then the residence of the Rev. W. Williams, subsequently the first Bishop of Waiapu, and arrived there by 7 p.m. quite tired.

At Poverty Bay I remained several days, and during my stay obtained specimens of several new and little-known plants. On the morning of the 20th December I once more recommenced my journey, directing my course for the first time directly into the interior. Proceeding up Turanga Valley by the river's banks, over alluvial and grassy plains, we reached the forests at the base of the first high range of hills by 2 p.m. On my way thither I discovered a few plants that were new to me. Among them were a fine aquatic *Ranunculus*,⁸³⁷ with very long and fistulous petioles, nearly as stout as the barrel of a goose-quill; and, higher up, a handsome plant with copious verticillate inflorescence, large subrotund leaves, and long, stout petioles, but all its flowers had long before withered. Some of its erect flower-stalks were 2 ft. high. I subsequently reared it at the Bay of Islands, where it flowered well. It is the fine *Ourisia macrophylla* of Hooker, also since found by me on the edges of watercourses at Titiokura, and in several other similar spots in Hawke's Bay. From the top of these hills the

837 WC: *R. macropus*, Hook.f.

prospect is most extensive. Beneath me, as a panorama, was Poverty Bay, with its romantic headlands, while far away to the left Hikurangi (the mountain near the East Cape) hid his venerable head in the clouds. Continuing our march till near sunset, we halted for the night by the side of a small stream in a desolate wild called by the Maoris Tapatapauma. The sides of this rivulet were ornamented with fine plants of a species of large-leaved *Fagus*, which I believe to be quite distinct from a closely allied species discovered by me at Whangarei in 1839,⁸³⁸ though both considered as one species (*F. fusca*) by Sir J.D. Hooker.

The next morning I resumed my journey. Gaining the summit of the high hill before me, I had an extensive view of the interior. Hill rose on hill (Pelion on Ossa) in continuous succession as far as the eye could reach. To the left was Whakapunake (the fabled residence of the gigantic moa), an immense table-topped hill, or rather mountain; while to the right, far away in the distance, Panekire, a peculiarly precipitous [363] mountain, cast its bold outline in fine relief into the sky. This, my Maori guide informed me, was Waikare, to which place we

838 WC: "The leaves of the species of *Fagus* detected at Whangarei are ovate-cordate, serrate nearly to base, truncate subtridentate, number of serratures in each leaf 15–21, petioles slightly villous, leaves larger and broader than in the species found at Tapatapauma, which are rhombic-ovate, upper half of leaf serrate or sublaciniate, the apex much more truncate and tridentate, attenuated at base, serratures acuminate or mucronate, 11–13 in each leaf, petioles and whole upper surface of leaf tomentose."—W.C., MSS. ined., "Tasmanian Journal of Natural Science," vol. ii., p. 234.

were going. Time, however, would not permit a lengthened gaze, so, descending the hill, I proceeded on. At Hopekoko, a small stream (where we rested a while to dine on roasted potatoes), the bed at the ford was one flat block of sandstone. Having feasted with most hearty zest on our vegetable roast, and fallen into marching-order, we soon arrived at a small cataract, down which the water fell perpendicularly about 20 ft. into a deep and dark basin. The only ford at this place was on the very narrow edge of the fall (composed of a single mass of rock), over which I was obliged to be carried, not daring to trust myself on that perilous and slippery path, which reminded me of Al Araf, the bridge to the Mahometan Elysium. As it was I very nearly fell, through nervous excitation, into the gloomy depth below. The water, too, above was just as deep, dark, and forbidding, shelving rapidly from the razor-back edge of the rock.⁸³⁹ About sunset we arrived at the banks of the River Whangaāoa (one of the principal branches of the River Wairoa, which disembogues into Hawke's Bay). Here I obtained two small canoes from the Maoris residing here, and paddled down the river about two miles and a half to Te Reinga, the principal village of this district. This river winds round the enormous hill Whakapunake, at the base of

839 WC: Sometimes, in my many travellings, I have been so carried (as a child on its mother's back) over slimy, slippery tree-trunks, denuded, too, of their bark, felled and thrown across chasms and deep rivers, where the banks were densely overgrown with thick and creeping jungle. And once in the interior (on the west base of the Ruahine Range) I was in like manner carried down a very high and precipitous cliff, where there was scarcely anything to hold by, the naked feet of the mountaineer Maoris holding firmly on, like a hand, or a bird's or goat's foot.

which the village is situated. I had often heard from time to time from the Maoris of this place, and of the abyss-like cataract in its immediate vicinity, and had long cherished a hope of one day visiting it. Tired as I now was, I wished for morning, that I might realize my desire, and gain a few more additions to the New Zealand flora. The roar of the waters during the stillness of the night had much that was soothing as well as solemn in the sound. Morning broke, and, prayers and breakfast over, I entered into a little canoe and was paddled about two hundred yards to the great bed of rock which, crossing the river, dams up the water and causes the fall. This cataract, from its situation, is exceedingly romantic, the most so, I think, of any fall I have yet seen in New Zealand. The bed of rock, or rather deposit of indurated clay, sand, and mud of a very white colour, which here obstructs the progress of the river (and [364] through a narrow pass in it the water rushes), is filled with marine shells in a fossil state, although at a great distance from the sea, and at a very great height above its present level. This bed of white rock is large, being not less than 200 ft. in width, and, when the river is swollen by the winter's rains, surrounded as it is by high and densely-wooded hills, the fall must present a very imposing appearance. I gained several specimens of shells—uni- bi- and multi-valve—by digging them out of the rock with my hatchet. Among them were specimens of the genera *Terebratula*,⁸⁴⁰ *Valuta*, *Pecten*, *Lepas*, and others at

840 WC: “*Terebratula tayloriana*, Col. (Fossil).—Shell ovate, ventricose, very solid, smooth, concentrically and obsoletely striated, lamellar; margin apparently entire; summit of larger valve much produced, arcuated, sub-deflexed, thick, very truncate;

present unknown to me. The waters fell from rock to rock three several times ere they were swallowed up in the dark eddying gulf below. The deep gloom of the river in the gorge beneath, the different hues of the dense masses of foliage on either side, the sunbeams peering downwards through the tops of the trees, the enormous bed of rock above—as white as snow, the Maoris who accompanied me perched here and there upon the same, and the little village in the background, combined together to cause an enchanting and indescribable scene, possessing powerful effect. In the height only of the fall was I disappointed. I attempted a hurried sketch, but could not do the scene before me justice; in fact, I had too many things to do at once, consequently I did nothing well. I wished afterwards, when it was too late, that I had remained a day at this place, instead of passing on post-haste in the manner I did; but then I had a long and unknown journey before me, and was also confined to time. Returning to the village, and obtaining, though with great difficulty, guides and baggage-bearers to Waikare, I again resumed my journey. Paddling up another branch of the river named Ruakituri for about a mile, we landed on the left bank. The sun, almost vertical, was intensely powerful—not a zephyr playing nor a cloud in the air, nor a tree or bush which could afford a shade anywhere at hand. Through unfrequented paths (if paths such could be termed), up and down steep hills overgrown with tall

perforation large; horn or light mouse coloured; length, $2\frac{1}{4}$ in.; breadth, $1\frac{1}{2}$ in. *Hab.* As above. *Obs.* This fine species has been named after the Rev. R. Taylor, of Waimate, New Zealand."—“Tasmanian Journal of Natural Science,” vol. ii., p. 244.

young fern,⁸⁴¹ which at this season is particularly disagreeable from the clouds of fine yellow vegetable dust (deciduous scales and hairs) with which it is loaded, and which, inhaled at every breath, causes you incessantly to sneeze, we travelled until [365] 3 p.m., many times halting by the way. Having roasted a few potatoes, on which we dined, I endeavoured to cheer my companions in travel, but to little purpose.⁸⁴²

Recommencing, however, our journey, we continued our march, through want of water, until long after sunset. Fortunately, I succeeded in finding some, by the side of which, in the open wilderness, we bivouacked, all too fatigued to care much about anything save rest. Gained nothing new in botany in the whole of this melting day's horrid march—fern, fern, nothing but dry, dusty fern all around. A river, the bed of which we descended into and crossed, ran at the depth of from 30 ft. to 80 ft. below the surface of the soil on either side; a coarse slate and thinly-stratified sandstone formed its bed.

The next morning, at a very early hour, we arose, and, with stiff and unwilling limbs, proceeded onwards. Want of food in great measure impelled us forward, as we had yesterday been led to suppose that we should reach the next village by night. After three long hours spent in

841 WC: *Pteris esculenta*.

842 WC: Here I may mention what I have not unfrequently noticed—the great difference between Maoris from the coast and those of the interior when travelling together in the hilly forests; and this also obtains (*vice versa*) when the inland mountaineer Maoris have to travel over long, flat, sandy beaches. In the olden time no Maori ever went far from his home, save on special occasions, and then in a body.

active exertion we reached Whataroa, a small village, where we were heartily welcomed. Having breakfasted and rested awhile, we left this place, and continued our march, which, as yesterday, lay over high hills, which rose in perpetual succession before us—appearing as if they were without valleys between. The country, as we progressed into the interior, became more and more barren. A scanty vegetation of stunted *Pteris esculenta*, *Leptospermum scoparium*, *Leucopogon fraseri*, and such plants, alone existed on these dry and sterile spots, save where, in the deep precipitous glens between the hills, a clump of wood was to be found, showing their heads of foliage here and there above the level of the flat lands around like oases in the desert. The soil was dry and dusty, and principally composed of broken pumice. Towards evening, from the crest of one very high hill, I had, in looking back, a splendid though distant prospect of Hawke's Bay, and the high and rugged land bounding the same. My native guides assured me that no person could keep his footing on this elevated spot when the south wind blows—an assertion which the denuded and bare aspect of the place, together with the very stunted and gnarled appearance of the few trees and shrubs about it, seemed fully to corroborate. Bivouacked again for the night at Whakamarino, a little village on the banks of a small river. [366]

Early the next morning I recommenced my march towards Waikare Lake, the old chief of Whakamarino accompanying me. An hour's walking brought me to Waikare-taheke, a rapid stream of about 4 ft. deep, caused by the exit of the waters of the lake towards the sea, which here most outrageously tumbled over a long

and sloping bed of rock. A bridge of trees (and one of the best-constructed native bridges I have ever seen) was thrown across the foaming torrent, which, though strongly secured together with the woody stems of tough climbing-plants and supplejacks from the forest, seemed as if every rush of the bounding water would carry it away. A nervous person would scarcely have hazarded himself on such a vibrating and precarious footing. The singular beauty of the spot riveted my attention for a few minutes, and I had almost determined to venture on a sketch. Passing on, we soon arrived at the village Te Onepoto, situated on a high headland jutting into the north side of the lake. The gateway was, as is often the case, embellished with a pair of huge and boldly-carved human figures, besmeared with shining red pigment, armed with spears, and grinning defiance to all comers. These were not only seen to advantage through being elevated above the horizon, but their eyes (or rather sockets), instead of being set with glittering *Haliotis* shell (according to the usual national custom), were left open, so that the light of the sky streamed through them, and this was yet more particularly manifested owing to the proper inclination given to the figures, looking down, as it were, on all toiling up the narrow steep ascent into the well-fenced village. The wind now blew so very strongly that it was not possible to cross the lake in such small and frail canoes as this people had at command, so I was obliged to halt and pitch my tent here, although it was not an easy matter to find a spot suitable, owing to the very great unevenness of the ground, its unsheltered situation, and the very high wind. It was now Christmas Eve, and

here I was confined a prisoner until the 29th, spending a very unpleasant Christmas.

Whilst detained, however, I made the most of my time, and was amply rewarded with specimens of new plants, and among them were several ferns. Had I not been very anxious to prosecute my journey I might have spent a very agreeable time at this romantic and interesting place. Such, however, was not the case; the people among whom we now were had scarcely at this season any food for their own use, and, although they exerted themselves to the utmost in their endeavours to be hospitable towards me and my party, they could only allow us two scanty meals of roots and herbs *per diem*.

Although at this season harvest was about commencing in the more northerly parts of the Island, here, in those elevated [367] spots, it was so cold that I was often obliged to keep on my thick cloak, or walk briskly about to keep myself warm. The natives assured me that the snow lay many feet deep on these hills in the winter, and that at such seasons they kept within their houses. Their houses are large and warm, and curiously constructed to keep out the severity of the winter's cold, each being built over a large pit or trench the full size of the house. Thus a house that on the outside appears to be only 3 ft. or 4 ft. high is, when you descend into it, from 5 ft. to 7 ft. in height.

I obtained from the lake some fine specimens of *Unio*,⁸⁴³ the only living thing, according to the natives, found

843 WC: “*Unio waikarensis*, Col.—Shell oblong or oblong-ovate, concentrically and irregularly sulcated, subdiaphanous, inflated; anterior side produced, obtuse, slightly compressed; posterior

within its waters. I supposed this sheet of water to be about six miles in diameter, but could only guess as to its probable size from its very irregular shape. The lake is very deep and clear, and the bottom rocky. During my stay I was often struck with the magnificence of the waves of the lake; these seemed to me to be altogether unlike in grandeur and high broken commotion to anything I had ever observed in those of the sea or ocean. Perhaps such was owing to the difference between the specific gravity of salt and of fresh water, as well as to the terrific roaring blasts that furiously rushed down the narrow mountain-gullies. The continual noise by day and night caused by the winds and the waves dashing against the high, rocky romantically-piled crags was deafening; all speech was with difficulty heard.

A peculiar sea-bird, called by the natives "tiitii," which often flies irregularly at night, making a noise resembling "tee-tee-tee-tee," rapidly uttered (whence its name), is sometimes taken in this neighbourhood in large numbers. From the natives' account, it should appear that these birds resort at certain times to the tops of the highest and barrenest hills, where the natives assemble and make fires on foggy calm nights, which fires decoying the birds thither, they are easily taken with nets. I have often heard the bird when flying at night, but have never seen one. It

slope keeled, sharp; base slightly depressed; umbones decorticated, flattish, much worn; primary teeth large, crested; epidermis strong, overlapping at margins, wrinkled on anterior slope; colour brownish - yellow on posterior side, shading into dusky-green on anterior, with alternate light-coloured lateral stripes; $3\frac{1}{2}$ in. broad, $2\frac{1}{4}$ in. long. *Hab.* Waikare Lake, &c."— "Tasmanian Journal of Natural Science," vol. ii., p. 250.

is, I think, highly probable that they may belong to the genus *Procellaria*—perhaps it is the species *P. cookii*.

Having been daily—almost hourly—on the watch for the [368] wind to lessen, I had got together several small canoes, with their paddlers and balers, to take me and my party across; the largest ones would just carry four persons, two to paddle if calm, but only one to paddle and one to bale if breezy. The others only carried three; so that with our baggage it was really a difficult matter safely to arrange the little flotilla. Early on the morning of the 29th, the wind lessening, we hazarded a passage, and crossed in safety to the opposite side. I, in the biggest canoe, with two natives to paddle and one to bale, was obliged to kneel or squat in the centre of the canoe, and of course in water, which came constantly into the frail bark, with my hands one on each gunwale and in the water of the lake during the whole passage. The “ever-changing” woodland scenery appeared most lovely, as we, in our tiny canoes, wound round the bases of these everlasting hills. Wherever we could we kept close to them, so as to have them to swim to if upset. Here for the first time, far away from the immediate sea-coast, I noticed the littoral species of *Metrosideros*,⁸⁴⁴ pohutukawa of the natives. It grew also in similar rocky situations close to the water’s edge, and after the same irregular and diffuse manner. Parasitical on its branches, in great abundance, flourished a fine *Loranthus*,⁸⁴⁵ gorgeously displaying its profusion of scarlet blossoms. I could not pass by this without securing some, although

844 WC: *M. tomentosa*, A. Cunn.

845 WC: *L. colensoi*, Hook. fil.

my three canoe-men were very averse to their stopping and to my landing for such a purpose. We ran our canoes on shore on a little beach at the margin of the forest, where the trees overhung the water; and soon a lot of natives who lived near by came about us, and at their pressing request I consented to spend the remainder of that day and night with them. At intervals during the day I obtained several botanical prizes and novelties, among them some *Hymenophyllæ*, which here, in these ever-humid umbrageous undisturbed solitudes, flourished in full beauty, and with them some fine specimens of that handsome tree *Ixerba brexioides*, A. Cunn., which, rare at the north (where he originally detected it), was here the common tree of these forests, and at this season abounding in flowers: indeed, from its noble appearance, with much larger leaves, I at first supposed it would prove to be a second species.

The next morning (30th) I resumed my journey, after experiencing no little difficulty in obtaining a guide over the mountains, in which service I had to enlist all my suasive powers. This point settled, we commenced ascending from the shores of the lake, passing through dense forests, chiefly composed of fine trees of *Podocarpus*, *Fagus*, and *Ixerba*. [369]

Having gained the summit of the range we found travelling easy, for in these forests, where the broad-leaved *Fagus* is the principal tree, there is but little underwood; indeed, plants generally seem as if they disliked the shade of these trees, probably, however, owing to the falling of its rather thick and dry leaves, that do not soon decay. In these woods I first found a peculiar

little hexandrous plant, which proved to be a species of a very small and curious South American genus—*Callixene*⁸⁴⁶—and with it a new terrestrial *Orchis*,⁸⁴⁷ a pretty little plant with a single leaf bearing a long one-flowered scape. The natives had told us before we started that we might expect rain on these mountains (they having a proverb to the effect that it is never dry in these parts); and so, indeed, it came to pass. After we had proceeded for about two hours it began to pour down in torrents; no shelter being at hand, we were obliged to continue our march in the cold and pelting rain. I much regretted the state of the weather, as I had every reason to expect many new and rare plants in these elevated regions. The family of ferns presented the most lovely spectacle this day I ever witnessed. In these deeply-shaded ever-humid recesses my enchanting *Todea superba* and *Lomaria rotundifolia*⁸⁴⁸ flourished in perfection, the densely-covered and dark-green fronds of the former contrasting so beautifully with the light-coloured, elegant, and membranaceous ones of the latter. The fronds of these ferns were grouped in ever-living circles of green, from 5 ft. to 6 ft. in diameter, many single fronds of either plant measuring upwards of 3 ft. in length. Another new species of *Lomaria*⁸⁴⁹ I also found growing in these spots. Notwithstanding the warning of

846 WC: *C. parviflora*, Hook.

847 WC: *Adenochilus gracilis*, Hook.f.

848 WC: Now *Lomaria fluviatilis*, Spreng.

849 WC: *L. latifolia*, mihi, described, with others, in "Tasmanian Journal of Natural Science," vol. ii., p. 175, but placed by Hook.f. as a var. of *L. procera*, in which, however, I cannot agree.

the elements, I gazed entranced upon these beautiful productions of nature, and wished much to secure good specimens. I was obliged, however, under existing circumstances, to content myself with a couple of specimens of each new species, and these, too, hastily gathered and put up dripping wet into the bosom of my wet cloak, to the very great astonishment of my native companions. A beautiful and delicate large white lichen here grew on the trees, causing, in some situations, a very striking effect. The densely-wooded mountains over which I this day passed were chiefly composed of sandstone, which showed itself in different stages of decomposition in the very numerous slips in their sides. In descending one of those recent gorges [370]—which required in some places no little caution—one of my natives who carried the box containing books, testaments, &c., slipped his foot and went sliding away, until he was stayed by a friendly tree—fortunately without receiving any injury to himself; the box, however, though dovetailed at its angles, was knocked to pieces with the violence of the concussion. After a silent and persevering march of some hours through the very cold rain (for, in threading our tortuous way through the endless mazes of a trackless forest, in such weather as we now experienced we found it impossible to keep ourselves warm) we began to shiver with cold, and determined to halt and make a fire at the first sheltered spot. By the side of a rivulet at the bottom of a hill we found a deserted hovel, which, though open on all sides, offered us better shelter from the pitiless rain than we had expected to find in such a place. We hastily and roughly repaired our hut with tufts of the different big sedgy plants that grew hard

by, and pitched my tent; and, throwing off our dripping garments and kindling a fire, we endeavoured to make ourselves as comfortable as we could in our present circumstances. Fortunately we had a few potatoes with us, which, not knowing how long this weather might continue, we divided, *unâ voce*, into three small portions, so as to afford us two meals for the morrow. The rain continuing to descend in torrents swelled our little friendly rivulet into a large stream, causing me to fear that the limited level spot on its bank on which we were now encamped would be overflowed.

Daylight the next morning (31st) found us much the same as daylight last evening left us—with water on every side. The past night was one not likely to be soon forgotten. The heavy rain and rattling hail which unceasingly poured down; the vivid lightning and hollow-sounding thunder reverberating awfully in never-ending echoes among the hills; the angry winds that furiously rushed in fitful roaring blasts through the ancient forests, rocking and creaking, and, lashing the monarchs of centuries as so many saplings of a year, stripping their “leafy honours” and cracking off their branches, hurled them to the earth; the hooting of owls and shrieking of parrots, which flew affrightedly about, seeking shelter—all united to declare, in a voice too plain to be misunderstood, the great commotion nature was undergoing—fit knell for the departing year!

The morning was most gloomy; the rain still incessantly poured, and our cold, wet, lonely, and starving situation was anything but pleasant; when, as if we wanted something more to taste of the very acme of

cheerlessness, our only guide deserted us, returning to Waikare. He had intimated enough last evening to cause me to suspect him, and I had [371] kept a watch over him, but he easily found an opportunity of leaving us. My other natives were all from distant parts of the Island, and knew no more of this neighbourhood than myself. We were now in a dilemma; to go back to Waikare was, from there being no proper path or track, not a whit easier journey than to go forward to the next village—wherever that might be. The weather, however, confined us to our rude shelter, under which I, clad in light summer clothing, shiveringly sat, holding an old, worn umbrella over my head. Towards evening the weather moderated, and I ventured to walk a few yards among the half-drowned vegetation on the banks of the river. At night, rain still pouring down, I called the natives to council to consider what we had better do in this our exigency, so we unanimously agreed, “rain or shine,” to proceed on our journey tomorrow morning, travelling by compass, and trusting, somehow or other, to find our way to some village—a determination to which we were compelled through hunger, having consumed our last scanty meal.

1842, 1st January.—Early this morning the rain ceased; but, as the heavy clouds still shrouded the face of heaven, it was just as wet from the dripping trees and rank vegetation around us in these deep valleys and dark forests as if it were still raining. We commenced our wet and cold march *sans* breakfast with perhaps a more hearty will than if we had fared sumptuously. We kept by the banks of the little stream, which we crossed and recrossed repeatedly, making our walk very unpleasant; but no one expressed a murmur. Here in these deep

secluded glens I detected a few ferns that were new to me. About noon, to our very great surprise, our runaway guide overtook us, bearing a large basket of fine potatoes on his shoulders, for which he had purposely gone back all the way to Waikare in that heavy rain, "in order that we might not die from hunger." I could not but esteem and applaud the man's kind consideration and heavy toil and labour for a party of strangers, whilst I disapproved of his leaving us in the manner he did, without saying a word as to the object of his returning to Waikare. With a hearty goodwill we—all hands—turned to kindle a fire and roast potatoes. And resuming our march, our guide now going with us, we arrived in the afternoon at Ruatahuna, a small village, surrounded on all sides by the eternal forests, where we were most hospitably received. Several of the natives of this village were engaged in making and carving poukakas—*i.e.*, parrotstands—but only used in snaring the large brown New Zealand parrot (*kaakaa*) of the natives, which is commonly eaten, though its flesh is dry and lean. Their red feathers (a few found under and about its wings and neck) are in great request [372] for ornamenting their chiefs' carved-headed staffs, which are also used as weapons of defence. They are also fond of taming these birds as pets and decoys, which if taken young will soon talk; but they are very mischievous, and their bite is severe. That little black pest the sandfly was here in countless swarms, owing, I suppose, to the sandy nature of the soil. I never before noticed them in such numbers at any place away from the immediate sea-coast, to the sandy shores of which they are generally confined. Their bite is most

virulent just before and after rain. The natives call them *namu*.

At this village I remained several days, busily engaged with the natives, many of whom were astonished at seeing a white man. On resuming my journey, our route at first lay over high steep hills, clothed with forests to their summits, thence descending to a deep valley, where ran a rapid brawling stream of from 2 ft. to 3 ft. in depth. By the immediate flat banks of this river, among gigantic herbaceous ferns and underwood, decaying logs, and fallen trees (which latter seemed as if in times of severe floods to have been brought hither and stranded, and proved serious impedimenta to our progress, often causing painful wounds and bruises, from their not being seen), we travelled on, every now and then crossing the stream, which we certainly did more than fifty times. This was by no means pleasant travelling; but there was no alternative. It was here on these alluvial flats I first saw a large and peculiar species of *Lomaria* growing extensively and closely, and hiding the decaying logs and sticks.⁸⁵⁰ On the [373] banks of this river I also obtained

850 WC: This large, striking, and strange-looking fern was early described by me (with others, in the "Tasmanian Journal of Natural Science," vol. ii., p. 175, 1843) as *L. heterophylla*, from the curious abnormal forms of its ever-varying fronds or leaves; subsequently by Sir W.J. Hooker, in his "Icones Plantarum," vol. vii., tab. 627, 628, from specimens secured on this occasion, as *L. colensoi* (there being already a species of *Lomaria* named *heterophylla*, of which I, here at the antipodes, was ignorant). This name has again been altered by Sir J.D. Hooker, in his N.Z. Flora, to *L. elongata*, Blume; and since then it has been further referred to *L. patersoni*, Spreng., by Baker (including also *L. cumingiana*, Hook., and *L. punctata*, Blume) in his "Synopsis Filicum." This

specimens of a fine arborescent fern, *Dicksonia fibrosa*, Col., which attains the height of 18 ft.: its caudex is very bulky, and is composed of thick layers of fibres, resembling at first sight the fibrous interior of the husk of a cocoanut. The trunks of the larger ones were grotesquely hewn by the natives into all manner of uncommon shapes, in their cutting away their fibrous outside for the purposes of planks for their houses and stores, it being more easily worked than wood, and forming a better defence against rats. In this locality I also found a species of *Myrtus*,⁸⁵¹ a small slender tree bearing orange-coloured juicy berries, growing to the height of 10 ft.–15 ft. The natives spread their broad dress mats on the ground under these trees, and, shaking them, soon procure a quantity of fruit, which is very good eating; they call the tree rohutu; each berry generally contains three hard reniform seeds. Towards evening we

last is an Indian fern, and is well drawn, with dissections and full descriptions, by Beddome in his "Ferns of Southern India," tab. xxviii. and xxviiiA. I still, however, think our New Zealand fern to be distinct from *L. patersonii*. While plentiful in its proper inland home, it is very scarce in Hawke's Bay District. I only know of it growing in one small limited spot on the side of a hill streamlet in the Seventy-mile Bush, near Dannevirke, and rediscovered there by me in 1888, after a lapse of more than forty years, when I hailed it as an old acquaintance. The Maori name of this peculiar fern is also worthy of notice, as showing (what I have more than once called your attention to in my papers) their correct natural mode of naming plants and other things—*pakauroharoha*—literally, slightly-outstretched wing, from its broad and lax pinnatifid segments; adopted from the term given to the attitude of a shag when drying its wet wings on a tidal bank.

851 WC: *M. pedunculata*, Hook.f.

emerged from the dense forests in which we had for some days been confined and toiling, to a large plain covered with the common fern, the first fern we have seen for several days. My natives rejoiced at the sight, vociferating loudly their being privileged to see a "koraha maori" (indigenous fernland, open country) again. Their uncontrolled joy forcibly reminded me of the rejoicing of the "ten thousand" Greeks on their again seeing the sea. We halted this evening at Te Waiiti, a fenced village situated on the banks of the river at the end of the plain. This stream is here large enough to float a moderate-sized boat; its bed is composed of ashes and other volcanic substances worn into rounded pebbles, which, though originally very light, were now saturated with water, and heavy.

The next morning we resumed our journey. Passing through a low wood we toiled up the barren, steep, and lofty hills before us. These hills are composed of broken pumice and ashes. The sun was intensely hot, and the pathways or tracks, in several places worn into deep and hollow ruts, were extremely dry and dusty, our feet, and even our ankles, being often buried in the loose and broken pumice through which we had to travel, rendering it very unpleasant, and even painful to my native companions with their naked feet. Gaining the summit of the highest hill, the view was most extensive and striking. Immediately beneath meandered the River Whirinaki, a bold brawling stream flowing quickly over its stony bed, and possessing water sufficient to float a moderate-sized boat. Beyond arose barren hills of all possible irregular shapes and heights; further still an extensive plain extended east and west as far as the eye could reach;

beyond it a chain [374] of lofty table-topped hills bounded the range of vision; while here and there, far away in the extreme distance, several high and isolated mountains reared their barren heads above the horizon. On the left appeared Tauwhara, a high mountain in the Taupo district; Paeroa, and Kaingaroa, near Rotorua, presented themselves in front; while on the extreme right Putauaki, the high mountain near Whakatane on the east coast, upreared its two-peaked summit to the clouds. Here, notwithstanding the pleasurable height to which my imagination had been raised whilst engaged in contemplating the magnificence and extent of the prospect before me, it soon sank below its ordinary level on finding that not a human being dwelt in all that immense tract of country on which my eager gaze then rested. The grass grew, the flowers blossomed, and the river rolled, but not for man. Solitude all! Even the very little birds, denizens of wilds, few though they were in number, seemed (so fancy intimated) to think with me, for they flew from bush to bush around and about my path with their melancholy "twit, twit," as if wishing to have all they possibly could of the company of a passer-by. Their actions were quite in unison with my thoughts, and I feelingly exclaimed,—

"Oh! Solitude, where are the charms," &c.

Descending to the banks of the river Whirinaki, I was rewarded with the discovery of a few new plants. Crossing the stream, and by-and-by proceeding over the long plain I had seen from the top of the hill, I obtained a few more botanical novelties, of such kinds as made up the vegetation of this very desolate and sterile spot. I

think I never before saw so barren, a plain as this. A truly “blasted heath”; or, in the nervous language of Holy Writ, a “parched place in the wilderness; a salt land, and not inhabited.” Night was now fast closing around us, so we quickened our pace, although excessively tired, in hopes of finding a few sticks wherewith to kindle a fire, for none at present appeared within ken. After some time we found some small dry scrub—manuka⁸⁵²—on the immediate bank of the river Rangitaiki, where we bivouacked for the night.

At a very early hour the next morning we recommenced our journey. Crossing the rapid river Rangitaiki, which at the fording-place we found to be breast-deep, and which we were obliged to cross in an oblique direction, holding firmly on to the tent-poles, that we might not be swept down by its strong current, we travelled over a country more sterile, if possible, than that of yesterday. An interminable succession [375] of dry and barren hills of broken lava, pumice, ashes, and other volcanic matter, where the stunted vegetation was all but quite burnt up with the exceeding heat of the sun’s rays (it being now midsummer), afforded but a very scanty gleaning to the botanist. I was, however, rewarded with a few new plants (their finding served richly to beguile the tedium of this day’s journey). Among them were a graceful species of fragrant-scented *Dracophyllum*,⁸⁵³ a small shrub 2 ft.—4 ft. in height, which grew sparingly in the little dells between the hills; and two curious and minute species of *Compositæ*, which formed dense moss-like patches on

852 WC: *Leptospermum scoparium*.

853 WC: *D. subulatum*, Hook.

the lumps of dry broken pumice. These interesting little plants were scarcely above 1 in. in height, presenting quite a unique appearance with their brown and hoary leaves closely imbricated and decussated, and terminal heads of yellow silky flowers. Here, in these sultry hollows, the insect tribes were very numerous. Brilliant *Libellulæ* darted about in every direction. I captured one fine fellow, a species of *Petalura*, dappled with burnished gold, measuring nearly 4 in. in length; others, having filiform attenuated bodies,⁸⁵⁴ were carmine-coloured, with elegantly-disposed lozenge-shaped golden spots; whilst others were adorned with alternate stripes of black and ultramarine. Of the beautiful genus *Buprestis* (or some very nearly allied genus) I gained several specimens. Some of them were abundant on the fragrant *Dracophyllum*, allured, doubtless, by its scent and honey. The moment, however, you attempted to take one, down to the ground it would let itself drop, as if dead. The greater number of the insects I obtained were quite new, and of genera unknown to me.

Towards evening we arrived in the neighbourhood of the Rotorua lakes. Crossing a deep bog, I discovered a peculiar little leafless monopetalous plant⁸⁵⁵ growing in, or rather *on*, the surface of the mud. On nearing Rangiwakaaitu, the first and southernmost lake, I was much gratified with the truly lovely appearance of a very beautiful species of *Leptospermum*—a, small tree of from 15 ft. to 25 ft. in height—which flourished here, growing in clumps and rows as if artificially planted. These trees

854 WC: *Agrion* sps.

855 WC: *Utricularia protrusa*, Hook.

were literally laden with a profusion of handsome blossom, and (from there being no underwood about them, not so much as a tuft of grass) looked conspicuously charming. Another circumstance appeared to me as being singular: all were old trees of many years' growth, there not being any small or young plants of the species to be met with. I say *old* because the *Leptospermum* is a slow-growing plant. [376] Beneath them grew plentifully a curious woolly-looking white moss, which, though I sought assiduously, I could not detect bearing any fructification. We had previously arranged to make Tarawera (the second lake, where some natives reside) our halting-place for this night; but, although we had nothing to eat, we were so excessively tired as to be obliged to bring up on the white-gravelled shores of the placid Rangiwahakaaitu. I offered my natives the choice of staying supperless where we were or proceeding on to Tarawera, distant about three miles, and there getting supper. Fatigue, however, overcame hunger even in a New Zealander, and they chose the former. The whole face of the country in this neighbourhood was overspread with massy blocks of compact lava scattered in every direction, many of them being vitrified on their surfaces. The ground gently rose on every side from the lake, which appeared to occupy a deep hollow, and I could but venture to suppose that this might have been the crater of that volcano which, in some bygone age, inundated the whole of the adjacent country with showers of pumice and ashes.

At an early hour the next morning we arose, feverish, stiff, sore, and hungry, to recommence our march. We soon, came within sight of the place where the hot

springs were situated, from which the steam and sulphurous vapours ascended in dense white clouds. The air this morning was cool and bracing, and after travelling about an hour and a half we arrived at Tarawera Lake. Here, at a little village on its banks, we gained some potatoes, on which we breakfasted with hearty zest. At this place were several small hot springs which flowed out of the earth near the margin of the lake; the water of some was hotter than the hand could bear. Just within the lake the water was warm; a little further on it was lukewarm; and further still it was cold: so that these natives have baths of every requisite degree of heat always ready at hand, without any trouble whatever. The water of the lake I supposed to be specifically heavier than the sulphurous hot waters which flowed into it, as whenever any of the natives of the village wished to drink I observed them go out into the lake, where the water was kuee-deep, and, dashing the uppermost water aside with their feet, quickly take up some from beneath, or, lowering down a calabash, keeping their fingers closed over the small hole near the handle, fill it below. This water they said was good and cold. The natives of the village informed me that at a spring on a hill at a little distance the water was quite hot enough for the purposes of cooking, for which they often used it. Sulphur, too, abounded there, and was often "thrown up" out of the earth, from which place steam and smoke ever ascended. My curiosity being [377] excited, I, while breakfast was getting ready, set off, with a native of the village as a guide, to the boiling spring; but, after going up one steep hill and down another, and not perceiving any sign of the same, and being almost exhausted from want of food, and

the sun's rays this still morning being very powerful, hunger conquered curiosity and I returned to the village. I have often been surprised at the great carelessness which I have shown towards rare natural productions when either over-fatigued or ravenously hungry: at such times, botanical, geological, and other specimens—which I had eagerly and with much pleasure collected, and carefully carried for many a weary mile—have become quite a burden, and have been one by one abandoned, to be, however, invariably regretted afterwards. Breakfast ended, we, accompanied by the chief of the village, paddled nearly to the opposite end of the lake. This sheet of water appeared to me to be about three miles and a half in length, and from one to two miles in breadth; it is surrounded on all sides by barren hills, and is very deep. Landing, and walking about two furlongs, we came to Kareha, another little lake, much smaller than the preceding. Here we were obliged to sit and wait some time before we could get a canoe, which having obtained we paddled to the opposite end. This little lake is about a mile in length, and about three-quarters of a mile in breadth. Resuming our journey, and gaining the summit of a high hill, we had a fine prospect of the principal Lake of Rotorua—a fine sheet of water, about six miles in diameter, with a very picturesque island nearly in the midst. An easy journey of a few miles from the top of the hill brought us to Te Ngae—a Church mission-station on the eastern side of the lake, where we were very hospitably received by Mr. Chapman, the resident missionary. I gained not a single botanical specimen throughout the whole of this day.

Having thus briefly narrated my return journey as far as Rotorua, I end my relation there, merely adding that I continued it on foot, and, crossing more than once from the east coast to the west coast arrived safely at the Bay of Islands on the 22nd February, 1842.

II. MY SECOND EARLY VISIT TO WAIKARE LAKE.

On this occasion I had travelled up the east coast from Rangiwhakaoma (Castle Point) in company with Archdeacon William Williams (afterwards the first Bishop of Waiapu) to Ta Wairoa, in Hawke's Bay. At Te Wairoa we parted company the Archdeacon going on to his residence in Poverty Bay, and I going directly inland, to carry out the instructions of the Bishop of New Zealand, (Dr. Selwyn), viz.: to take the [378] number and names of all the tribes, sub-tribes, and people—men, women, and children—inhabiting the unknown interior, and for this purpose, if required, to visit every village.

On Monday, the 18th December, 1843, having obtained a native guide to Waikare Lake, I left the village—Uruhou, on the River Wairoa—with my party of young natives (single men), whom I had secured at Te Awapuni (Ahuriri), to accompany me overland to the Bay of Islands.

Our course lay up the valley in a N.N.W. direction. The huge table-topped hill Whakapunake bore N.N.E. from us, distant about twenty miles. After travelling six or seven miles, during which we crossed the River Wairoa in a canoe, we arrived at the junction of the River Wairau, and bore away on its left bank for about a mile,

when we crossed it in a canoe at a little village called Hinemoka, the inhabitants being ten in number. Here we dined, proceeding on west by the right bank of the river for two miles, then north-west to a small village called Iringataha, possessing one good large house; thence two miles to Kainganui, a high hill, from the top of which Panekire (the precipitous and bold high cliff overhanging Waikare Lake) bore W.N.W., Uruhou southeast, and Whakapunake north-east. Two miles further on we passed through a small village called Herepunga, to which place the chief of Iringataha accompanied me. Proceeding hence we travelled on smartly until 8 p.m., when we brought up for the night in an old deserted plantation, where we gained, by digging, a few potatoes for supper.

The next morning we did not rise early, the rain and the mosquitoes having kept us awake during the night. However, we started at 7, and at 9 reached Te Matai, a small clean village on the immediate bank of the stream Waikaretahēke, which we crossed in a canoe, and which, from the great rapidity of its current, was not a little dangerous. At this village I found about twenty-five persons, some of them from the lake. At 11 a.m. we left Te Matai, and halted at 4 p.m. to dine on the grassy banks of the Mangamauka, a small rivulet. From this place we travelled on till sunset, when we brought up for the night in a potato-plantation about three miles from Waikare, where we found a few natives. Our course this day was by the side of the River Waikaretahēke, which is little else than a continuation of rapids, from the great inclination seaward of the whole locality, and well deserves its name. Noticed several pretty waterfalls,

some of great height, the water, however, scanty, often silently flowing down the bare face of an almost perpendicular cliff like a silver thread into the dark-green depths of the forest at its base. We did little more than a half-day's journey this day, owing to the disinclination of my [379] newly-engaged native companions to travel and the great loquacity of my guide.

The next morning, breakfast over, we set forward, two chiefs of the place going with us. Just beneath the plantation we had to cross the outrageous river, and that over a dangerous and wide rapid: the worst part of it had two trees felled and thrown on it; myself and dog had some difficulty in getting across, but eventually did so in safety. The tumbling water was very noisy, and the scene quite romantic. From this place to the lake was nearly all ascent. In about two hours we arrived there, and found the waters like a raging sea. The wind was strong from the north-west, and the noise of the tall trees in commotion and waves and water surging against the rocks was almost deafening: it was with great difficulty one could hear his own voice. Here, at Te Onepoto, a small fenced village on this immediate shore of the lake, were about forty natives: most of them, however, were from Wairau, on the opposite shore; they welcomed us heartily in their usual boisterous hospitable way.

The next morning the wind, which had been blowing furiously all night, was as strong as ever; no crossing the lake while this continues.

Friday, 22nd.—Wind still very high. A very heavy storm of hail fell to-day, which made it very cold, the hail lying on the ground for some time, giving the place the

appearance of snow. A canoe came across the lake to-day before the wind (the largest I had ever seen here) to fetch potatoes. Towards evening I proposed starting, but the natives of the place were not willing to go until tomorrow. When here last, at Christmas, 1841, I was detained six days through the high winds, and I fear this will also be the case this time.

23rd.—Rose early. Found the lake a perfect calm. The natives, however, procrastinated as usual, and went at 8 a.m. to a village about a mile distant to have a *tangi* (cry over the dead) for a child lately deceased. By 10 a.m. they returned, but the wind had again begun to rise. However, I struck my tent and packed up, but by the time they had cooked food and fetched potatoes in flax baskets from their storehouses the wind had risen considerably, and the lake was quite rough. They had about forty baskets of potatoes, besides pigs, &c., as cargo, and were above twelve in number, so they well filled their canoe; and we, being eight persons, with our baggage and my dog, could not possibly enter to cross with any prospect of safety as the lake then was so I was obliged to lose this opportunity. I sent two natives of the place with them to bring back the canoe. They were a long time in crossing; and by evening the canoe returned to us, but with great difficulty. The wind being again too strong to venture on the [380] lake, I was obliged to repitch my tent, and patiently wait for a calm. During the absence of the canoe I ascended Panekire, the high, precipitous hill which arises abruptly, from the south-east side of the lake, and is conspicuous at a great distance. The prospect from the summit was extensive towards the East Coast, the Wairoa River and Hawke's Bay being quite open to view. I was

disappointed in not gaining a single botanical novelty, save a small orchid of the genus *Microtis*.

24th (Sunday).—Wind very strong, and the combination of noises—from winds and trees, waters and rocks—so great and incessant that at divine services my voice was scarcely heard.

25th (Christmas Day).—Wind as strong as ever; the weather, too, gloomy, dark, and lowering. A most disagreeable day, from the thick clouds of fine dust continually blown about, of so exceedingly minute a nature as to penetrate the linen cloth of my tent. It is a curious fact that this same day two years ago I was a prisoner here from the same cause—high winds.

26th.—Wind still strong; could not venture into the neighbouring forests, fearing fallen trees and branches. Sat with three old natives in their subterranean dwelling, and conversed with them. I found that at no great period of time back two canoes at two different times had been upset on the lake, one containing six and the other eight persons, when all perished; only the body of one was found, and that was caused through the presence of mind of the unfortunate dying native, who had fastened himself to the rope of the sail.

27th.—Early this morning the wind had somewhat abated. It soon, however, recommenced blowing strongly, but only in gusts; however, I determined on starting without waiting for breakfast. I had twelve stout paddlers and the largest canoe, so we left at 7.30 a.m. It was a time of alternate hope and fear; every wave that rolled past swept partially over the gunwales of our frail bark, insomuch that one of my paddlers was obliged to be

continually baling; I, of course, in water, and having much trouble with my dog, who did not like his situation at all.⁸⁵⁶ At the end of two hours, by dint of constant hard paddling, we landed safely at Mokau, a small village on the opposite side of the lake. Here Tuiranga, the [381] principal chief of the Urewera Tribe, resides—a venerable old man, with a flowing grey beard, who received us very kindly. He had killed a pig for us, and had been looking out big with expectation for some days, in hopes of the wind abating. Desirous though I was of proceeding on my journey after so much lost time, I was obliged to consent to spend the remainder of this day and the night here with him, as he had been somewhat offended at my not doing so on my former visit to these parts. Spent the long day in conversation with the old chief and his party. I was much impressed with the amiability of the old man—so kind, so deferential, so intelligent. I felt it to be a treat to be with him: not but that I had known others such among the natives—thinly scattered, as it were, throughout the land—but this chief possessed such a calm, lovable countenance, with great simplicity, willing to be taught, asking many questions. Ah me! I parted from him with regret.

28th.—Rose early, and, divine service over, we paddled to Hereheretaunga, the usual landing-place where the track to Ruatahuna begins, the dear old chief and his

856 WC: I was at an early period obliged to have a good dog to guard my tent in my absence from it, the common dogs of the natives being so very numerous, lean, hungry, and thievish, some being remarkably expert at this work. I have known more than seventy to belong to one large village, and could relate many curious adventures concerning them.

people going with us. Arriving there, we cooked and ate our breakfast, and at 8 a.m. recommenced our journey. At sunset we arrived at Te Takapau, a village containing about thirty persons, situated in the midst of a dense forest, and close under the high hill of Ruatahuna, which gives its name to the district. The people here, who had been expecting us, having heard of us by those who had crossed the lake in their canoe on the 23rd instant, gave us a hearty welcome, and despatched messengers to Te Kotukutuku, a small village close by, and to Oputao, a large and fenced village about two miles distant, to inform them of my arrival, and before long all hands poured in to see me. I stayed several days in the Ruatahuna district prosecuting my inquiries, receiving much kind hospitality from the natives. Several of them, both here and at Waikare Lake, were now professing Christianity, and a few were able to read, books being in great request.

Here I conclude this portion of my long right-and-left and figure-of-eight journey from village to village in the then unknown interior, and several times and in different places making the beaches on the east and west coasts, finishing it at Waimate, Bay of Islands, on the 15th February, 1844, the whole distance being performed on foot.

As I had taken bearings by compass of several prominent spots, of the courses of the larger rivers; and also of my own track (wanderings), with the positions of the larger villages, I laid these down, at the Bishop's request on a large blank out line map of the North Island on my return to Te Waimate and the Bishop sent the same to England.

My dotted track [382] in the interior, &c., was subsequently engraved by Arrowsmith in a map of the colony. I have seen a copy of that map here in Napier some thirty years ago. During the Maori war in the interior under Sir George Whitmore my original MS. map of those parts, containing my track, with the villages, and rivers with their fords, was lent by me under service to the Government, and was, I believe, copied for them.

I may also mention that I had left the Bay of Islands on this journey in a small schooner on the 13th of October, and landed at Te Kawakawa, in Hicks Bay, on the 18th of that month, in a rising north-east gale. But when I say “landed” there, I should also explain that, owing to the heavy surf, our boat was soon capsized on entering the outer breakers, and I had to swim for life,—soon, however, helped by the Maoris, who had thronged the beaches expecting the disaster. This, too, was caused by the foolhardiness of the captain of the schooner, who persisted in leaving his ship, after coming to anchor a long way out from land, he having some small cargo to land there, although warned by the big white signal flying at the newly-established mission-station that there was no communication with the shore. I had also with me those two young Maoris whom I had taken hence two years before, and who had made with me my former long overland journey, and whom I was now returning to their home and tribe. They had warned the captain, through me, that there was no safe landing there at this time, but all to no purpose. The captain saved his big boat, with mast and oars (losing many smaller things), and, returning hastily—a wiser man—to his ship, was obliged

to cut cable and run away to sea. From Hicks Bay I again travelled on to Poverty Bay, as I did on the former occasion, but this time *incog.* (through want of clothing and tent and baggage, all such having been left on board of the vessel), by which, however, I learnt a little more of the Maoris.

**1894 Phænogams: A Description of a few more
Newly-discovered Indigenous Plants; being a
Further Contribution towards the making
known the Botany of New Zealand.**

Transactions of the New Zealand Institute 27: 383-399.

[*Read before the Hawke's Bay Philosophical Institute,
12th November, 1894.*]

Class I. DICOTYLEDONS.

Order VI. CARYOPHYLLÆ

Genus 2.⁸⁵⁷ *Stellaria*, Linn.

1. *S. pellucida*,⁸⁵⁸ sp. nov.

A perennial, prostrate, slender, rambling, weak, flaccid, creeping herb, 12 in.-18 in. long, growing profusely in

857 WC: The numbers of the orders and genera given here are those of them in the Handbook of the New Zealand Flora.

858 *Stellaria parviflora* Hook.f.

large beds or patches of several feet each way, rooting from nodes; stems containing one central capillary tenacious pith. Leaves dark-green, distant, opposite in pairs, suborbicular (generally broader than long), 1–2 (rarely 2½) lines diameter, apiculate, minutely punctiform with white dots, margined, margins slightly uneven with dark border (also midrib) underneath, base slightly decurrent; petioles flattish length of leaves, slender, with, a few weak hairs, connate and finely fimbriate. Flowers (noticed) very few; peduncles axillary, longer than leaves, 2- sometimes 3-flowered; pedicels a little longer, sometimes unequal, with a pair of large concave scarious bracts at base, 3 lines long, and another similar pair below the middle of the longer pedicel; bracts pale, ovate-acuminate, with a dark central line. Flowers very small; petals 0; sepals 5, 1 line long, ovate-acuminate, with broad white scarious margins, 3-nerved, nerves dark-purple; styles 3, rather large, rough; capsule produced, longer than sepals, broadly ovoid, very obtuse, white, very membranous, semi-transparent, seeds visible through it; seeds large for plant, 11, oblong-ellipsoid and suborbicular, turgid with a notch, bright cinnamon-colour with darker margins, minutely muriculate (under lens).

Hab. Interior deep forests near Dannevirke, County of Waipawa; March, 1894: W.C.

Obs. This plant was only detected in two low-lying localities in those dense forests, where, however, it forms large closely-overgrowing beds. Small and humble though it is, it [384] has given me much trouble—(1) in obtaining flowering specimens, for, though I brought away a large amount of it, gathered casually on first

seeing it (being struck with its pleasing, neat, and healthy appearance), believing it to be new, I found on diligent examination that I had not a single flower among them all. So, though the distance was considerable (for me, in my then present weak state), and I had grave doubts as to my again finding the localities, I went again to those woods, and after no small amount of trouble and weariness I found the spots, and sat down and spent a long time in overhauling the beds for flowers, and at last found only a few—about seven or eight—specimens. (2.) On close, patient examination I find this plant comes next to *S. parviflora*, Banks and Sol., and also to *S. oligosperma*, mihi (Trans. N.Z. Inst., vol. xviii., p. 267), but yet possessing characters which those species have not, and its own peculiar characters are also constant.

Genus 3. Colobanthus, Bartling.

1. *C. cæspitosus*,⁸⁵⁹ sp. nov.

Plant annual, small, bushy, erect, and spreading, 2 in.—3 in. high, much-branched from root, dark-green, glabrous; stems and branches slender, dichotomous. Leaves few, distant, in pairs on stems 5–8 lines apart, largely connate, narrow-linear, 3–4 lines long, $\frac{1}{25}$ in. wide, aristate, rather thickish, not rigid, opaque, recurved. Flowers numerous, small, terminal 2–3 together, and solitary axillary on stems, peduncles 3–8 lines long, slender, erect, filiform; perianth 1 line long; sepals 4 (rarely 6) ovate-elliptic obtuse with broad white margins; petals 0; stamens 4, opposite sepals; styles 4–5, stigmas largely penicillate, pale; capsule a little shorter than sepals, whitish; valves 4

859 *Sagina apetala* Ard.

(sometimes 5), very broad and truncate at tips. Seeds numerous, very minute, of various shapes—broadly cuneate, subreniform-dimidiate, or semi-orbicular and gibbous, tuberculate.

Hab. On the hills at Napier, in dry spots; 1894: W.C.

Obs. A species having affinity with *C. repens*, mihi (*Trans. N.Z. Inst.*, vol. xix., p. 261), and with other New Zealand species, but of a different size and habit, as well as possessing differential characters. It is also pretty closely allied to *C. kerguelensis*, Hook.f., differing in the obtuse and margined segments of its perianth, &c.

Genus *Cerastium*, Linn.

1. *C. amblyodontum*,⁸⁶⁰ sp. nov.

Plant annual, simple, erect, slender, 7 in.—8 in. high, very hairy. Leaves few, scattered, patent, pale-green; at base, 4, [385] small obovate-spathulate, 3—4 lines long, 1 line broad; on stem, 4—6 pairs, opposite, linear-oblong, 7 lines long, 2 lines broad, sessile, margins entire slightly sinuous, ciliate; hairs jointed acute; tip subacute; midrib wavy; veins largely reticulated; hairs on surface strigose, muricatulate, white, shining. Flowers few, 7 on each plant; in one specimen single throughout on main stem, alternate, $\frac{3}{4}$ in.—1 in. distant (and 2 flowers together lowest on stem, 1 of them smaller on shorter pedicel and nodding); in another specimen none on main stem but on forked peduncles at top, 3 on each peduncle with a single flower in fork at their bases; pedicels $\frac{1}{2}$ in. long, suberect, springing from a pair of leafy bracts with

860 Probably an introduced weed.

membranous margins. Sepals rough, green, subovate, much acuminate, with a strong central nerve, and very broad white, shining membranous margins, with tips rounded and produced beyond sepals. Styles 5, long, penicillate, flexuous. Capsule subcylindrical, more than twice the length of calyx, whitish, smooth, shining, curved, 10-nerved longitudinally, nerves straight prominent, ending in the notches between the teeth; teeth truncate, their lateral margins regularly recurved; capsule before opening greenish, tip subacute, Seeds broadly obcordate, subturbinate, with a notch at the narrow end, brown, tuberculate, tubercles numerous, minute, black.

Hab. On Tongariro Mountain, County East Taupo; 1893;
Mr. H. Hill.

Obs. A rather curious though humble plant; it sprang from turfs (see *Sagina*, the following plant), and was for some time overlooked by me (supposing it to be one of our cosmopolite British species, very common here) until after flowering, when it showed its extra-long shining white capsules; then, on examining it, I found several grave and peculiar characters, mentioned in description, particularly its strongly-nerved capsule, truncate teeth with recurved lateral margins, and curiously veined leaves with midrib deflexed. This very peculiar character is found in all its leaves. Its petals (if any) had fallen away, also stamens, but on one unripe capsule the five styles were perfect. In all the drawings with dissections (and descriptions) I possess of many species of *Cerastium* (Sowerby's, Hooker's, &c.) the teeth are always shown to be very acute, and the capsule cylindrical and nerveless. It may not be amiss for me to

call the attention of the botanical student and scientific reader of this description to another and somewhat similar indigenous species—*C. truncatulum*—also having peculiar broad truncate teeth, which, however, are cloven, described by me in a former volume of Trans. N.Z. Inst. (vol. xxv., p. 327). [386]

Genus *Sagina*, Linn.

1. *S. truncata*,⁸⁶¹ sp. nov.

Plant small, perennial, tufted, grass-green, 1 in.–1½ in. high; branches 3 in.–5 in. long, slender, procumbent, creeping, rooting at nodes; leaves—of tufts, numerous, very close, suberect and spreading, linear aciculate, 9 lines long, scarcely ½ line wide; of branches, much shorter, 5–7 lines long, sub-fasciculate, 5–8 together at nodes, subsecund, the outer pair connate, 5–8 lines apart on stems. Perianth 1 line long; sepals 4, oblong-ovate, obtuse, concave, equal, green; petals 4, often 0, very short, oblong obtuse, subhyaline, alternate with sepals; stamens 4, opposite sepals, slender, capillary, erect, at first longer than capsule; anthers orbicular, white. Styles 4, short; stigmas long, recurved, roughish subpenicillate, hairs (under lens) knobbed. Capsule suborbicular, longer than sepals, tip produced, sub-4-angled, opening by 4 valves, their tips very truncate; pale-green at first, whitish when ripe. Seeds numerous, pear-shaped, brown, roughish.

Hab. On Mount Tongariro, County of East Taupo; 1893:
Mr. H. Hill.

861 Probably an introduced weed.

Obs. I. This species certainly has close affinity with *S. procumbens*, Linn., which in some characters it resembles (*primâ facie*), an Australian and British plant; differing, however, in its leaves being much more numerous, fascicled 5–8 together at nodes (in that species only in pairs), and in their being aciculate, and subsecund on branches; in its flowers being always erect, not nodding, and mostly terminal; its petals, when present, very minute, smaller and of a different shape and structure; in the form of its capsule; and in the tips of the valves being very truncate, almost emarginate. I have closely examined it (living specimens), comparing it with drawings and dissections given by Sowerby and by Hooker, and descriptions by them and by Bentham (Australian specimens), and note the differential characters.

II. This little plant has almost a history. Mr. Hill brought it (possibly unnoticed) in a turf-like lump of earth with other very small plants; these were all crushed, withered, and apparently dead through long and close keeping and rough carriage, but I set them in a flower-pot, and last summer this one flowered, but the flowers were all eaten up by snails and slugs in one night before they were fully developed; so I had to wait till December in this year (1894), and the plant has flowered plentifully. In not more than 1 in 10 perianths have I found any petals.

[This genus, and the one preceding it, *Cerastium*, are not found in the "Handbook of the New Zealand Flora," but they both belong to this order, and are closely allied to *Colobanthus*.] [387]

Order XXXIX. COMPOSITÆ.

Genus 1. Olearia, Moench.

1. *O. multiflora*,⁸⁶² sp. nov.

A low much-branched close-growing shrub, 2 ft.–3 ft. high and 2 ft.–3 ft. diameter; branchlets bark, dull greyish-brown. Leaves alternate, chartaceous, about $\frac{1}{2}$ in. apart, broadly elliptic, petioled, $2\frac{1}{4}$ in.– $2\frac{3}{4}$ in. long, $1\frac{1}{2}$ in.–2 in. broad, margin upper three-fourths sinuate-crenate, crenatures few (5–8), distant, lower portion plain, grass-green, glabrous and shining above, pale greyish-green below, with closely appressed hairs (young leaves pale, and very hairy on both sides), tip acute; base truncate and slightly dimidiate, the right side shorter; midrib and veins hairy above, hairs white, appressed, glistening; midrib below stout and with primary veins coloured brown, prominent; the veins few, distant, alternate, curvilinear and intramarginal, and not at right angles; petioles stout, firm, subterete, $\frac{1}{2}$ in. long, channelled above, bases slightly decurrent, densely hairy, with closely appressed brown hairs (and so branchlets). Inflorescence subterminal and axillary, semi-erect in thick spreading many-branched corymbs, peduncles slender, subfasciculate, 3–6 together, sub 3 in. long, pale-grey, pubescent, each much and dichotomously branched at top into 3–5 subpeduncles, each bearing 2–4 heads; pedicels very slender, 2–3 lines long, each with a small linear-ovate bracteole, appressed at base. Heads very numerous, close, small, oblong, $2\frac{1}{2}$ lines long, 3 lines diameter. Involucral scales few, distant, imbricate in 4

862 *Olearia arborescens* (G.Forst.) Cockayne & Laing.

rows, ovate, hairy, the outermost shortest, the innermost longest, their tips truncate and very woolly. Florets—of ray, 8, limb white, 4-nerved, tip trifid, recurved, tube hairy;—of disk, 6–7, limb pale-yellow, 5-cleft, pubescent on outside; stigmas exserted, obtuse, rough; pappus few, erect, scabrid, acute, irregular, red-pink, shorter than florets, that of ray as long as tube. Achene linear, $\frac{1}{2}$ line long, angled, pubescent; hairs minute, white, glistening. Receptacle ridgy, with rather large intervening scales.

Hab. On Ruahine mountain-range, County Waipawa; 1893–94: Mr. A. Olsen, who also has the plant flourishing in his garden.

Obs. The alliances of this species are with *O. nitida*, Hook.f., and *O. populifolia*, Col. (Trans. N.Z. Inst., vol. xvii., p. 243), and *O. suborbiculata*, Col. (*l.c.*, vol. xviii., p. 263), but differing from them all in several characters. Its rose-red pappus gives the flowers a peculiar and pleasing appearance. The indumentum—flat, lanceolate, membranous—is of Bentham's Division I. [388]

Genus 3. *Celmisia*, Cass.

1. *C. ruahinensis*,⁸⁶³ sp. nov.

Rhizome stout, with many long straggling thick rootlets. Leaves 20–25, tufted, sub-narrow-oblong-lanceolate, $2\frac{1}{2}$ in. to 3 in. long, $\frac{3}{4}$ in. broad, subacute, coriaceous, glabrous green and obsoletely ribbed above (young leaves having a fine filmy-white scurfy indumentum), thickly coated below with sub-appressed light-yellowish-white wool, margins entire and subrevolute, midrib

863 *Celmisia spectabilis* Hook.f.

below obsolete, slightly contracted at petiole, which is as long as or longer than leaves, $\frac{3}{4}$ in. wide, increasing towards base, thin, purple, margin glabrous and free from hairs. Flowers 5; scape stout, twice length of leaves, cottony, subappressed; bracts several, distant, 9–12 lines long, finely subulate, thin, green above, cottony below, 3 lines wide at base, clasping, extending to head and there embracing involucre. Head $1\frac{1}{2}$ in. diameter, involucral scales numerous, subulate, erect, woolly at margins and tips. Ray-florets, ligula $\frac{1}{2}$ in. long, linear-spathulate, white, tips obtuse entire and slightly emarginate, tube glabrous, not thickened below; disk-florets, dark-yellow, glossy, 5-cleft; styles long, exserted from tubes, stigma linear-obtuse slightly and sparsely muricated; pappus few, erect, wavy, irregular, 1–2–3 lines long, scabrid, acute. Achene linear, terete, 2 lines long, quite glabrous.

Hab. Ruahine mountain-range, east side, County of Waipawa: *Mr. A. Olsen.*

Obs. A species near to *C. spectabilis*, Hook.f., from same mountain-range at higher altitude, differing, however, in several characters: in leaves, smaller margins entire, wool beneath semi-appressed and of a lighter colour, midrib not prominent, petioles thin, purple, not hairy; in ray-florets, ligula linear-spathulate, tips entire, tube glabrous and not thickened below; in longer exserted styles (both ray and disk), and in slender narrow-oblong obtuse, not deltoid, stigmas, which are very sparingly muricate.

Genus 7. *Bidens*, Linn.

1. *B. aurantiacus*,⁸⁶⁴ sp. nov.

Plant herbaceous erect, glabrous (*prima facie*), tops of stems (two specimens main stems) 10 in.–12 in. long, simple with a few small axillary branchlets above; stem hard, fibrous, $2\frac{1}{2}$ lines diameter, subangular, deeply striate. Leaves few, distant 4 in. apart on stem, trifoliolate, 3 in.–4 in. long, opposite; central leaflet ovate-acuminate, 2 in.– $2\frac{1}{2}$ in. long, $\frac{3}{4}$ in. broad, the two lateral ones opposite 1 in. long and broader in proportion, deeply and closely serrate; teeth large, regular, sharp, subfalcate and minutely serrulate; veins finely reticulate [389] below; petioles 1 in.– $1\frac{1}{2}$ in. long, semi-amplexicaul, with weak flexuous flattened hairs at bases; petiolules short, slender. Heads terminal, 2–3 together, each single one on a long peduncle 1 in.–2 in. long, slender striate bare, when two together a long leafy bract at base, hemispherical, 5–6 lines diameter, a leafy linear bracteole at base $\frac{3}{4}$ in. long, base fimbriate. Involucre slightly hairy at base, hairs weak white, bracts in sub 2 rows, the outer ones few, distant, shorter, linear-spathulate very obtuse, dark-green, three dark nerves, margins ciliolate; the inner sub-linear-ovate, acuminate, 3 lines long, tips obtuse and very pubescent, shining, dark-brown with broad yellow margins many-nerved (6–8), nerves dark-red, shorter than florets, with long linear erect yellowish scales between florets, longer than achenes, tips obtuse, 4-nerved; nerves dark-red. Florets sub 40, small, bright dark-orange: ray—few, tip of limb

864 *Bidens pilosa* Linn.

4-cleft, each lobe with a dark-red central nerve; disk—many, very small infundibuliform, 4-nerved, all much dilated at base. Pappus, three stout erect barbed awns $1\frac{1}{2}$ lines long, bright-yellow, glistening, appearing much above florets, the central awn shorter, sometimes but rarely 4 awns. Achene $2\frac{1}{2}$ lines long, linear subcompressed, flattish, striate, bright-yellow, slightly hairy on upper margins and on striæ, the outer ones shorter and stouter subobovate, with a few distant blunt mucros on their margins. Receptacle (fully ripe) with large alveolar sockets and broad white flattish smooth raised margins.

Hab. Woods at Te Kawakawa, near East Cape; 1894: *Mr. H. Hill.*

Genus 17. *Senecio*, Linn.

1. *S. heterophylla*,⁸⁶⁵ sp. nov.

A tall erect branching glabrous perennial herb, 5 ft.—6 ft. high; root-stems few, very stout, 1 in. diameter; much-branched about middle, and still more so at top, branches long slender; branchlets very slender, erect, and sparingly leafed, bearing terminal corymbs. Leaves of two sizes, narrow-lanceolate, acute, thin, roughish, very much and closely veined, dentate-crenate, teeth straight, their tips hardened, sharpish, sub 1 line apart, dark-green above, paler beneath, midrib prominent on underside; the larger leaves few distant scattered on main stems, 5 in.—6 in. long, $\frac{3}{4}$ in. wide, sessile and largely auricled, auricles much dentate; the smaller leaves numerous, 2 in.—3 in. long, 2–3 lines wide, almost linear, petiolate, subopposite

865 Possibly *Senecio minimus* Poir.

and close on small branchlets, springing from the axils of the larger leaves; the young half-developed leaves are very hairy, with short fugacious white hairs, but the single scattered smaller leaves on the upper branchlets are sessile and auricled [390] like the large ones. Heads small, in large loose-spreading corymbs. Peduncles and pedicels very slender, filiform, rather dry, $\frac{1}{2}$ in.–1 in. long, each having 2–5 scattered bracteoles. Involucre small, narrow-cylindric, 3 lines long, nearly as long as the florets, green, with a few small bracteoles at base; scales 9, narrow subulate, 3-nerved, with white scarious margins, their tips obtuse and slightly coloured, ciliolate. Florets sub 20, tubular, very slender, capillary, slightly campanulate at apex and dilated at base, greyish-green, glabrous, tips 3-fid, lobes laciniate, slightly tinged with yellow; stigmas spreading recurved subcylindrical scaberulous, tips thickened, dark-coloured. Achene linear, $\frac{1}{10}$ in. long, slightly grooved, scabrid on angles, ends obtuse, pale-brown, apex with a ring of very minute white hairs. Pappus slender, erect, white, shining, scabrid, tips acute, longer than florets. Receptacle raised, pustulate, slightly ridgy with minute toothed scales.

Hab. In deep forests near Dannevirke, County of Waipawa; March, 1894; also near Woodville, 1890: W.C.

Obs. This fine and striking herb differs considerably from all our endemic species of this genus. I had met with one small plant of it, about 1 ft. high, late in the autumn of 1890, near Woodville, which was long past flowering, and only retained 2–3 dry and withered involucres without fruit; and not having seen it since, though diligently sought, had all but given it up, when, most

unexpectedly, three years after I came on some very fine specimens in the forest. Unfortunately their larger leaves were all but quite devoured by small larvæ (apparently of some moth) that were feeding on them in great numbers.

2. *S. distinctus*,⁸⁶⁶ sp. nov.

Shrub 5 ft.–6 ft. high; branchlets (specimens) slender, erect, simple, 8 in.–10 in. long, 1 line diameter, much-ribbed-striate, leafy at tops, bare below. Leaves rather close, opposite, petiolate, 1½ in.–2 in. long, 9–10 lines wide, narrow-oblong-obtuse, slightly tapering, deeply crenate-dentate, the toothed portion peculiar in shape, and in appearance reminding one—*prima facie*—of the merlons of a battlement, each being 1–2–3-toothed, teeth hard and pointed, and often with a small tooth in the crenate hollow, glabrous and finely veined above, but closely covered below with whitish-grey scurf that becomes brown in age; venules very numerous, compoundly anastomosing; midrib prominent below; petioles slender, 5–10 lines long, striate, channelled above, slightly pubescent-scurfy. Flowers terminal in small rather loose leafy corymbs; the extreme peduncles very slender (almost capillary), ½ in.–¾ in. long, each bearing a single [391] head with two long linear bracteoles at base; floral leaves rather numerous, one generally at base of each pedicel, subobovate, ½ in.–¾ in. long, on long and very slender petioles. Heads small, obconical, sub ½ in. long, few-flowered. Involucral bracts 5 (sub 2 rows), thickish, slightly scurfy, linear-ovate, the 2 outer with tips acute, the 3 inner broader,

866 Possibly *Brachylottis perdicioides* var. *distincta* (Colenso)
B.Nord.

margins membranous, tips ciliolate. Florets few: ray—3, limb yellow, 10-nerved, 4-notched at tips; disk—4, pale, limb 6-lobed. Anthers and styles largely exserted; style curved, diverging, thick; stigmas truncate roughish. Pappus few, white, slender, scabrid, tips pointed bifid, shorter than floret. Achene glabrous, slightly striate, dark-brown, sublinear, thickened at top.

Hab. Woods between Poverty Bay and Tolaga Bay; 1894: *Mr. H. Hill.*

Order LIII. SCROPHULARINEÆ.

Genus 1. *Calceolaria*,⁸⁶⁷ Linn.

1. *C. (Jovellana) albula*, sp. nov.

Plant perennial, bushy, erect, 10 in.—12 in. high;—stems stoutish, striate, much-branched, rough (scabrid) pubescent; hairs substrigosely appressed. Leaves broadly ovate, tip subacute, $1\frac{1}{2}$ in.— $1\frac{3}{4}$ in. long, 1 in.— $1\frac{1}{4}$ in. broad, chartaceous, rough subhispid and muricatulate on both sides, dark-green above, very pale green below, with a reddish tinge; margins coarsely bi- or tri-serrate, their base common, and slightly subtruncate; petioles 9—10 lines long. Flowering-stems erect, slender, 6 in.—8 in. high, yellowish-green tinged with red; flowers in a compound loose panicle, 3 in.—4 in. long, many-flowered; subpanicles $1\frac{1}{2}$ in. long, opposite decussate, diverging, subcorymbose, each with several flowers on slender pedicels 3—4 lines long, $1\frac{1}{2}$ in. apart on main rhachis, the lowest pair with two leafy lanceolate bracts

867 *Stet.*

$\frac{3}{4}$ in. long at base; flowers erect, drooping, fugacious; calyx rather large, clasping (spreading in fruit), reddish-brown, rough-pubescent subhispid without, glabrous green and 3-veined within; segments 4, broadly deltoid, obtuse and subacute, not cut to base. Corolla suborbicular, 4 lines diameter, densely pubescent, white without, minutely purple-spotted within lower half; tube 0; lips concave entire nearly equal, the upper a little smaller, the lower scarcely incurved, margins thickened and largely pubescent, almost hairy; base of corolla within hairy, the hairs dense, long, wavy. Stamens short, stout, white; anthers orbicular; style erect, long, exserted; stigma small, capitate, penicillate. Ovary ovoid, glabrous, shining, tuberculate, tip obtuse. [392]

Hab. Margins of woods, hilly country between Napier and Taupo Lake; 1893–94: *Mr. W.F.G. Sturm.*

Obs. I. A species very near to *C. sinclairii*, Hook., differing, however, from it mainly in the smaller size and entire lips of corolla, which is white without, with minute pale-purple spots within below, and the hairs at the base of corolla within long and wavy, the stigma rough, and the ovary more obtuse, shining, and tuberculate.

II. Sir W.J. Hooker, in describing *C. sinclairii*, observes that “the corolla has both its lips concave and so far expanded as to approach that of *Jovellana*”; and that “it may, indeed, be considered a connecting-link between the two genera.” (“Icones Plantarum,” tab. DLXI.) Yet the inferior lip of *C. sinclairii* is 3-lobed. Had Sir William seen this plant, with nearly equal and entire lips not incurved, he would certainly have placed it under *Jovellana*.

2. *C. (Jovellana) sturmii*,⁸⁶⁸ sp. nov.

Plant erect, simple, very slender, 12 in.–16 in. high, few-leaved; stems reddish-brown compressed striate, slightly pubescent. Leaves distant, opposite in pairs (3–4 pairs on stem), 2 in.–3 in. apart, broadly elliptic, 2 in.–2½ in. long, 1¼ in.–1½ in. broad, very thin, spreading, slightly scabrous above, almost glabrous below, a few small hairs on veins; margins bi-serrate, teeth apiculate; tip subacute, base truncate; petioles very slender straight patent, 2 in. long., 1/25 in. wide. Flowers few, in a small loose terminal panicle, 1 in.–2 in. long, the lowermost pair of subpanicles opposite on rhachis 1 in.–1½ in. long; pedicels filiform, 2–3 lines long. Calyx green, slightly scabrid-pubescent, segments 4, deltoid, tips sub-acute. Corolla very small, thin, globular, 1/10 in. diameter, white with large purple spots within, lips nearly equal, their margins thin and slightly puberulent, the upper lip emarginate; base of corolla within glabrous; stamens short, stout; anthers cordate, large, white; style and stigma simple. Ovary shining, pitted minutely.

Hab. On the west side of the Kaweka mountain-range, near Napier; 1893–94: *Mr. W.F.C. Sturm.*

Obs. I. This species, like the preceding, is near to *C. sinclairii*, but differs more largely in general appearance and in size; its peculiar membranous leaves patent on long narrow (almost filiform) petioles, and very small flowers, with much less pubescence and thin margins, and anthers cordate, and glabrous throat of corolla, which

868 Possibly *Jovellana sinclairii* (Hook.) Kraenzl.

is also dark-purple spotted within, the spots larger and showing through the thin corolla.

II. I have seen and examined several specimens of this and of the other plant (*supra*), and find them to be remarkably regular throughout in their characters. I have also given a [393] large amount of time in close and repeated examinations of them, thinking, at first, they were merely varieties of *C. sinclairii*, and have concluded in their being distinct.

Genus 7. *Veronica*, Linn.

1. *V. venustula*,⁸⁶⁹ sp. nov.

A small compact bushy low shrub, 6 in.–9 in. high; branches and branchlets many, short. Leaves numerous, subdecussate and subimbricate, close, sub-obovate-oblong, 7–8 lines long, 4 lines broad, acute, patent, thickish, dark-green, glabrous, midrib rather prominent below at tip; petioles very short, stout, flattish. Flowers rather large for shrub, terminal, crowded in subcorymbs on short racemes 1 in.–1¼ in. long; pedicels 2½ lines long, puberulent; bracts subulate, acute, as long as pedicels, margins (as also sepals) ciliolate, the hairs glandular. Sepals sub-linear-ovate, as long as ovary. Corolla pure white (buds purple-tinted on outside before expanding), segments 4, 3 of them sub-ovate-acute, 1 smaller and narrower; tube as long as limb, throat pubescent; stamens erect exserted, longer than corolla; anthers purple, sagittate, tips obtuse, subversatile; style longer than stamens; stigma capitate. Capsule broadly-obvoid obtuse turgid, glabrous, dark-brown, 2½ lines

869 *Hebe venustula* (Colenso) L.B.Moore.

long, twice length of calyx—which also increases in size in fruiting. Seeds few, broadly-elliptic, 1 line long, thin, smooth, sub-plano-convex, light-brown, notched at one end.

Hab. On eastern side of Ruahine mountain-range, County of Waipawa; 1892–94: *Mr. A. Olsen.*

Obs. A neat-looking shrub of very compact growth, allied to *V. lœvis*, and to *V. buxifolia*, but differing from them in several characters,—as, leaves not keeled nor cordate, pedicels, long, sepals and bracts long narrow acute and glandular, flowers terminal forming thick heads, corolla tube long, and throat hairy.

Order LXXIII. PIPERACEÆ.

Genus 1. Peperomia, Ruiz and Pavon.

1. *P. muricatulata*,⁸⁷⁰ sp. nov.

Plant herbaceous, succulent, glabrous, glossy, ascending and erect, simple, 10 in.–12 in. high; stems stout, as thick as a goose-quill, green; rootlets produced from lower nodes where stem decumbent. Leaves few, alternate distant ($\frac{3}{4}$ in. apart on stem), orbicular and orbicular-obovate, 1 in.–1½ in. long, slightly tapering at base, 3-(the largest 5-) nerved, nerves apparent, anastomosing at tip and margins, dark-green above pale-green below, petiolate; petioles 3 lines long, semiterete, deeply channelled above, lateral edges at base decurrent. [394]

Spike (damaged) axillary, narrow, $\frac{1}{2}$ in. long; berry small, globular, muricatulate, dark-brown when ripe.

Hab. Woods near the East Cape; 1894: *Mr. H. Hill.*

Obs. A far more robust and different-looking species than the commoner N. one, *P. urvilleana*. I received several specimens, but, owing to their succulent nature, and long and close confinement in carriage hither, they were all but useless.

2. *P. novæ-zealandiæ*,⁸⁷¹ sp. nov.

Plant small, herbaceous, succulent, glabrous, cæspitose-bushy, erect, 12–14 branches from one rootstock; rootstock thick, irregular, knotty; rootlets numerous, terete, 1– $\frac{1}{2}$ lines diameter, hairy. Branches dichotomous, 4 in.–9 in. high, spreading, leafy above, bare below, striate; upper branches puberulent; hairs patent. Leaves opposite whorled, 4 and 3 in a whorl, broadly elliptic and suborbicular, 4–5 (rarely 6) lines long, 4–5 lines broad, rounded at both ends, numerous above (not crowded), thickish, slightly concave, dark-green above, paler below, minutely and irregularly punctiform, young leaves puberulent below with short white patent and distant hairs; veins obsolete fresh, but tri-nerved with many veinlets dry; petioles stoutish, subterete, 1– $\frac{1}{2}$ lines long, slightly pubescent, as also peduncles. Spikes terminal single erect, slender, $\frac{1}{2}$ in.– $\frac{3}{4}$ in. long, pale-green; peduncle slender, shorter than spike, 4–6 lines long; bracts (or squamæ) under fruit, circular peltate, margins finely ciliolate; anthers very small, pale, orbicular with a deep crease, intermixed throughout

871 *Peperomia tetraphylla* (G.Forst.) Hook. & Arn.

spike, filaments very short. Berry ovoid, $\frac{1}{20}$ in. long, tip produced obtuse, reddish when ripe.

Hab. Woods near the East Cape; 1894: *Mr. H. Hill.*

Obs. A peculiarly neat little plant, very different from all other species of this large genus known to me; unfortunately, it does not dry well, though better than the preceding species, from which the large fleshy leaves all fall away in drying.

Order LXXIV. BALANOPHOREÆ.

Genus 1. *Dactylanthus*, Hook.f.

1. *D. taylori*, Hook.f.

[For description, see "Handbook of the New Zealand Flora," p. 255. I mention this highly curious, peculiar, and very scarce plant (it having only been met with twice during the last fifty years since its first detection by the Rev. R. Taylor—once by Mr. A. Hamilton, near Tarawera, Hawke's Bay, and now by *Mr. H. Hill*), though not quite new, to give its new *habitat*—woods near the East Cape, whence Mr. Hill brought some very fine specimens, unfortunately, however, like the preceding, much damaged in long transit.]. [395]

Order LXXV. CONIFERÆ.

Genus 3. *Podocarpus*, L'Héritier.

1. *P. montana*,⁸⁷² sp. nov.

Plant a low rambling shrub of diffuse growth. Leaves numerous close subimbricate on all branchlets, subsex-fariously disposed, oblong-lanceolate, 3 lines long, apiculate, thickish, slightly falcate, spreading and recurved, yellowish-green, glabrous; midrib prominent on both sides and with the margins thickened, striate longitudinally (*sub* lens) in minute stippled white (glaucous) striæ; petiole 1 line long, much decurrent, raised from one leaf to another, giving the branchlet a ridgy appearance. *Male*: Catkins axillary, erect on a slender peduncle 3 lines long, having a thin brown oblong scarious bracteole 2 lines long at its base in front, its tip jagged; usually 3 (sometimes 2) spikes together, the central one longest, very slender as long as peduncle, sessile, red; 2 lateral bracts sub 2 lines long at their base, patent, green, oblong, subapiculate, thickish; the peduncle marked with decurrent sunken lines from them; between, in front, 3 small bracteoles, green, concave, appressed, tips entire and subacute; and, behind, 3 others, smaller, thinner, concave, with their tips jagged; anthers sub-broadly orbiculate, their tips, or connectives, 3-fid or jagged. *Female*: Ovule ovoid, subacute, 2 lines long, sessile on thickened peduncle, bright-red, subglobular or somewhat turbinate, $\frac{1}{4}$ in. long, fleshy, juicy, edible, with 2 small lateral acute points or horns, 1 on each side of ovule (sometimes, but rarely, 3), the lower part of peduncle slender, green, short, axillary.

872 *Podocarpus nivalis* Hook..

Hab. High up on Ruahine mountain-range, east side, County of Waipawa; April and December, 1894: *Mr. W. F. Howlett.*

Obs. I. A species near to *P. nivalis*, Hook.f. (also discovered on same range, west side), but differing in its smaller leaves, slenderer amentæ which are also much bracteolate at their bases, and with the tips of their anthers jagged, somewhat resembling those of *P. totara*, but those of *P. totara* are larger, more produced, and more largely jagged. In one of my specimens there are three peduncles of male spikes very nearly forming a whorl near the top of a branchlet, two bearing each 3 and one 2 spikes. This species is also nearly allied to *P. alpina*, Br., a Tasmanian and Victorian species, which mainly differs in its produced connectivum ("connectivo apice in cornu producto") and in its spikes being "sessile and solitary," &c.—a plant, too, found there at "from 3,000 ft. to 4,000 ft. altitude," much the same as these two here in New Zealand. [396]

II. I can quite fancy it becoming an interesting and useful scientific study in "days to come" for some future botanist to take up those three species (*P. alpina*, *P. nivalis*, and *P. montana*), and, being well supplied with fresh specimens of them all in their various states, to enter on a close and exhaustive examination and dissection of them, to ascertain whether they are not varieties of one mountain species.

Class II. MONOCOTYLEDONS.

Order I. ORCHIDEÆ.

Genus 11. Caladenia, Br.

1. *C. macrophylla*,⁸⁷³ sp. nov.

Stem stout below, glabrous; slender above with leaves and flowers glandular-hairy, 4 in. high. Leaves 2 together within 1 sheath near base, 1½ in. from it, the larger and outer leaf ovate acuminate acute, 2 in. long, 1 in. broad, 6-veined, margins ciliolate with weak white ciliolæ; the inner one much smaller, sublanceolate acuminate; green, brownish spotted, chartaceous; at top of scape a sheathing bract acuminate half embracing ovary, both also glandular-hairy. Flower single, sub 1 in. broad expanded, whitish with a tinge of pink, membranous. Dorsal sepal obovate-oblong, much veined, incurved, tip subacute; lateral sepals 7 lines long, linear oblong acuminate; lateral petals shorter and narrower, linear subacute; labellum oblong-obovate, no claw, veined, tip rounded, 2 rows of small yellowish ridgy calli subconnected, one on each side of the middle line from the middle of labellum to base, increasing in size downwards, column largely incurved, the tip hooded, winged laterally and equally throughout. Ovary long, slender.

Hab. Ruahine mountain-range, east side; 1894: *Mr. A. Olsen.*

Obs. A plant that has caused me much trouble as to fixing its proper genus; it is certainly near *C. (?) bifolia*,

873 *Aporostylis bifolia* (Hook.f.) Rupp & Hatch.

Hook.f. (*Chiloglottis*, Mueller), and, were it not for its completely hooded column, from its wings being continued unbroken over it, I should have preferred placing it under *Chiloglottis*, this genus having its “column 2-fid at the tip” (Hook., *l.c.*, p, 269).

Order VII. LILIACEÆ.

Genus 4. *Dianella*, Lamarck.

1. *D. reflexa*,⁸⁷⁴ sp. nov.

Leaves distichous, sheathing at base, 20 in.–24 in. long, 6–7 lines wide, subcoriaceous, linear acuminate, green on both sides, shining above, margins and keel (prominent) entire, or [397] very slightly and distantly scaberulous with small dark-brown spots, margins somewhat revolute. Flowering-stems erect, slender, dark-green, terete, smooth, 18 in. high, a single thin leafy bract 1½ in.–2 in. long near base; panicle loose, 10 in.–12 in. long; subpanicles few, 2½ in.–3 in. long, branched, spreading, 1½ in.–2 in. distant on stem, alternate; bract at base 1 in. long, sessile, membranous, subulate acuminate, green; branchlets very slender, 3–4 flowers on compound capillary pedicels, each 5–9 lines long, with a minute bracteole at base. Flowers: Buds (*alabastron*) linear, 2 lines long; perianth expanded 4½ lines diameter, segments membranous, glabrous, recurved, unequal; 3 outer narrow-oblong, tips obtuse tufted with short hairs, outside purplish, sides white, margins purple, many (5–6) nerved, nerved black; 3 inner broadly oblong, white, shining, tips emarginate, 3-nerved, nerves greenish. Filaments erect, a little shorter than style, the basal two-

874 *Stet.*

fifths white, the upper three-fifths bearded dark-orange thickening upwards close to anther, obovoid; anther pale-yellow, linear, narrower than filament, sessile. Style erect, stoutish; stigma simple, small. Ovary subglobose, glabrous, shining.

Hab. Woods near East Cape; 1893–94: *Mr. H. Hill.*

Obs. I. After a long and extra careful examination I believe this plant to be distinct from *D. intermedia*, Endl., and also from *D. nigra*, mihi (Trans. N.Z. Inst., vol. xvi., p. 339). Of *D. intermedia* little is given as to specific characters in Hooker's "Flora Novae Zealandiae" and in the "Handbook of New Zealand Flora," but fortunately I possess Endlicher's "Floræ Norfolkicæ," in which he gives a very long and elaborate description of *D. intermedia*, originally discovered in Norfolk Island: A few of its prominent characters I here give, to show its difference from this plant: "Folia marginibus carinaque aculeato-serrulatis. Scapus basi tereti compressus, apice angulatus. Ramuli arcuati pedicellique nutantes angulatotetragoni, quatuor lineas longi. Perigonum sex-partitum aequante, substellato-patens. Foliola tria exteriora oblonga obtusa, extus virescentia; ... interiora conformia, medio viridia. Filamentia, ... apice in massam ovatam flavam. Antherae viridi-flavescentes." (*Loc cit.*, p. 28.)

II. I have mentioned *D. nigra*, mihi. This species, I find, is disallowed in "Index Kewensis," stated therein to be = *D. intermedia*, Endl.; but this I cannot agree in, seeing that it does not square with Endlicher's description, as shown by me in my full description of my plant (*l.c.*). One thing, however, is pretty certain: that the species are

difficult to determine. Hooker fil., in his "Flora Tasmaniæ," says of this genus, "About ten Australian and Tasmanian species are known to me. They are very difficult to discriminate. ... The stamens appear to me to afford the best character" [398] (*l.c.*, vol. ii., p. 56). I wholly concur in his remark on the stamens. Bentham, in his "Flora Australiensis," enumerates twenty-one species. Of these he gives only five as Australian, disallowing sixteen. Many of them were also described and figured by eminent botanists. He also says, "In their typical forms the five Australian species are very distinct, but they are all so variable, and connected by so many intermediates, that I have found it very difficult to distribute satisfactorily the numerous dried specimens before me. It is not impossible, however, that a careful study of living plants in their native country may disclose more positive characters to distinguish even twice as many more or less permanent forms" (*l.c.*, vol. vii., p. 14). In this remark I fully believe, and have acted upon it in examining and describing my two species, both from living specimens. And, later still, in "Index Kewensis," out of forty described species therein brought forward, only thirteen are allowed to stand. I may further observe that *D. intermedia*, Endl. (or our northern New Zealand plant), was pretty common at the north, among fern (*Pteris esculenta*), in the dry hilly grounds, and on margins of woods; but I have never seen it here. *D. nigra* I have only seen in two localities here south in thirty years; and this plant now described by me, Mr. Hill says he had never seen before.

Order XI. Cyperaceae.

Genus 14. Carex, Linn.

1. *C. smaragdina*,⁸⁷⁵ sp. nov.

A low densely caespitose flaccid glabrous dark-green species of very peculiar aspect. Roots numerous, wiry, short. Culms 10 in.–14 in. long, $\frac{1}{20}$ in. wide, very slender weak flat striate, with 2–3 short leaves near base, spread all around flat on the ground together with the leaves forming a circle. Leaves one-third length of culms, narrow linear acuminate, grasslike, $\frac{1}{10}$ in. wide, minutely serrulate at tips (*sub lens*), slightly and distantly so below, generally 3 together with 3 sheaths at and near base, sheaths with netted veins, their tips obtuse and apiculate. Spikelets usually 3, sometimes (but rarely) 5, very close together, forming a small head or cluster, sessile, subquadrangular, stout, $\frac{1}{4}$ in.– $\frac{1}{2}$ in. long, 2–3 lines wide; bracts 2, unequal, 3 in. and $1\frac{1}{2}$ in., leaf-like, very narrow, the smaller one filiform, thin; glumes broadly ovate, acuminate, white with dark-green central nerve, tips serrate. Utricle as large as the glume, broadly ovate-lanceolate, plano-convex, green without and at margins below, pale-fawn within, many-nerved, nerves prominent, beak produced, sharply bicuspitate; stigmas 2, long, roughish, much curved, brown. Anther (?) linear, acute, serrulate at tip. [399]

Hab. Interior deep damp forests at Dannevirke, County of Waipawa; March, 1894: W.C.

875 *Carex inversa* R.Br.

Obs. A highly curious species, differing much from any other of this genus known to me; its bushy decumbent dark green spreading aspect is most striking. It was plentiful there in two spots; but, though I brought away many specimens, I have not detected any male flowers save *one* old anther at the base of a spikelet; and, on seeking fresh specimens in the following summer season, I found the whole forest had been felled and burnt, thus destroying much valuable timber!

**1894 A Description of two New Ferns and One
New Lycopodium, lately detected in our New
Zealand Forests.**

Transactions of the New Zealand Institute 27: 399-
401.

[*Read before the Hawke's Bay Philosophical Institute,
12th November, 1894.*]

Genus 2.⁸⁷⁶ *Hemitelia*, Br.

1. *H. microphylla*,⁸⁷⁷ sp. nov.

Trunk erect, 9 ft. to 10 ft. high, stout, girth nearly equal throughout, at base 20 in., near top 21 in., with numerous old and dry bleached stipites (without their pinnæ)

876 WC: In "Handbook of the New Zealand Flora" included in
Cyathea.

877 *Cyathea smithii* Hook.f.

hanging down from below crown. Fronds, rather few, 15, spreading, horizontal, sub-oblong-lanceolate, broadest above middle, $5\frac{1}{2}$ ft.–6 ft. long, 2 ft. 6 in. wide, bipinnate, grass-green above, pale-green below, softish, densely clothed with light-brown scales and hairs; rhachis dark mahogany-brown and glossy below, with a pale continuous raised line above, lateral from pinna to pinna; stipe short, sub 5 in., very scaly, scales long. Pinnæ linear-oblong, tip very acuminate, 13 in. long, $3\frac{1}{4}$ in. wide near base, $3\frac{1}{2}$ in. apart on rhachis, opposite, leafy to base; pinnules regular, close but not imbricate, $1\frac{1}{4}$ in. long, $\frac{1}{2}$ in. wide, broadest at base, lower pair of segments pinnate and overlapping rhachis. Segments linear-oblong, entire, sometimes slightly crenulate, sub-serrate-crenate at tip; tip acute submucronate. Sori orbicular, regularly disposed at base of lowest pair of forked veins, 2–4 on a segment. Involucre rather large, concave, three-fourths round sorus, gaping, persistent, closed on costal side, pale, with dark centre, margin [400] even. Receptacle pale, erect, broadly ovoid, pilose. Veins few, usually 5 pairs, the lower 2–3 pairs forked, single above, alternate, clear, white, not extending to margin. Scales very numerous and of different sizes, narrow, subulate; of stipe 1 in., of frond 2–3 lines long, brown, with many dark (black) veins, the central ones parallel from base to apex, forming long vertical loops, the lateral ones anastomosing freely, the sides of scales subtranslucent, margins entire above, irregularly and slightly sharp-serrate below, their bases dilated and finely laciniate (a truly remarkable sight under a microscope).

Hab. In dense forests north-west from Dannevirke, County of Waipawa; 1894: W.C.

Obs. I. A species near *H. smithii*, Hook.f., but differing in several characters; as, acuminate pinnæ, smaller entire segments, colour, pilose receptacles, and very peculiar and largely-veined scales of a different colour, &c. Its general appearance is also very different, especially young plants with trunks 4 ft. to 5 ft. high (before they bear sori): these have a very striking appearance; their pleasing vivid grass-green colour, small segments, and densely scaly fronds arrest the beholder's eye and attention.

II. I have long been of opinion that greater scrutiny should be given by pteridologists (not mere amateurs, fern-growers, and collectors) to the *scales* of ferns—their form, consistency, venation, colour, and structure. Nature is ever great, true, and constant in what men term *small* things.

Genus 11. *Adiantum*, Linn.

1.A. *viridescens*,⁸⁷⁸ sp. nov.

Plant small, indistinctly sub-pedate-deltoid, acuminate; stipe 4 in.–5 in., dry, channelled on upper surface, bright red-brown; frond 5 in.–6 in. long, bipinnate, pinnæ 2, sometimes 3, pairs, tripinnate at base of 2 lower pinnæ; pinnules stipitate, free, rather distant, glabrous, shining, grass-green on both sides, thin, flat; main segments narrow, sublinear, oblong, 7–8 lines long, 2 lines wide, falcate, lower margin entire; upper margin sublaciniate; barren laciniæ serrate, teeth white produced sharp; fertile very broad, rounded, incurved over involucre, with orbicular space between, margins white; terminal

pinnules very long, narrow ovate-acuminate; stipes, rhachises, and petioles scaly and hairy; scales and hair bright red-brown, very long and curly; basal scales dense, flat, subulate, 1 in.–1½ in. long veins netted. Involucres few (4–6) on upper margin, large orbicular, flat, with a very deep sinus corresponding with laciniæ; white, membranaceous (hyaline young), with dark centre,—gaping, brown, crisped and curled in age. Veins numerous, branching, having in larger segments [401] and in terminal pinnule a middle vein which is pinnate and forked, 2 pairs (4) to each involucre.

Hab. Wooded district, Kumeroa, near the River Manawatu.

Obs. A neat species allied to *A. fulvum*, Raoul, but differing from that species in its smaller size, bright-green thin glabrous shining narrow finely cut and more stipitate pinnules, large orbicular hyaline and flat involucres, largely-branched compound venation, and its very hairy and scaly bright red brown stipe and rhachises.

Order II. LYCOPODIACEÆ.

Genus 2. *Lycopodium*, Linn.

1. *L. polycephalum*,⁸⁷⁹ sp. nov.

Plant (dried specimens) erect, stout, 9 in.–10 in. high, main stem woody, as thick as a goose-quill, much and dichotomously branched throughout; branches erect, their tips (heads of spikes) drooping recurved. Leaves very

879 *Lycopodium cernuum* L.

numerous, mostly vertical adpressed, sometimes patent, $\frac{1}{2}$ in. long, subulate, semiterete, acute, entire not keeled, smooth, shining, wavy, inserted about six rows on all the stems and branches, close, imbricate. Spikes terminal on all branches, 1–2–3 together, subcylindrical, oblong-ovate, obtuse, sessile, sub $\frac{1}{2}$ in. long, pale yellowish-fawn colour; scales in about 8 rows, very close and largely imbricate, $\frac{1}{10}$ in. long, ovate-acuminate, rough on outside, margins serrate, tip produced long entire acute; capsules suborbicular, white, shining narrower than scale.

Hab. High land near East Cape; 1894: *Mr. H. Hill.*

Obs. A species allied to *L. densum* and to *L. cernuum*, particularly the latter, but differing from that species in several characters—in smaller leaves that are vertical shining and not keeled, spikes several together and not incurved, points of scales not serrate, &c.

1894 An account of the finding of two Australian plants, hitherto unnoticed, here in New Zealand.

Transactions of the New Zealand Institute 27: 401-402.

[*Read before the Hawke's Bay Philosophical Institute, 12th November, 1894.*]

1. *Erythræa australis*, Br.

An erect glabrous annual, from under 6 in. to $1\frac{1}{2}$ ft. high, the branches few and not very spreading. Leaves sessile,

ovate-oblong elliptical or lanceolate, mostly obtuse; the lower [402] ones stem-clasping, nearly 1 in. long. Flowers nearly sessile along the more or less elongated branches of the once-forked or dichotomous cyme, with a leafy bract under each flower, thus forming one-sided interrupted leafy spikes. Calyx narrow, 3–4 lines long, with 4 (rarely 5) angles and acute teeth or lobes. Corolla-tube usually exceeding the calyx, but sometimes shorter; lobes ovate or oblong, much shorter than the tube. Capsule oblong, shorter than the calyx. Seeds small, reticulated-striate.

Hab. Woods, highlands near East Cape; 1893: *Mr. H. Hill.*

Obs. This species, the only one in Australia, where it is generally found in all the colonies, and also in Tasmania, is also in New Caledonia and the Loochoo Islands, and is said to differ only from *E. spicata* (a species common in the Mediterranean region, and eastward at least as far as Afghanistan) in the flowers, usually but not commonly 4-merous.

2. *Alisma plantago*, Linn.

Rootstock perennial, sometimes very hard, and almost bulbous, with the thickened sheathing bases of the petioles. Leaves ovate-oblong or elliptical, shortly acuminate, 3 in. to 4 in. long in well-grown specimens, usually 7-nerved, the transverse veinlets very oblique, not close, and more or less contracted by reticulations. Flowering-stem 1 ft. to 4 ft. high, with a large loose panicle, often above 1 ft. long, with whorled divaricate branches and pedicels. Outer perianth-segments ovate striate persistent, above 1 line long; inner ones twice as

large, of a pale-pink, very fugacious. Carpels 15 to 20, obovate, laterally flattened, 1 to 1½ lines long, bearing the remains of the style on the inner edge below the apex, and marked on the back with an impressed or slightly prominent dorsal nerve, the whole forming a flat ring of 2½ to 6 lines diameter with a depressed centre.

Hab. In watercourses on the banks of the River Tukituki, east of Napier, Hawke's Bay; 1892 and 1893: *Mr. H. Hill.*

Obs. This species is found in New South Wales and in Victoria, and is also frequent in many parts of Britain by lakes, streams, and ditches. Mr. Hill first met with it in 1892, but long past flowering, and much decayed in its package when it reached me, so I was obliged to wait another year, when, again through the kindness of Mr. Hill, I obtained better specimens.

As there is no difference that I am aware of between those two plants found in New Zealand by Mr. Hill and the Australian ones, I have used Bentham's able descriptions of them, copied from his "Flora Australiensis."

1894 The modern history of a block of greenstone.

Transactions of the New Zealand Institute 27: 598-606.

[*Read before the Hawke's Bay Philosophical Institute, 12th November, 1894.*]

A FEW peculiar public occurrences of this present time (the middle of September, 1894) have set me a-thinking at almost, a right angle—in a strange kind of way. But first, and very briefly, of the said occurrences, which are four in number: (1) The death of the Maori king, Tawhiao, at his own village in Parawera; (2) the death of Henare Matua, a chief of the Ngatipahoro family, an able and popular man, well known in the Native Land Courts, and at many public political Maori meetings, both far and near, with whom many of our “early settlers” have had extensive dealings; (3) the death at the same time (7th September) of a well-known and respected aged Maori of note, Noa Huke, for several years (1848–53) a useful and faithful Christian teacher of mine; and (4) his burial at Omaahu on the 18th September. These events, taken together, have produced within me “things unattempted yet in prose or rhyme,” and, united, are the efficient cause of my writing this paper, as you may see.

(Here I quote from my old Maori-written relation:) “Of the huge stone: Many years ago this big lump of greenstone = *pounamu* was purchased from a European in Cook’s Strait by the Ngatiraukawa Tribe there residing, and from that time it lay quietly in their

possession until the death of Moses Tarapuhi.⁸⁸⁰ When the Hawke's Bay tribe (Ngatikahungunu) heard of his death they arose in a large body from these parts, as far as Porangahau inclusive, and travelled to Manawatu, and on to the west coast to Foxton, to the funeral; and while there the big greenstone was publicly brought forward and ceremonially placed and presented by the Ngatiraukawa Tribe to their visitors from Hawke's Bay, at the same time naming the said stone 'The Tears of Ngatiraukawa.'⁸⁸¹ On their visitors leaving, the big lump was put on board of a canoe, which was poled up the River Manawatu to Moutoa. From this village it was fetched by the [599] Ngatipakapaka Tribe, and taken by them to the village Te Hautotara, on the Upper Manawatu, where it remained quietly for a long time, the admiration and wonder of all beholders. Some years elapsed, and then it was borne in a litter by Ngatipakapaka to Porangahau, and transferred to Henare Matua; and some time after it was handed over by Henare Matua to Te Harawira Tatere,⁸⁸² who had it carried to his village at Waimarama (near Cape Kidnappers), where it also remained for a long time in his possession, until finally it was taken by him and his people to Napier, to be sawn, into slabs of proper

880 WC: Moses Tarapuhi was a chief of some note who had formerly, and for some years, resided in the Bay of Islands. A few years after I had settled in Hawke's Bay he and his wife, who had known me there, arrived here, and, after staying some time, went on to the west coast, near Foxton.

881 WC: "Ka tapaetia te tapae, 'Nga Roimata o Ngatiraukawa.'"

882 WC: In the law-courts, *infra*, he is named Orihau. Like many other chiefs, he bore two names.

thickness for the purpose of being afterwards cut up into fit portions for *meres* (or hand-clubs), after the fashion and taste of the Maoris, he, Te Harawira, having arranged with a white man in Napier to saw up the said block of greenstone for him; but from this time it became wholly lost to the Maori people." (Thus far the written relation by the Maoris.)

In the year 1878 the said block of greenstone was brought by Te Harawira to Napier, he having arranged with a European named James Rolfe, residing there in Emerson Street, to cut it up for him. Some time after, I, on hearing of this work, visited Rolfe's workshop to see the operation, and found him and his wife closely engaged in carrying on the work. It was a small room; two or three small saws were in brisk movement, worked by steam; and, though I stayed some time, and closely watched their cutting, they seemed to lack power, so that when I left I could not but believe, at the rate; they were then going on, it would take a very long time to accomplish the intended work, their simple and almost improvised makeshift machinery wanting power.

In 1881 Rolfe, having some time before completed his task, and finding he could not get the owner and his friends to come to any satisfactory terms, brought the matter into Court before the Resident Magistrate; but on this occasion Rolfe was nonsuited, on the ground of insufficient evidence.

Two years after, in 1883, 19th February, the matter came again into Court this time into the District Court, before Judge Hardcastle, when Mr. Lascelles was the solicitor for Rolfe, and Mr. Lee for Te Harawira.

Rolfe's amended claim (now) was for £190, for cutting up the said block of greenstone. In his statement he said that the block weighed about 3cwt.; that the agreement between himself and Te Harawira was for him to cut up the block into twelve cuts (or slabs), for which work £200 was to be paid by instalments. That on the next week Te Harawira called and [600] paid him £10, as the first instalment, but that nothing had been paid since. It took him two months to make the first trial cut, and nine months to make eleven cuts. That he had eleven saws at work at one time by steam-power, ten to fourteen hours a day. When the work was finished, and after much talk with Te Harawira and his friends, a compromise was offered of £100 to be paid to him, together with half of the greenstone, and to this he agreed; but, after long waiting, no money was forthcoming. He had also offered to take the stone (slabs) as payment for his heavy labour, but this was refused.

Mr. Cooper, a watchmaker and jeweller of Napier, stated that he was acquainted with similar work—the cutting-up of greenstones—and 1s. per square inch was the usual charge; and, speaking from memory, those cut slabs of greenstone would each average about 24 in. × 15 in.

Te Harawira (the defendant), in his evidence, stated positively that no final agreement as to price had ever been arranged, and that the charge for cutting was far too high.

Mr. Lee, for defendant, held that no contract had ever been made, and that the charge was excessive.

The Judge took time to consider his sentence, and on the next day judgment was given for £150, and costs £14 3s.⁸⁸³

No money being forthcoming, in the following month (March) the bailiff took possession of the greenstone, under execution warrant of distress, and duly advertised for sale by auction on the 14th, at noon, "12 slabs greenstone; average weight 251b. each."⁸⁸⁴

I happened to be in town on that day, and in passing by the auction-mart, and seeing some acquaintances standing at the entrance, I went up to speak with them, and then, for the first time, saw the said twelve slabs of greenstone inside on a table. So I went in; and soon after the sale began, when I purchased five slabs, and should have bought more had not my acquaintances expressed their wishes to get some also. The whole lot only realized £20 10s.⁸⁸⁵

No. 1 greenstone	*£1	0	0
No. 2 "	0	10	0
No. 3 "	1	2	6
No. 4 "	1	5	0
No. 5 "	*2	0	0
No. 6 "	*2	15	0
No. 7 greenstone	£1	2	6
No. 8 "	*2	5	0
No. 9 "	1	5	0
No. 10 "	*3	0	0

883 WC: *Hawke's Bay Herald*, 20th and 21st February, 1883.

884 WC: *Daily Telegraph*, 13th March, 1883.

885 WC: Account Sales, Twelve Greenstones.

No. 11 "	1	12	6
No. 12 "	2	12	6

From which sum was deducted: Commission, £1 0s. 6d.; bailiff's charges, £3 13s.: leaving £15 16s. 6d. (From District Court records.) The slabs purchased by me are marked with a star. [601]

Mr. William Broughton; from Renata's village at Omaahu, was present at the sale, and purchased one of the slabs. At this time the Maori king, Tawhiao, had recently arrived at Omaahu from Wellington, *via* Waipawa; and I, who had long known Mr. Broughton, gave him one of the slabs I had just purchased as a present to the Maori king, Mr. Broughton taking it away with him in his dog-cart. I should mention that I had been invited by Renata to attend the public meeting and banquet given by him at Omaahu on the following day.

The next day I went to Omaahu. A pretty full description of what took place there, on that occasion was given in the Napier papers, from which I extract one sentence respecting the said slab of greenstone: "A big bell rang. Tawhiao came out of a large *whare* (Maori house), and was met by Renata, who, with a finished courtesy which, would have done no discredit to a European host, took him by the hand and led him to the seat of honour in the tent, before which stood a large slab of greenstone, a present from Mr. Colenso."—(*Hawke's Bay Herald*, 16th March, 1883.)

Dinner over (which was a large one), "King" Tawhiao walked leisurely back to his tent and clan, carrying carefully his large greenstone prize closely laid across his

breast. Kings, emperors, and mighty chiefs of other countries and peoples, both Christian and heathen, have often from time immemorial dined off gold plate, but I fancy no Maori chief before Tawhiao ever dined off a flat greenstone dish!—no doubt in his opinion, and in those of his ancestors, of far greater value than gold itself.

Subsequently I got three of them roughly polished on one side by our monumental stone- and marble-mason, Waterworth, who did not, however, readily undertake the work, as such a stone was well known to be very hard, and had not hitherto been worked by him.⁸⁸⁶ Two of those slabs I show here to you this night; one of them, also, being an outer slab of the original block, is peculiarly worn and irregularly rounded on the outside, somewhat resembling some of those big abnormal lumps and nodules of limestone and of flint (pot-stones) found in chalk at Home, and like them in having a thick white incrustation closely investing.

And so it was that on my again visiting Omaahu in September, at the funeral of Noa Huke (as mentioned by me in my “Introduction”), being also the *first* time since that other public visit of mine in 1883, the place, the greenstones, the circumstances past and present, the men (including the [602] Maori “king,” Noa Huke, Henare Matua, Renata Kawepo, Te Harawira, and others, chiefs of note, and prominent” speakers and actors on that former occasion—*all now gone*), afforded ample themes

886 WC: I may mention his charge for so doing was £1 15s. for the first and £1 10s. each for the remaining two.

for reflection during my solitary long drive back to Napier in a cab, and in pouring rain.

The New Zealand greenstone, called generally by the Maoris *pounamu*, of which, however, they have several varieties, each bearing its own proper name, has always been a prized article among them—indeed, of the highest value as a possession, as riches, as heirlooms, and as a commodity of barter. Many causes combined to make it such, principally its great usefulness among a people that knew not metals—whether manufactured as a weapon in war, as an implement' in house- and ship-building, or as an ornament of personal decoration for their chiefs, to which must also be added its rarity (as to habitat), only now found in one known locality in the South Island, from which place it could only be obtained by great perseverance and courage, combined with skill, labour, cunning, and peril. And then, above all, was the ancient superstitious belief that it was a living animal, *ika* = fish, that could only be secured through the due and unbroken observance of many peculiar and wonderful incantations, charms, and prayers; and, when so acquired, the patient persevering labour and skill requisite in cutting it up and fashioning it symmetrically and suitably for use was really marvellous. I will here give two (out of many) old Maori relations I possess respecting the present habitat and mode of capture of greenstone. My first was written more than fifty-five years ago, and published (with other curious items) in the "Tasmanian Journal of Natural Science," vol. ii., in 1845 (my paper being dated January, 1843):—

"The wind being light, we had Tuhua, or Mayor Island, in sight. This island appears to be of volcanic origin, and abounds in pumice, obsidian, slag lava, pitchstone, and other vitreous and volcanic substances. I use the word 'appear' in consequence of a curious relation which some years ago I received from an old priest residing at Tauranga, in the Bay of Plenty. I had been inquiring of him the place where, and the manner how, they in former days obtained the green jade or axe-stone for ornaments and weapons of war. In answer to my inquiry he asserted that this stone was both a fish and a god;⁸⁸⁷ that it formerly lived at the Island of Tuhua, whither the priests (or *tohungas* = skilled men) of all the neighbouring tribes used to go to take it, which was done by diving, accompanied with several superstitious ceremonies in order to [603] appease its wrath, and to enable them to seize it without injury to themselves; but that suddenly it made the whole island, and the surrounding sea, its *cloaca maxima*, covering every place thickly with excrementitious substances, which still remain, and swam away to the Middle Island of New Zealand, where it has ever since resided, and whence they have been obliged to obtain it. I scarcely need add that those 'excrementitious substances.' comprise the different volcanic matter with which the Island of Tuhua is now covered. Perhaps after-ages may verify the tradition related by the old priest, and bring to light the *soi-disant* god in a buried stratum of axe-stone" (*l.c.*, p. 215).

887 WC: God = *atua*; better, perhaps, a demon, or supernatural or mysterious thing or personage.

My second was written by an intelligent aged Maori of Hawke's Bay several years ago, who had collected the information in answer to my inquiries; and, as it is peculiar, I shall also give the Maori verbatim, with my free English translation:—

“To Colenso: greetings. I now despatch [to you] the information respecting the *pounamu*. Te Akapikitia asserts that this thing, the *pounamu*, is really a fish. (But I say, How did it become petrified?) Better, perhaps, is the statement made by a certain man of the Ngatimaruau family, who returned from that place. His name was Hanita te Maero: but he is dead.

“Now, this is his relation: Whenever a man residing there has a great desire to go [and take *pounamu*], he first says to his wife to pound some prepared fern-roots to carry with him as food for the long journey thither [over lands with no inhabitants]. In his sleep at night he dreams, and on awaking at daylight he relates his dream. Then he says to his wife to give to him the prepared lump of beaten fern-roots; and this is then carefully wrapped up in leaves of kawakawa and kokomuka shrubs.⁸⁸⁸ He then starts on his journey, first placing a succulent shoot of tutu⁸⁸⁹ in one ear, and of kokomuka in the other ear. And he travels until he reaches Poutini;⁸⁹⁰ there is Arahua, the water in which the *pounamu*, dwells. Then at the fit time he dives, and, lo! there it is found lying. He then fastens on to it a prepared noose rope, and it is forcibly dragged out by

888 WC: *Piper excelsum* and *Veronica salicifolia*.

889 WC: *Coriaria ruscifolia*.

890 WC: An old name for the greenstone.

those waiting on the bank of the water, and it lies on the ground. Then it is carried away to the village and worked up at leisure. The pieces of greenstone that are collected, cut up, and used by Europeans are not the same kind as those found in the water, or below in the very bed or bottom of the water. These [of theirs] are very common [604] pieces, found scattered on the land in places where they have been heated and dried by the sun.

“Further, it is constantly asserted in the fabulous stories of the tribes of these parts that the greenstone is truly a fish. (But how did it become hardened—stonified?) That fish, the greenstone, is said to have come to this land from abroad [far off on the other side]. On its first coming hither it made Tuhua [island], when the dark rocky barriers of tuhua [obsidian] grinned fiercely in defiance, showing their teeth; so greenstone kept off, floating away at a distance, and not coming near the shore until it reached the open space between Whareama and Motuairaka⁸⁹¹—that is, to Takiritane. There also the teeth of those rocks showed themselves fiercely. Still floating away at a distance from land, it was finally drifted on shore at Kaikoura, where also is Poutini Arahua, the water in which lies this fish, the greenstone.

“Here is yet another relation [respecting it] by Himiona te Aka. When the men-workers of greenstone go thither, on arriving at the spot some remain on the shore [banks], and the man who has been prepared to dive goes [into the water], taking with him the end of the long rope, the other end being with the men on the bank. He dives and

891 WC: On east coast, near Castle Point.

goes right down to shell-sand [to the beds of shell-fish], to the very bottom. He looks up above, lo! the greenstone pendent over and above him. Then he casts the rope prepared with a running knot,⁸⁹² and it is secured, and then [the greenstone] is dragged out and lies on the bank of the water. It is carried off on [their] shoulders in a litter to the village, and worked up; and when finished [they] go to dispose of [their] riches. Here ends the information [I have received] concerning the greenstone."

While the general meaning of these last-written communications may be understood by the English reader, there is much that remains unknown to him, partly owing to the different idiom, but mainly to the brief mention of, or merely allusions to, Maori matters, beliefs, customs, and habits, so well known to the Maoris themselves. And it would take some considerable time and much writing fully to explain all those allusions. Not unfrequently has a Maori relation of ancient doings, especially when containing brief notices or [605] hints of superstitious ritual observances, reminded me of a beautiful torso dug out of the earth, possessing but a small part of its pristine elegance of form and expression; but when the portions that are lacking can be supplied

892 WC: The same curious, rare, and highly descriptive-term (*here-taniwha*) is used here that was used in the account given to the capture of the big and fierce mako shark (*Trans. N.Z. Inst.*, vol. xxiv., p. 448). This further tends to show their fixed belief in the greenstone being a living creature; *ika* = a fish. The same name was also invariably-given by the old Maoris to bitumen, which was only (and rarely) found in large abnormal black lumps on the sea-shore, and used by them as a prized masticatory.

from classic tale, then all (as it were) is revealed. Even the apparently trivial circumstance of the man, when setting out on his journey to obtain greenstone, ceremonially placing the two sprigs of named shrubs in his ears, has a deep meaning; besides, some such simple observance, of using sprigs and branchlets and leaves of certain herbs and shrubs, was always made use of by the *tohunga* in all the various lustrations and charms and performances connected with the laws of the *tapu*—tending to show the natural simplicity of their more recondite or sacred actions. Moreover, similar shoots or sprigs of various and named British trees were also used by the Druids in their religious ceremonies, according to the Triads; and so by the Jews under the Levitical ritual were sprigs of hyssop.

ADDENDUM.

The Maori Relation referred to above.

“E koro, e Te Koreneho, tena ra ko koe. Tenei ka tukuaatu te korero, o te pounamu. E ki ana a Te Akaipikitia: He ika ano tenei mea te pounamu. (A, he aha ra i maro ai?)

“Engari, pea, ta tetahi tangata o Ngatimaraau, i hoki mai, i reira. Ko Hanita Te Maero tona ingoa; kua mate ia.

“Ko tana korero tenei: Ka hiahia te tangata o reira, ka kii atu ki tana wahine, kia patua he aruhe hei o mona ki reira. I te po ka moe. Moe rawa iho ia, e awhiawhi ana raua ko tetahi wahine i te po, wahine pai o te poo. Oho ake te ao, ka korero, taku moe. E awhiawhi ana maua ko Mea.

“Ka kii atu ki te wahine, kia homai te pooi-aruhe. Ko nga takai o te pooi aruhe, he kawakawa, he kokomuka. Ka haere, ko te pitau tutu, ara ko te rito o te tutu, ki tetahi taringa, ko te kokomuka ki tetahi taringa. Ka haere, ka tae ki Poutini, kei reira a Arahua, te wai i takoto ai te pounamu. Ka tae, ka ruku; na, e takoto ana; ka herea te taura; ka tooia e nga mea i uta; ka takoto ki uta. Ka mauria ki te kainga, ka mahia. Ko nga pounamu e mahia nei e te pakeha, ehara i te mea no roto no te wai, no raro ranei no whakatakere rawa o te wai; kaore, no uta noa nei, no te wahi whitinga ra nei.

“E. kiia ana, e nga korero parau a nga iwi nei: He ika tonu te pounamu. (He aha ra i maro ai?) Haere mai ana taua ika nei, te pounamu, i raawahi, tae rawa mai ki Tuhua, e pakiri atu ana nga niho o te paretao o Tuhua. Haere tonu i waho, tarewa tonui waho, kaore i tata mai ki uta; tae rawa atu ki waenganui o Whareama, o Motuairaka, ara ki Takiritaane, [606] e pakiri mai ana nga niho o tena kowhatu. Tarewa haere tonu i waho, pae rawa atu ki uta, ko Kaikoura; kei reira hoki a Poutini Arahua, te wai i takoto ai te ika nei te pounamu.

“Tetahi korero ano a Himiona te Aka. Ka haere nga tangata mahi pounamu ki reira. Ka tae atu, ka noho etahi i uta; ka haere te tangata mo te ruku, ka riro ano tetahi pito o te taura i a ia, tetahi pito ki nga tangata i uta. Ka ruku, ka tatu ki te onepipii, ka titiro ake whakarunga, e! e tarewa iho ana i runga ake i a ia; katahi, ka herea taniwhatia, ka mau; ka mea, ka hutia, ka takoto ki uta; ka amohia ki te kainga, ka mahia, ka otı; ka haere i te kaitaonga. Ka mutu te korero mo te pounamu.”

“He Waiata tenei mo Poutini Arahua.—‘Ehara hoki au i te tangata kite i a Poutini i Arahua⁸⁹³ ra, ee, i te wai ra i takoto ai koe e hanga. Taria koe e ahu mai, ii, kia mataotao, ka hoki mai ai koe ki a hau.’⁸⁹⁴

“E hoa, kai te miharo ahau ki te parau o te Maori—he ika te kowhatu! He aha ra i ngawari ai te maro nei?

“Heoi ano. Ka mutu.

“Na HA. TE RANGIKAHEKE.”

**1895 Memorabilia of certain Animal Prodigies,
Native and Foreign, Ancient and Modern.**
Transactions of the New Zealand Institute 28: 87-97.
[Read before the Hawke's Bay Philosophical Institute,
12th November. 1894.]

St. George, that swinged the *dragon*, and e'er since
Sits on his horseback at mine hostess' door,
Teach us some fence!...
And make a monster of you.

SHAKSP., “K. John,” Act II., Sc. I.

I go alone,
Like to a lonely *dragon*, that his fen

893 WC: This is the third time in this memorandum that this name is so spelled, “Arahua,” but I think that Arahura is the proper term.

894 WC: An ancient ditty of great depth and meaning, often used by chiefs at their formal meetings at times of death or calamities; heard so sung by myself.

Makes fear'd, and talk'd of more than seen.

SHAKSP., "Coriol.", Act IV., Sc. I.

EARLY in the month of May, when the shooting season begins, I was residing, as usual in the autumn, at Dannevirke, in the Forty-mile Bush, and I heard the friendly warning given to "Look out!" or "Beware!" at a certain notorious lagoon, pool, or deep-water swamp, frequented by ducks, lying about three miles from Dannevirke, and not far from the bridge over the River Manawatu.

Curiosity being aroused, I made inquiry, and I found that during the shooting season of the last year (1893) a young man of Dannevirke named George Slade, out shooting, had there seen a *taniwha* (unknown watery monster), and had fired at it and wounded it. Through the kindness of the resident clergyman (Rev. E. Robertshawe) I had an interview next day with the young man, who related the whole matter very clearly, temperately, and coherently; and, briefly, it was as follows: He was out shooting, and, having fired at a duck there swimming, and killed it, his dog went into the water after it; but before the dog got up to the duck a large animal (unknown) emerged from the thickly-growing raupo (bulrushes) adjacent, and, swimming, made direct for the dog; on this the dog retreated howling, *sans* duck. Seeing this, Slade, on the high land above, fired at the strange animal, and struck its head, beyond the eye, and near the angle of its mouth. On receiving the shot the creature turned and swam back into the tall raupo, and was not again seen. Slade further said, its head was

raised, as if on a neck, a little above the water, and appeared about 18 in. long, with greyish hair or fur. He had related the occurrence at the time on his return to the township, so that it was well known and talked of. This fresh and strange relation by him brought four others to the fore, who stated that, when out riding lately in that neighbourhood, they too had seen a creature, apparently [88] swimming, in the water there, that looked in the distance like a young colt⁸⁹⁵ with its head and neck above the surface.

The place itself is isolated, surrounded by high, broken, cliffy banks that are deeply wooded, and rather difficult of access, the water having a narrow outlet into the River Manawatu.

This newly-repeated narration of that strange event of 1893, together with the simple, honest, unpretending manner in which it was told, and the knowledge the residents had of the character of the relator, made such an impression on the minds of some of my friends who heard it, that three of them (strong and determined, and used to heavy bush-travelling) arranged to visit that out-of-the-way spot the next day, the weather, too, being fine at the time. They did so, and, after much and heavy exertion, descended the cliffs, and explored pretty much of the shores and surroundings of the lagoon, but saw nothing of any strange animal, and, after extricating themselves with some difficulty, they returned late at night to Dannevirke.

895 WC: Lest this should seem strange, I mention in a note that Maori horses, half wild, are very numerous in those parts.

While we were conversing with Mr. Slade, I expressed my opinion that the animal seen by him in the water might be one of the seals of the New Zealand seas, which I had seen in former years on our sea-shores, and whose hair was also of that colour described by him; but how a marine mammal should have found its way so far inland, and particularly through and against the current of the rough and rapid waters of the notorious Manawatu Gorge (the only way of access), seemed an insurmountable obstacle. However, I offered him a good round sum for the animal, or for any pretty large portion of it. Mr. Robertshawe, also present, related the capture of one of those seals far up in the River Waikato several years ago.

In writing to Sir James Hector shortly afterwards (on other matters) I mentioned this phenomenon, and, in reply, Sir James says, "Your *taniwha* is no doubt *Stenorhynchus leptonyx*. Several years ago I heard the same tale from the same district, and on inquiry found it to be so. Ten years ago a *taniwha* was captured in a lagoon near Hamilton on the Waikato, and exhibited in a butcher's shop, and it proved to be a *Stenorhynchus*."

An instance of the capture of one of these marine animals I may mention, as it came under my own observation, and the circumstances attending its seizure were strange, if not unique. It happened early in the forties. I was then residing at Waitangi, on the immediate southern shore of Hawke's [89] Bay, and close by the Maori pa (village) Awapuni. One morning there was a great outcry, and a big movement of a body of natives from the village on to the beach. I went thither to see what was the matter, and I found they had captured a large greyish-blue hairy seal,

and this in a peculiar way. Some children were playing on the beach, and they saw at a little distance what they supposed to be a woman asleep on the warm and dry shingle, a short distance above high-water mark. By-and-by they went towards her, when they soon found out their mistake, and immediately raised a cry, not knowing what it was. The chief, Karaitiana,⁸⁹⁶ who happened to be walking on the beach not far off, ran up and saw the big seal; and now the creature, alarmed, was scuttling away fast towards the sea. Karaitiana had nothing in his hands with which to bar its progress, while the animal, turning its head from side to side, snapped its jaws fiercely; so he threw himself down flat on the beach and grasped the seal with his two hands just above the tail and held on firmly, and, being a tall and stout man, the seal could not draw him along the beach, but in its exertions threw up stones and gravel with its flippers, and knocked Karaitiana about pretty considerably. In a little while, however, other Maoris came running up to the spot armed with axes, hatchets, and clubs, and soon put an end to the struggle, carrying off the seal in triumph to their village; and some time after, while the earth-ovens were being prepared for cooking the animal, I was astonished at seeing its jaws open and snap loudly several times, although its skull had been broken into with axes and brains protruding, the head not yet being severed from the body. I was also struck with the appearance of its large and formidable 3-cuspidate molar teeth in both jaws, which also regularly locked into each other. I

896 WC: Karaitiana, in after years, became an elected Maori member of the House of Representatives.

obtained the head as my perquisite, and buried it in my garden *pro tem* as a step towards preserving the bones; but long after, when I frequently sought it, after submerging floods, I never could find it.

On several occasions I have had the dried skins of these animals (taken on the outer coast, as at Waimarama, near Cape Kidnappers, and further south) brought to me for sale, but, not having any use for them, I only purchased one. They were all nearly alike in general appearance as to size, hairiness, and colour of their hair, quite dry and hard, having been carefully flayed from the animal, and stretched out and dried on a hollow frame of sticks, according to the ancient Maori manner of drying their dog and other skins. Of course, they were all captured by the Maoris when on shore. [90]

As seals are known by us to be of gregarious habits, a peculiar proverbial saying of the ancient Maoris respecting these animals may be fitly adduced here as showing their also having had some knowledge of that kind: “*No, to tamahine kapai i takina mai ai tenei kekeno ki konei*” = “It was thy exceedingly pretty and willing daughter which drew this seal to land here.” “This speaks for itself, and would be doubly suitable for such a chief to say coming by *sea*—along the coast; in the olden times nearly all peaceful visits were made by water.” “N.B.—The verb *taki* (pass. *takina*), here used, means to forcibly draw a captured fish to land out of the water.”⁸⁹⁷

897 WC: *Trans. N.Z. Inst.*, vol. xii, p. 144.: “Maori Proverbs,” No. 207.

To return to the *taniwha*, or *ngarara* (water-monster), or crocodile and dragon: During my long residence in this country (now considerably more than half a century) I have repeatedly heard from old Maoris of somewhat similar, though much more marvellous, occurrences; I have also been shown the lairs and “bones” (*calcite*), and the remains and signs of the wonderful doings of such monstrous creatures = *ngataniwha* (in the big slips of earth from the hill- and mountain-sides, caused by their sudden throes and emergence from beneath or within the solid earth); but of the creatures themselves I have found nothing, not even the slightest remains.

And here, I think, I may properly call your attention to those transcendent Maori stories and legends of the olden time, in which the taking and destroying of several huge and hideous animals of the reptilian class and of the saurian (or crocodile) order by some of their valorous and skilful ancestors is graphically and clearly related. To them I would refer you, my audience, this night; I have faithfully translated them, and you will find them recorded in the Transactions of our Institute⁸⁹⁸ and I assure you they are well worthy your perusal, and in reading them it should ever be borne in mind that the Maoris firmly believed in their truth; hence, too, it was that they did not care to venture into strange, unfrequented places, from fear of those immense *ngarara* infesting them: this is nicely shown by Dieffenbach, in his quaint relation of the opposition made by the Maoris

898 WC: Vol. xi., pp. 82–100.

against his ascending Mount Egmont, lest he should be destroyed by the *ngararas*.⁸⁹⁹

But, while those ancient Maori stories partake so very largely of the marvellous, and are also mere relations, orally handed down from generation to generation—

Till their own tales at length deceive ‘em,
And oft repeating they believe ‘em.⁹⁰⁰ [91]

—obscured in the night or twilight of the dim past there are similar and well-authenticated European narrations contained in written history. Some of them, being but little known, I purpose bringing to your notice this evening.

My first is from ancient Roman history, originally recorded by the able Latin historian Livy (though that portion of his works containing it has long been lost), and is thus related by Valerius Maximus from Livy, by whom it is said to have been recorded at greater length. It is the account of that enormous reptile which spread dismay even through a powerful and disciplined Roman army. Valerius says,—

“We may here mention the serpent so eloquently and accurately recorded by Livy, who says that near the River Bagrada, in Africa, a snake was seen of so enormous a magnitude as to prevent the army of Attilius Regulus from the use of the river; and, after snatching up several soldiers with its enormous mouth and devouring them, and killing several more by striking and squeezing them

899 WC: Dieffenbach’s “New Zealand,” vol. i., p. 140.

900 WC: Prior.

by the spine of its tail, was at length destroyed by assailing it with all the force of military engines and showers of stones, after it had withstood the attack of their spears and darts; that it was regarded by the whole army as a more formidable enemy than even Carthage itself; and that, the whole adjacent region being tainted with the pestilential effluvia proceeding from its remains, and the waters with its blood, the Roman army was obliged to move its station. He also adds that the skin of the monster, measuring 120 ft. in length, was sent to Rome as a trophy." Pliny also relates this story, saying, "It is a well-known fact that during the Punic war, at the River Bagrada, a serpent 120 ft. in length was taken by the Roman army under Regulus, being besieged, like a fortress, by means of balistæ and other engines of war. Its skin and jaws were preserved in a temple at Rome down to the time of the Numantine war."⁹⁰¹ That wonderful encounter took place B.C. 256.

My second narration is a much more modern one, though happening five hundred years ago. It is well and fully authenticated, and, I think, very interesting, particularly as several of its prominent features are curiously in close accord with the Maori tales; and, as I have only met with it in a valuable and scarce old folio of the last century, I have made a copious extract of it, deeming it worthy to be brought before you. [92]

901 WC: Pliny, "*Nat. Hist.*," *lib. viii.*, c. 14. This astonishing event is also referred to by many ancient writers; among others, by Florus (*lib. ii.*, c. 2); Aulus Gellius (*lib. vi.*, c. 3); and Val. Maximus (*supra*), (*lib. i.*, c. 8).

In the “History of the Knights of Malta,” by the Abbé Vertot, is the following relation: “In 1340 A.D. the Grand Master of the Order, Helion de Villeneuve, from charity and prudential motives, forbade all the knights, on pain of degradation, to offer to fight a serpent or crocodile. This crocodile was of monstrous size, did a vast deal of mischief in the Island of Rhodes, and had even devoured some of the inhabitants. For the better understanding so extraordinary an incident, we shall barely relate what history says on the subject.

“The haunt of this furious animal was in a cavern on the edge of a marsh at the foot of Mount St. Stephen, two miles from the city. He went often out to seek his prey. He ate sheep, cows, and sometimes horses when they came near the water and edge of the marsh; the inhabitants complained, likewise, that he had devoured some young shepherds that were keeping their flocks. Several of the bravest knights of the convent, at different times, and unknown to each other, went singly out of the city to endeavour to kill him, but none of them ever came back. As the use of firearms was not then invented, and the skin of this kind of monster was covered with scales that were proof against the keenest arrows and darts, the arms, if we may so say, were not equal, and the serpent soon despatched them. This was the motive which engaged the Grand Master to forbid the knights attempting any more an enterprise that seemed above human strength.

“They all obeyed him except one knight, of the language of Provence, named Dieu-donné de Gozon, who, in breach of this prohibition, and without being daunted at

the fate of his brother companions, formed secretly the design of fighting this voracious beast, resolving to perish in it or deliver the Isle of Rhodes. This resolution is generally ascribed to the intrepid courage of the knight, though others pretend that he was likewise pushed on to it by the stinging invectives with which his courage had been insulted at Rhodes, because, having gone several times out of the city to fight the serpent, he had contented himself with taking a view of it at a distance, and had thereby employed his prudence more than his valour.

“Whatever were the motives that determined the knight to try this adventure, he, to begin the execution of his project, went into France and retired to the castle of Gozon, which is still standing, in the Province of Languedoc. Having observed that the serpent had no scales under the belly, he formed the plan of his enterprise upon that observation.

“He caused a figure of this monstrous beast to be made in wood or pasteboard, according to the idea he had preserved of it, and took particular care to imitate the colour of it. He [93] afterwards taught two young bulldogs to run when he cried out and throw themselves under the belly of that terrible creature, whilst he himself, mounted on horseback, clad in armour, with his lance in his hand, pretended at the same time to strike at it in several places. The knight spent several months using this exercise every day, and as soon as he found his dogs perfect in this way of fighting he returned to Rhodes. He was scarce arrived in the island when, without communicating his design to anybody whatsoever, he made his arms be carried privately near a church situated

on the top of the mountain of St. Stephen, where he came attended by only two servants, whom he had brought from France. He went into the church, and, after recommending himself to God, took his arms, mounted on horseback, and ordered his servants, if he perished in the combat, to return to France, but to come up to him if they perceived he had either killed the serpent or was wounded himself. He then went down the mountain with his two dogs, advanced straight to the marsh and the haunt of the serpent, who, at the noise that he made, ran with open mouth and eyes darting fire to devour him. Gozon gave it a stroke with his lance, which the thickness and hardness of its scales made of no effect. He was preparing to redouble his stroke, but his horse, frightened with the hissing and smell of the serpent, refuses to advance, retires back, and leaps aside, and would have been the occasion of his master's destruction if he, with great presence of mind, had not thrown himself off; and then, taking his sword in hand, and attended by his two faithful dogs, he immediately comes up to the horrible beast, and gives him several strokes in different places, but the hardness of the scales hindered them from entering. The furious animal, with a stroke of his tail, threw him on the ground, and would infallibly have devoured him if his two dogs, according as they had been taught, had not seized the serpent by the belly, which they tore and mangled with their teeth, without his being able, though he struggled with all his strength, to force them to quit their hold. The knight, by the help of this succour, gets up, and, joining his two dogs, thrust his sword up to the hilt in a place that was not defended by scales; he there made a large wound, from whence a

deluge of blood flowed out. The monster, wounded to death, falls upon the knight and beats him down a second time, and would have stifled him by the prodigious weight and bulk of its body if the two servants, who had been spectators of the combat, had not, seeing the serpent dead, run in to the relief of their master. They found him in a swoon and thought him dead, but when they had with great difficulty drawn him from under the serpent to give him room to breathe, in case he was alive, they took off [94] his helmet, and, after throwing a little water upon his face, he at last opened his eyes. The first spectacle, and the most agreeable one that could offer itself to his sight, was that of seeing his enemy slain, which was attended with the satisfaction of having succeeded in so difficult an enterprise, in which many of his brother companions had lost their lives.

"No sooner was the fame of his victory and the serpent's death proclaimed in the city but a crowd of inhabitants thronged out to meet him. The knights conducted him in triumph to the Grand Master's palace; but in the midst of their acclamations the conqueror was infinitely surprised when the Grand Master, looking on him with indignation, demanded of him if he did not know the orders he had given against attacking that dangerous beast, and if he thought they might be violated with impunity. Immediately this strict observer of discipline, without vouchsafing to hear him, or being moved in the least by the intercession of the knights, sent him directly to prison. He next convened the Council, where he represented that the Order could by no means dispense with inflicting a rigorous punishment on so notorious a disobedience, that was more prejudicial to discipline than

the life of several serpents would have been to the cattle and inhabitants of that quarter of the island; and, like another Manlius, he declared his opinion was that that victory should be made fatal to the conqueror. But the Council prevailed that he should be only deprived of the habit of the Order: in short, the unfortunate knight was ignominiously degraded, and there was but a short interval between his victory and this kind of punishment, which he found more cruel and severe than death itself.

“But the Grand Master, after having by this chastisement performed the obligations due to the preservation of discipline, returned to his natural temper, which was full of sweetness and good-nature. He was pleased to be pacified, and managed things in such a manner as to make them entreat him to grant a pardon, which he would have solicited himself if he had not been at the head of the Order. At the pressing instances made him by the principal commanders, he restored him to the habit and his favour, and loaded him with kindnesses. All this was not to be compared to the unfeigned praises of the people, who dispose absolutely of glory, whilst princes, how potent soever they may be, can only have the disposal of the honours and dignities of the State.

“They set up the head of this serpent or crocodile over one of the gates of the city, as a monument of Gozon’s victory. Thevenot, in the relation of his travels, says that it was there in his time—or, at least, the effigies of it; that he himself had seen it there; that it was much bigger and [95] larger than that of a horse, its mouth reaching from ear to ear; big teeth, large eyes, the holes of the nostrils

round, and the skin of a whitish-grey—occasioned perhaps by the dust which it gathered in course of time.”

Vertot goes on to remark, “We shall be less surprised at so extraordinary an incident if we reflect that the Isle of Rhodes was anciently called Ophiusa, from the Greek word ὄφις, which signifies a serpent, from the great number of those reptiles that infested that island.

Hyginus, a Greek historian, relates, upon the testimony of Polyzelus, a Rhodian, that a Thessalian, son of Triopas, or of Lapithas according to Diodorus Siculus, having been thrown by a storm on the coast of Rhodes, happily exterminated those mischievous animals; that Phorbas, among the rest, killed one of them of a prodigious bigness, which devoured the inhabitants. The learned Bochart pretends that the Phœnicians called the island by the name of Gesirath-Rod—*i.e.*, “the isle of serpents”—Gesirath, according to that author, being a term common to the Phœnicians, Syrians, Arabians, and Chaldeans for signifying an island, and Rod, in the Phœnician tongue, signifying a serpent; so that, joining these two words together, they formed that of Gesirath-Rod, whence the Greeks afterwards made that of Rhodes, which the isle has preserved to this day.”

Then Vertot goes on to relate “a like event which happened in Africa, while Atilius Regulus commanded the Roman army there” (given more briefly by me above); and then he remarks, “I do not maintain that there has been no exaggeration in the length of the African serpent, nor assert everything that is told of the monstrous bulk of the crocodile of Rhodes; but what appears certain from the historians of that time, from

tradition, and even from inscriptions and from authentic monuments, is that Gozon killed a terrible animal, and by that means acquired a great reputation, especially with the people of Rhodes, who looked upon him as their deliverer.

"The Grand Master, to make him some amends for the mortification he had given him, conferred rich commandries upon him. He took him afterwards to be near his person, and, finding a prudence in him equal to his bravery, he made him at last his lieutenant-general in the government of the island."

About the year 1346 the Grand Master Helion de Villeneuve died, and the knights met in solemn conclave to elect his successor; and our author states, "The Commander de Gozon was one of the electors. When it came to his turn to give his voice he said, 'When I entered this conclave I made a solemn oath that I would not propose any one but such a knight as I should judge most deserving of this great dignity, [96] and to have the best intentions for the general good of the whole Order; and, after having seriously considered the matter,...I declare that I find nobody better qualified for the government of our Order than myself.' He then made a fine harangue upon his own virtues; the fight against the serpent was not forgotten, but he insisted chiefly on his conduct from the time that the Grand Master Villeneuve had made him his lieutenant"; and in the end he was elected to that high dignity, and, the historian adds, "he was solemnly acknowledged as Great Master to the satisfaction of the convent, and especially of the citizens of the Town of Rhodes and the inhabitants of the island,

who, since his victory over the serpent, looked upon him as the hero of the Order.”

There are several pages in this work showing how well he presided and wrought. He died suddenly in December, 1353; on which Vertot says, “If that term ‘sudden’ may be allowed with regard to so good a man, who had always been more watchful over his own conduct than over that of the knights under his care. His funeral was celebrated with the just eulogiums of his brother knights, and the tears of all the inhabitants of the isle, and of the poor especially, to whom he was indeed a father. All the inscription put on his tomb was this: ‘Here lies the Vanquisher of the Dragon.’” (*L.c.*, vol. i., pp. 249–263.)

While engaged in writing this paper I have thought that, on hearing this clearly-written and plain statement concerning the knight Gozon and the dragon, two main thoughts or ideas were likely to arise within your minds—one, the great similarity in several circumstances between this narration and those ancient Maori stories concerning the slaying of monstrous dragons or crocodiles; and the other, the likeness and suitability of much of the relation to illustrate the old English story of “St. George and the Dragon.” This tale of the patron saint of England is, perhaps, just as truthful as those Maori recitals; for it has baffled all antiquarian research—I mean with reference to his terrible fight with the monster, with which (it is just barely possible) Gozon’s combat with the dragon may have had something to do by way of embellishment, as the date of the fight was during the time of the Crusades, in which, of course, the knights of Malta were largely occupied. Moreover, we are told in

history how St. George came to be the patron saint of England; which I may also briefly state, as it is a kind of evidence in support of my notion just mentioned:—

“When Robert, Duke of Normandy, son to William the Conqueror, was prosecuting his victories against the Turks, and laying siege to the famous City of Antioch, which was like to be relieved by a mighty army of the Saracens, [97] St. George appeared with an innumerable army coming down from the hills all in white, with a red cross in his banner, to reinforce the Christians, which occasioned the infidel army to fly, and the Christians to possess themselves of the town. This story made St. George extraordinarily famous in those times, and to be esteemed a patron, not only of the English, but of Christianity itself.”⁹⁰² Be that as it may, we of to-day are better acquainted with the well-executed effigies of St. George and the Dragon which adorn our modern British coins of crowns and sovereigns, which realities are tangible, valuable, and desirable, whatever the origin of the marvellous fight may be.

[NOTE.—The peculiar spelling, &c., are due to the age of the work whence quotations made—the middle of the eighteenth century.]

902 WC: Wheatly “*On the Common Prayer*,” p. 61; who also says, “St. George, the famous patron of the English nation, was born in Cappadocia, and suffered for the sake of his religion, A.D. 290, under the Emperor Diocletian (in whose army he had before been a colonel), being supposed to have been the person that pulled down the edict against the Christians which Diocletian had caused to be affixed upon the church doors. Subsequently he had a church dedicated to him by Justinian the Emperor.”

**1895 Phænogams: A Description of a few more
Newly-discovered Indigenous Plants; being a
Further Contribution towards the making
known the Botany of New Zealand.
Transactions of the New Zealand Institute 28: 591-
613.**

[Read before the Hawke's Bay Philosophical Institute,
21st October, 1895.]

Class I. DICOTYLEDONS.

Order I. RANUNCULACEÆ

Genus 3.⁹⁰³ Ranunculus, Linn.

1. *R. rufus*,⁹⁰⁴ sp. nov.

Plant perennial, large, stout, everywhere hairy; hairs long, shaggy, flattish, acute, dull-red. Leaves broadly orbicular, $3\frac{1}{2}$ in. long, 5 in. wide, reddish-green, chartaceous; margins crenate, teeth broad rounded, base truncate and cordate, hairs strigosely situated; strongly primary-veined from petiole to margins, with secondary veins forming large areolæ of irregular shapes and sizes, usually 5-6 sided, with free branched veinlets within them (compound anastomosing); hairs forming a thickened elevated margin to leaves; petioles stout, [592] 4 in. long. Flowering-stem 15 in. high (perhaps more,

903 WC: The numbers of the orders and genera given here are those of them in the "Handbook of the New Zealand Flora."

904 *Ranunculus insignis* Hook.f.

specimens not having basal extremity), erect, very stout, $\frac{1}{2}$ in. diameter, naked; 9 in. to first caudine leaf, thence 2–3 stout bibracteate stems, sub 4 in. long; bracts $1\frac{3}{4}$ in. long, narrow, sessile, and clasping; each stem bearing 3–5 flowers, on pedicels 2 in. long, also bibracteate; bracts long, narrow, alternate, sometimes opposite; the lower and main caudine leaf large, orbicular (deeply trifid in one specimen), $2\frac{1}{2}$ in. diameter; petiole short, broad, and stout; hairs retrorse. Flowers large, spreading, forming sub-corymbs, 12–14 and more on one scape. Sepals 4, elliptic, $\frac{1}{2}$ in. long, thin, margins very membranous, longitudinally hairy along middle on outside, and very hairy and ciliate at tips. Corolla, petals 4, broadly cuneate, $\frac{3}{4}$ in. long, $\frac{1}{2}$ in. wide at top, tips flat-rounded, bright-yellow, shining, veined; base of petals narrow, thickened; nectary small, close to base, foveolate, with a semicircular ridge below; the 3 primary veins from base largely dichotomous, and running subparallel to tip. Stamens very numerous, $\frac{1}{4}$ in. long, flat, 1-nerved; anthers 1 line long. narrow, elliptic, with membranous margins. Carpels many, closely packed, forming ovoid heads (immature), $\frac{1}{2}$ in. long, hairy, with long hairy tails, their upper portion having a flattish submembranous margin, tips acute, glabrous.

Hab. Ruahine Mountain-range, east side: *Mr. H. Hill*, 1894; *Mr. E. W. Andrews*, 1895.

Obs. This fine plant has close affinity with three other known species from the same alpine locality—viz., *R. insignis*, Hook.; *R. ruahinicus*, Col. (Trans. N.Z. Inst., vol. xviii., p. 256); and *R. sychnopetala*, Col. (Trans. N.Z. Inst., vol. xviii., p. 324, and vol. xxvi., p. 313)—but

differing from them all in several characters, and particularly in its peculiar and striking shaggy carpels.

Order VII. PORTULACEÆ.

Genus 1. Claytonia, Linn.

1. *C. calycina*,⁹⁰⁵ sp. nov.

A small perennial low creeping herb, subsucculent, glabrous, rooting at nodes. Stems stout (for plant), branchlet short, about $\frac{1}{2}$ in. apart on main stem. Leaves linear, $\frac{3}{4}$ in. long, $\frac{1}{2}$ line wide, tips obtuse, thickish, in fascicles of 4–5, stipulate. Flowers terminal on branchlets, 2–3 together; pedicels of various lengths, $\frac{3}{4}$ in.–1 in. long. Calyx 2 large persistent broad sepals, half as long as corolla, concave, much imbricate in bud and in flower, tips rounded. Corolla white, 4 lines diameter, lobes obovate, obtuse, incurved, veined. Stamens whiter spreading; anthers oblong, red; style half as long as stamens; stigmas 2, erect, linear, acuminate, pointed, minutely pubescent. [593]

Hab. Ruahine Mountain-range: *Mr. A. Olsen*; 1895.

Obs. This species is near the only other known southern one (*C. australasica*), but differs in its scape being 2–3 flowered, in its very much larger calyx (a striking character), different-shaped anthers, and bifid instead of trifid stigma. Of *C. australasica* Hooker says, in first describing it ("Icones Plantarum," tab. 293), "petalis calycem quadruplo superantibus" — which his plate, with dissections, clearly show; and Bentham, "sepals

905 *Montia calycina* (Colenso) Pax & K. Hoffm.

small orbicular, petals several times longer; style 3-cleft," &c. ("Fl. Australiensis," vol. i., p. 177).

Order XXVI. DROSERACEÆ.

Genus 1. *Drosera*, Linn.

1. *D. ruahinensis*,⁹⁰⁶ sp. nov.

Plant perennial, tufted, erect, sub 2 in. high, glabrous; rootstock long and straight, woody, much fibrously branched; the whole plant very dark coloured (blackish) when dry. Leaves with petioles 1½ in. long, of two forms, ovate-acuminate, and broadly orbicular-spathulate, lamina of the latter very glandular on upper surface; glands long, flat, flexuous, and straight, dark-red, broadest at base, tips subobovoid; petioles sub 1¼ in. long, broad, membranous, veined, half-clasping. Scape ¼ in.–½ in. longer than leaves, filiform, naked. Flower solitary, small, 3 lines long; calyx lobes broadly-elliptic-oblong, tips slightly jagged. Corolla a little longer than calyx; petals membranous, suborbicular, entire, whitish tinged with rose-colour, veined. Stamens flat, broad, shorter than calyx, included; anthers cordate, yellow. Styles 3, short, stout; stigmas capitate, large, papillose; ovary sub-ellipsoid-globular.

Hab. Ruahine Mountain-range: *Mr. H. Hill*, 1895; *Mr. A. Olsen*, 1895.

906 *Drosera arcturi* Hook.

Obs. A species having affinity with *D. arcturi*, Hook., and *D. polyneura*, Col. (Trans. N.Z. Inst., vol. xxii., p. 460), but differing from both in several grave characters.

2. *D. stylosa*,⁹⁰⁷ sp. nov.

Plant slender, weak, suberect; stem 10 in.–12 in. high, dark-green, almost black (so also stem-leaves and -sepals), striate, slightly branched, 1–2 small branches near top, each bearing 2–3 leaves and a single terminal flower. Leaves rosulate, 9–10, broadly orbicular, 2 lines wide, glandular on upper surface and at margins (glands in centre of lamina very short and small), glabrous below, pale yellow-brown; petioles flat, stout, $\frac{1}{2}$ in. long. Stem-leaves broadly lunate and peltate, 2 lines wide, much glandular on upper surface; glands flattish, long (irregular lengths), strong, spreading, those of the two [594] angles very long, stout, and branched (three leaves together erect at base), scattered alternately throughout stem, 6–8 lines apart, the lower solitary, afterwards 2 together, then 3–4 subfascicled; petioles filiform, 7–8 lines long. Raceme at top 1½ in.–2 in. long with a few (5–7) distant flowers, having a single small linear toothed acuminate adpressed bract between them; pedicels finely filiform, 2–3 lines long. Sepals broadly oblong, 2 lines long, membranaceous, veined, glabrous, roughish, minutely tuberculate; tips much jagged. Corolla very membranous, twice length of sepals; petals broadly cuneate, pink, veined; styles 3, stout, spreading, much branched at top; branches flattish, with numerous minute

907 *Drosera auriculata* Planch.

terminal and marginal globular dots. Anthers very small, suborbicular, white; stamens dark-coloured. Ovary elliptic-globose, dark-green. Seeds linear, acuminate, somewhat falcate, brownish.

Hab. Ruahine Mountain-range, east side: *Mr. H. Hill*; 1895.

Obs. A species very near to *D. auriculata*, Backhouse, but differing in its branched stem (in number and position of stem-leaves), in bracteolate raceme, in broad laciniate sepals, and in its very peculiar styles, these last being a most interesting and curious object under the microscope.

Order XXXVIII. RUBIACEÆ.

Genus 1. *Coprosma*, Forst.

1. *C. margarita*,⁹⁰⁸ sp. nov.

A small low shrub; bark dark-coloured, purplish; branches very slender, erect, and drooping when in fruit (specimens 6 in.–8 in. long); branchlets numerous, rather close, opposite, short, filiform, somewhat angular, thickly clothed with short greyish hairs, strigosely pubescent. Leaves few, more numerous at tips of branchlets, linear, 9 lines long, $\frac{1}{16}$ in. wide, glabrous, green, acute and subacute, slightly falcate, recurved, tips callous, tapering at base; petioles very short, purple. Stipules small, deltoid-acuminate, acute, pilose, ciliolate. Flowers: *male* not seen; *female* solitary, terminal on very short branchlets and often opposite, sometimes having a pair of

908 Possibly *Coprosma microcarpa* Hook.f.

linear leaf-like bracteoles at base, purple-margined, their tips minutely ciliolate, as also are the teeth of the calyx, which are very small; peduncles slender, wiry, 1 line long. Corolla small, infundibuliform, $\frac{1}{8}$ in. long, pale-yellow irregularly spotted with purple, 4-lobed; lobes subovate and sub-acute, spreading, margins purple; styles twice as long as tube, stout, very pubescent, obtuse, spreading. Fruits numerous, globular, $\frac{1}{10}$ in. diameter, white, shining, semitransparent, crowned with the minute calycine lobes. Seeds 2, suborbicular, plano-convex, $\frac{1}{12}$ in. diameter, whitish. [595]

Hab. Ruahine Mountain-range, east side: *Mr. A. Olsen*, 1895.

Obs. A very distinct species of this rather difficult genus, and very handsome when in fruit; its little solitary, globose, white, shining fruits resembling pearls strung on its light feathery foliage (whence its specific name). At this season its appearance is most striking, further increased by the graceful drooping of its slender loaded branches. I regret not having seen its male flowers; indeed, my female specimens —in fruit and in early flower—are the result of two visits made during two seasons, autumn and spring, to the mountains.

Genus 2. *Nertera*, Banks and Solander.

1. *N. montana*,⁹⁰⁹ sp. nov.

A small low creeping succulent glabrous herb, rooting at nodes, 1 in.—3 in. high, branches numerous and very short. Leaves suborbicular, broader than long, apiculate,

909 *Nertera granadensis* (Mutis. ex L.f.) Druce.

1–2 lines diameter, concave, tapering, a few rather long weak white ciliæ at margins; these are flat, semitransparent, and jointed; petioles 1 line long. Flowers small, terminal on short branchlets, sessile, pale-greenish. Corolla, tube shorter than limb; lobes deltoid, subacute, spreading, subhyaline, pubescent within. Stamens spreading longer than styles; anthers exserted, suborbicular and cordate, yellow; styles 2, spreading, recurved. Ovary broadly ovoid, glabrous.

Hab. Ruahine Mountain-range, east side : *Mr. A. Olsen*; January, 1895.

2. *N. papillosa*,⁹¹⁰ sp. nov.

A minute low creeping herb, 3 in.–4 in. long, rooting at nodes, much branched; branches very short; subsucculent, glabrous, finely papillose; stems purple-splashed. Leaves very small, scarcely 1½ lines long, suborbicular-deltoid, tip subacute, pale-green with purple margins, stippled below; petioles as long as leaves.

Flowers terminal, very small, sessile; corolla 1 line in diameter, greenish-yellow, 4-parted; lobes deltoid, acute, finely pubescent within; stamens 4, longer than lobes; anthers orbicular, yellow; stigmas 2, recurved, shorter than anthers; ovary oblong. Fruit globular, glabrous, shining, sessile, $\frac{1}{10}$ in. diameter, red. Seeds 2, oblong-ovoid, $\frac{1}{20}$ in. long, plano-convex, greyish-white.

Hab. Low wet spots on the sides of the mountain Tongariro, in the Taupo district: *Mr. H. Hill*; 1893.

910 *Stet.*

Obs. This is an interesting little plant—a perfect gem—in its lustrous, lowly, humble beauty. I have succeeded in growing it, and therefore have been able to watch its minute development, and to note all its grave characters in its fresh [596] state, in confirmation of dried specimens brought away by Mr. Hill.

Order XXXIX. COMPOSITÆ.

Genus I. Olearia, Mœnch.

1. *O. consimilis*,⁹¹¹ sp. nov.

A bushy shrub, 5 ft.—6 ft. high, with long slender branches; bark dark-brown, striate. Branches numerous, erect, straight and drooping, opposite, angled, ribbed; bark reddish-brown, bright, shining on the younger branchlets, with more or less of orange-coloured dry waxy exudation, which is also scattered on leaves (beneath), and peduncles. Leaves numerous, regularly distant on branchlets, 6—9 lines apart, fascicled, 5—7 together on the lower and 3 on the upper part of branchlets, opposite, but on flowering branchlets the terminal portion above the flowers has only single leaves opposite, erect, spreading linear or sub-linear-spathulate, 2 lines long, $\frac{1}{20}$ in. wide, thickish, tip broadly rounded, base slightly tapering, sessile, margins entire subrevolute, dark-green and slightly scaberulous above with midrib deeply sunk, the same slightly prominent and orange-coloured below, with close whitish shining hairs. Heads many, solitary, axillary, regularly opposite (in pairs) on

911 *Olearia solandri* (Hook.f.) Hook.f.

lateral branchlets, 2–3 lines apart, subcampanulate, 4 lines long, 1½ lines diameter; peduncles 1 line long. Involucral scales many, imbricate in 4 rows, yellow, shining, with a green central stipe in their apical portion, the outer broadly ovate and short, the middle narrow ovate acuminate, the innermost longest 2½ lines long, very narrow linear-lanceolate, with thin undulating shining margins, coarsely ciliate-jagged. Florets few (11), as long as pappus, slender, red-brown (dry); style-arms very long recurved brown roughish lanceolate, tips acuminate, acute. Pappus nearly equal, white, shining, slightly scabrid, tips acute. Achene linear-flattish, striate, glabrous, shining.

Hab. Norsewood, County of Waipawa—margins of woods and streamlets: *Mr. A. Olsen*; 1895. (Flowering in autumn.)

Obs. A species very near to *O. fasciculata*, Col. (Trans. N.Z. Inst., vol. xxv., p. 330), but differing from that species in fewer rows of involucral scales, of a different colour, and free from waxy exudations, &c.

2. *O. quinquefida*,⁹¹² sp. nov.

A shrub “7 ft.–8 ft. high,” of upright growth; branches long, slender; bark darkish-brown, striate, with minute whitish membranaceous scurf; branchlets very slender and straight, erect, bark red-brown, glabrous, shining, with slightly scattered red scaly exudation, angled, a prominent ridge decurrent from base of pair of leaves above to the next pair below. Leaves [597] numerous, decussate, sub-linear-spathulate, 2–2½ lines long,

912 *Olearia solandri* (Hook.f.) Hook.f.

scarcely $\frac{1}{2}$ line broad, erect, opposite and sub-fascicled 3–4–5 together, the bases of the outer pair semiclasping and meeting around the stem, margins entire, revolute, green glabrous and slightly scurfy above, densely hairy below; hairs whitish-grey, coarse and dull; petioles short, stout, those of the outermost pair of leaves thickened at bases. Flowers numerous, heads narrow, campanulate, 2 lines long, solitary, sometimes 2 (rarely 3) together, opposite, 4–6 lines apart on branch, regular and extending nearly throughout long branches, and on very short lateral branchlets, axillary, sessile, surrounded by leaves. Involucral scales in 7–8 rows, broadly ovate-obtuse, closely imbricate, bright-yellowy, glabrous, their centres pale with closely appressed hairs, and a line at apex, the outermost very small increasing in size upwards, the innermost 2–2½ lines long, thin, brownish and shining within and largely reverted at maturity, their margins rumpled and slightly jagged. Florets very few, slender, as long as pappus; *disk*, lamina deeply cut into 4–5 linear lobes, their margins thickened and dark-coloured, tips acute hairy; style longer than corolla, arms filiform very long, rough, jagged, tips obtuse but not truncate; *ray*, lamina very narrow, revolute, 3-nerved, tip 3-toothed; style-arms shorter than lamina. Pappus numerous; patent, spreading, slightly scaberulous, tips acute, whitish with a pale reddish-brown hue. Achenes small, glabrous, pale, subangular, slightly striate, thickened at top.

Hab. Hilly country near Lake Tutira, County of Wairoa, Hawke's Bay : Mr. Guthrie-Smith; 1895.

Obs. A species much resembling and having close affinity with the preceding one, *O. consimilis*, but differing in involucral scales; in the many-lobed lamina of its disk-florets, with their peculiar-coloured margins; in its very long style-arms; and in its spreading, reverted, shining, brown involucres after flowering, that give it a curious appearance.

3. *O. aggregata*,⁹¹³ sp. nov.

A thickly-branched shrub, 5 ft.–6 ft. high; branchlets 1 ft. or more long, very slender, simple, rarely forked, subangular; bark dark-red-brown, glabrous, much coarsely striate. Leaves few, distant, opposite, fascicled 6–8 together, forming very small lateral branchlets, oblong-lanceolate, 3–5 lines long, 1½ lines wide, not thick, petiolate, margins entire and slightly recurved; tips subacute, dark-green and glabrous above, densely pubescent below; hairs appressed, white shining with a reddish tint, flat, lanceolate, acute, centrally fixed; midrib showing full-length beneath, its hairs also being darker; petiole 1 line long, hairy; hairs reddish, glossy, and so the [598] young leaves. Flowers numerous, opposite, fascicled : (1) On main branches regularly distant, ¾ in. apart, and terminal on very short lateral branchlets (or spurs), 4–6 together among leaves; (2) on branchlets much closer, 4–5-fascicled, covering branchlets. Heads small, campanulate, ¼ in. long; peduncle 1 line long, hairy, bibracteate. Involucral scales oblong, very hairy especially on margins and tips, few in 3 rows, the outer smallest, middle broadest with a dark central line, inner

913 Possibly *Olearia virgata* Hook.f.

longest and narrowest and more membranous. Florets few; of *ray* 6, lamina 4-nerved, tip truncate, 3-toothed; style very short, as long as tube, arms short, obtuse; of *disk* 5, tips of their lobes ciliolate. Pappus few, erect, white, much shorter than florets, densely scabrid, tips subacute. Achene small linear angular thickened upwards, dull-brown, glabrous.

Hab. In the Weber district, County of Patangata, between Dannevirke and the East Coast : *Mr. H. Hill*; November, 1895.

Obs. A truly handsome shrub, from the great regularity of its numerous and neat symmetrical heads of flowers in small knots or bunches on its slender branches. This species belongs naturally to the same sub-section as the two former ones, but is very distinct.

4. *O. parvifolia*,⁹¹⁴ sp. nov.

A small bushy shrub of diffuse growth, 6 ft.–8 ft. high, with erect twiggy branches; branchlets slender, glabrous, angular, dark-red, striate. Leaves and flowers produced together in small knots or bunches, 5–7 lines apart, opposite; leaves few, 3–4–6 together fascicled, very small, 1½–2½ lines long, sub-obovate tapering to base, tip obtuse and rounded, glabrous and dark-green above (sometimes hairy, hairs substrigose adpressed), densely pubescent below, hairs white (reddish in young leaves), shining, short, appressed; midrib lower half prominent underneath; petiole 1–1½ lines long. Heads 3–5. together (sometimes solitary), narrow campanulate, sub 2½ lines long, patent, spreading, axillary among leaves; peduncles

914 *Olearia virgata* Hook.f.

slender, 2 lines long, hairy. Involucral scales hairy, in three rows; the *outer* 2–3–5 thickish, ovate, short, bract-like, dark-coloured (may be termed bracts, but they adjoin the other scales proper, and close round the head with them); the *inner* thin, green, shining, sub-linear-lanceolate, concave; tips acute and thickly woolly-ciliolate. Florets few, of disk and of ray equal in number, usually 4 of each, sometimes 5; *ray*, lamina small narrow pale-brown, tube slightly hairy, style two-thirds length of lamina, arms spreading, acuminate subacute; *disk* florets longest, much exserted, dark-brown, tube hairy, tips of lobes pubescent, anthers largely exserted [599] their tips very acuminate pungent, pale; stigmas large, rough, bristly, dark-red, tips acute. Pappus few, white, erect, scaberulous, shorter than disk-florets. Achene small linear terete, thickest at top, glabrous.

Hab. In low damp grounds, and on margins of watercourses, South Norsewood, County of Waipawa : *Mr. A. Olsen*; 1894–95. (Also, in former years, but barren: *W.C.*)

Obs. A species near to *O. virgata*, Hook.

Genus 17. *Senecio*, Linn.

1. *S. rufiglandulosis*,⁹¹⁵ sp. nov.

Annual. Herb stout, erect, simple, glabrous, 2 ft.–3 ft. high; stem thick, $\frac{1}{2}$ in. diameter, subangular, hard below but not woody. Leaves few, distant 1 in.–2 in. apart on stem, ovate acuminate acute, irregularly and coarsely duplicato-dentate, lamina 4 in. long, $2\frac{1}{4}$ in. wide,

915 *Stet.*

tapering to base and there largely dilated $\frac{1}{2}$ in. or more, cordate auricled but free from stem not clasping, soft, very thin, margins thickened and recurved (very plain in young leaves), light-green above, much paler below, glandular-pubescent; pubescence above suberect and curled, scattered, small, their tips darkish-red, smaller and shorter below; veins few, distant, 6-jugate, mid-rib stout, prominent underneath throughout lower half of leaf; petiole 2 in. long, succulent, stout, channelled, white, 3 lines wide, winged; wings denticulate. Flowers in a large loose many-branched diffuse corymbose panicle, 8 in.–10 in. diameter; main flowering-branches 10 in.–12 in. long, axillary, erect, slender, striate, terete, yellow-green, without leaves, but having a long narrow leaf-like bracteole at base of peduncle, each branch containing 5 heads, with a long linear toothed bract at base of lowest branchlet; pedicels slender, 6–9 lines long, with a subulate bract at base and another on pedicel. Heads campanulate, 3 lines long. Involucral scales many in a single row, oblong-acuminate, green, glandular, slightly viscid, margins broad white membranous greatly imbricate, tips hairy acute tipped with black, 4–5 narrow subulate bracteoles also tipped with black at base, spreading, clasping head. Flowers expanded $\frac{3}{4}$ in. wide, light-yellow; florets of ray 12, lamina narrow-oblong-lanceolate spreading and subrevolute, tip rounded 3-toothed, the central tooth obtuse and lower than the two outside ones; style arms small, slightly exserted from tube—of disk numerous (sub 40), 5-toothed; styles exserted short, linear truncate, much recurved. Pappus white, erect, a little longer than involucre, shorter than disk-florets, scabrid, acute. Achene linear semiterete,

densely pubescent, striate, slightly thickened upwards, base obtuse, alveolar. Receptacle rugged. [600]

Hab. East sides of Ruahine Mountain-range, about 3,000 ft.—4,000 ft. altitude, on margins of watercourses, and also on dry stony spots: *Mr. A. Olsen*; 1894—95.

Obs. This fine herb has some affinity with *S. glastifolius*, Hook. fil.

Order XLII. ERICEÆ.

Genus 1. *Gaultheria*, Linn.

1. *G. glandulosa*,⁹¹⁶ sp. nov.

Shrub glabrous (specimens 5 in. long, terminating in 3—6 branchlets, each 2 in. long, and nearly alike); bark pale, muricated with small red and black callous points, the young branchlets having a single long black flat hair-like scale, acuminate and strigose, appressed upwards from each dot. Leaves numerous, alternate, close, imbricate, flat, erect, lanceolate-oblong, 8 lines long, 2 lines broad, subapiculate, closely serrate; teeth apiculate with black callous points; tapering at base; petiolate; reddish-green; closely and regularly reticulated on both sides, minutely rugulose above with a kind of varnished appearance; petioles sub 1 line long, stout, red. Flowers very numerous, terminal in corymbose panicles, very close-set, small, reddish (dried). Calycine lobes broadly ovate, spreading, concave, margins glandular ciliolate; peduncles slightly pilose, much bracteate; pedicels

916 *Gaultheria rupestris* (L.f.) D.Don.

glabrous, 1 line long, with 3 sessile bracts at base, clasping, broadly deltoid-ovate, apiculate, margins glandular-ciliolate or serrate (*sub lens*). Corolla broadly campanulate, veined; tube $\frac{1}{10}$ in. long; lobes broadly deltoid, very obtuse, much recurved, margin of tips irregularly and minutely jagged. Stamens short, as long as anthers, warted, broadest at extreme base; anthers small, simply horned, minutely muricatulate, base rounded, dark-red. Style as long as tube, slightly exserted; stigma simple. Hypogenous scales longer than ovary, their tips rounded.

Hab. Ruahine Mountain-range, east side: *Mr. H. Hill*, 1894; *Mr. E.W. Andrews*, 1895.

Obs. A truly handsome and neat species, differing considerably from all known ones, yet having close affinity with *G. subcorymbosa*, Col. (Trans. N.Z. Inst., vol. xxii., p. 476).

Genus 3. *Cyathodes*, Br.

1. *C. articulata*,⁹¹⁷ sp. nov.

A (small ?) glabrous shrub; branch (specimen) 4 in. long, slender, woody, bearing several very short branchlets 1 in. long, bark greyish. Leaves suberect, close, decussate, imbricate, linear acuminate a little broader at base, $3\frac{1}{2}$ lines long sub $\frac{1}{2}$ line wide tapering into a long callous acute tip, thickish, [601] margins recurved entire; pale-dull-green above and somewhat glossy; paler below and 4-nerved, nerves white; petiole short, stout, broad,

917 *Leptecophylla juniperina* (J.R.Forst. & G.Forst.) C.M.Weiller
subsp. *juniperina*.

flattish, articulated to a little circular knob in the branchlet. Flowers terminal on the branchlets, 5–7 together forming small heads, pale-reddish or fawn colour; peduncles short, bearing small suborbicular bracts; calycine lobes or bracteoles larger, broadly ovate obtuse, pinkish, margins thin, minutely ciliolate at tips; corolla tubular sub 3 lines long veined; lobes 5, small ovate acute, glabrous not bearded; tube slightly hairy within; anthers adnate opposite angles of lobes, slightly exserted, linear, emarginate both ends, dark-brown; style erect, nearly as long as tube, slightly hairy below; stigma simple; ovary densely hairy; hairs appressed, pure white. Hypogenous scales, small, orbicular.

Hab. Hills in the interior, west of Napier; 1895.

Obs. I Of this plant I received only a solitary specimen (among those of other plants), apparently casually gathered in passing as of no great consequence; all the little branchlets on it were very similar and perfect.

II. I place it here under *Cyathodes* (not having seen its fruit) mainly owing to the lobes of the corolla being glabrous and the leaves so very pungent. A curious feature is the knobbed articulations of its branchlets for its leaves.

Genus 5. *Pentachondra*, Br.

1. *P. rubra*,⁹¹⁸ sp. nov.

A low shrub 3 in.–4 in. high, ascending, erect, much branched; branchlets short, 1 in.–2 in. long, bracteate; bracts numerous, imbricate, sessile, red-brown, ovate,

918 *Stet.*

obtuse, striate, small at base of branchlets increasing in size upwards, 1 line long at top. Leaves close-set, erect, narrow ovate (the uppermost linear-ovate), $\frac{1}{4}$ in. long, $\frac{1}{15}$ in. broad, obtuse, tips callous, glabrous, concave, margins finely ciliolate, 3–5 nerved below, pale-dull-green; petiolate, petioles $\frac{1}{2}$ line long, red, striate, stout, flattish. Flowers few, solitary, terminal, red; tube cylindrical, 3 lines long, glabrous and shining on outside, slightly hairy within; lobes 5, sub 1 line long, narrow linear-ovate subacute, recurved, spreading, densely bearded, hairs red; bracteoles broadly ovate, obtuse, much ciliate. Anthers linear, subclavate, widest at top, subacute at base; style erect, stigma capitate. Disk-scales, tips truncate. Fruit obovate, $\frac{1}{2}$ in. long, red, style persistent. Nuts 8, subreniform, gibbous, red, muricatulate-rugose.

Hab. Ruahine Mountain-range: *Mr. E.W. Andrews;* 1895.

Obs. This plant, having 8 pyrenes in its fruit, does not agree with its generic name, nor with Bentham's statement respecting the genus—viz., “with 5 distinct pyrenes, or *fewer* [602] by abortion” (*Fl. Austral.*, vol. iv., p. 163). Yet Hooker says of it, “Drupe of 5 or *more* small 1-seeded nuts” (*Handbook N.Z. Fl.*, p. 178). In other respects it agrees with the genus, and it may, with the next plant hereunder described, serve to unite those two.

Genus⁹¹⁹ *Trochocarpa*, Br.

1. *T. novæ-zealandiæ*,⁹²⁰ sp. nov.

A low bushy shrub, 1½ in.–2 in. high, much branched, glabrous; branches short; stems woody, slender, blackish. Leaves numerous, close, imbricate and spreading, lanceolate, 1½ lines long, ½ line wide, tip subacute-obtuse, 3–5-nerved below, rather thickish, margins entire; dark-purplish-green; petioles rather stout, ½ line long, red; margins of young leaves toward apex minutely ciliolate (*sub lens*). Flowers few, solitary, terminal and axillary on tips of branchlets, sessile. Sepals 5, ovate-acuminate, tips obtuse, margins finely ciliolate; 2 broad bracteoles below calyx, and smaller roundish ones outside. Corolla subcylindrical, 2 lines long, valvate in bud, tip acute, white with pink tips on outside; tube slightly hairy half-way down; lobes 5, equal, acute, much bearded within, and 2-nerved from base. Anthers linear-oblong, brown, adnate, close to angle-bases of lobes; style stout, erect; stigma capitate, papillose. Fruit red, globular, shining, 2 lines diameter, pulpy, style persistent. Seeds 9, yellow, oblong, plano-convex.

Hab. Summits Ruahine Mountain-range, east side: *Mr. A. Olsen*; January, 1895.

Obs. It is not without some doubt that I place this neat little plant under this endemic Australian genus. It has much of the common appearance (*prima facie*) of a

919 WC: An Australian genus, closely allied to the preceding, but not hitherto detected in New Zealand.

920 *Stet.*

Pentachondra, but its fruit is strikingly different, also its pyrenes, and its corolla-lobes are not so densely bearded.

Genus 8. *Dracophyllum*, Lab.

1. *D. pungens*,⁹²¹ sp. nov.

A (small ?) shrub (specimens 6 in. long); branches straight, erect; very leafy, simple; bark dark-purple with thin silvery scurf epidermis; branchlets 3–4 near top, subopposite and subfascicled, very slender, 1 in.–2 in. long, $\frac{1}{30}$ in. wide, erect, bearing 4–5 leaves at tips; bark red, glabrous, shining. Leaves erect, subrigid, filiform, 2½ in.–2¾ in. long, $\frac{1}{2}$ line wide, thickish, concave above, semi-terete below, margins entire, tips pungent; colour pale-yellowish-green, fugacious in drying; sheaths large, 5 lines long, 2 lines wide, red, margins thin, [603] dilated rather suddenly but not truncate, minutely and sparingly ciliolate at apex extending a short distance on margins of lamina. Flowers terminal on main branch in a short stout raceme 1¼ in. long, $\frac{1}{2}$ in. wide, 7–9 together, alternate, subdistichous, not crowded; bracteoles few, the outer one longer than corolla, inner shorter, broadly ovate-acuminate, their margins very membranous and finely ciliolate, bases enwrapping; pedicels short, stout, wrinkled. Sepals narrow-ovate-acuminate, very acute. Corolla red, campanulate, 4 lines long, mouth 2½ lines diameter, lobes large, deltoid acuminate acute, recurved. Anthers oblong-ovate, obtuse. Style 1 line long, capitate. Scales half as long as ovary, broadly cuneate, tips truncate.

921 Possibly *Dracophyllum filifolium* Hook.f.

Hab. On Ruahine Mountain-range, east side : *Mr. H. Hill*; 1895.

2. *D. varium*,⁹²² sp. nov.

A shrub; ascending, erect (single specimen 6 in. long, 6-branched at top); main stem stoutish, 1½ lines diameter (naked below for 2 in.), bark greyish, much fissured longitudinally, ringed; branchlets slender, ringed regularly $\frac{1}{15}$ in. apart, bark red-brown, shining with thin silvery epidermis. Leaves terminal, close, clasping and subimbricate at bases, patent and subrecurved, linear acuminate, 1½ in. long, 1 line wide at base of lamina, not coriaceous nor stout, slightly concave, nerved, margins faintly scaberulous below finely serrulate above, tips subacute, colour dull darkish-green; sheathing bases reddish, 1½ lines long, $\frac{1}{10}$ in. broad, soon dilated but not truncate, 6-nerved, margins thin entire, very finely and shortly ciliolate on shoulders only. Flowers terminal in short stout spikes sub 1 in. long, 8–10–12-flowered, very close together, almost hidden in bracteoles which are ovate-acuminate, as long as or longer than corolla, margins much ciliolate, tips acute. Sepals linear, acute, transversely wrinkled, red-brown. Corolla reddish, small, 1½ lines long, tubular; lobes erect, subovate-obtuse, their margins undulate. Anthers narrow-oblong, 2-lobed, adnate, nearer the mouth of tube than usual, so as to be partly on lobes at their bases. Style short, stout. Ovary small, grooved, narrowest at base; scales as long as ovary, broadly cuneate, their tops rounded, retuse.

Hab. On Ruahine Mountain-range: *Mr. H. Hill*; 1895.

922 x *Dracophyllum varium* Colenso.

3. *D. angustifolium*,⁹²³ sp. nov.

Shrub erect, much branched, fastigiate, slender (specimens 8 in.–9 in. long); bark dark-red, shining on young branches; branches numerous, subfascicled, very slender, almost filiform, $\frac{1}{30}$ in. diameter, 5 in.–7 in. long, distantly and regularly scarred; secondary branchlets also long, simple, with many buds of [604] branchlets. Leaves numerous, imbricate and sheathing, close at tops of branches but distant along young branchlets, subulate, thickish, 3–9 lines long, $\frac{1}{40}$ in. wide, tips obtuse with a callous mucro, margins minutely and finely serrulate (*sub lens*), concave above semiterete below; sheaths gradually dilated, 2 lines long, 5-nerved, their margins very thin, ciliolate on upper portion. Flowers few, 2–3 together, terminal on small stout lateral branchlets. Calyx sub-linear-lanceolate, $1\frac{1}{2}$ lines long, margins thin, ciliolate, tip mucronulate. Corolla red, longer than bracteoles, 2 lines long; lobes deltoid subacute erect, margins slightly uneven and incurved. Anthers orbicular. Style short, stout, ovary truncate at apex. Scales broadly cuneate, their tips truncate and slightly retuse.

Hab. Ruahine Mountain-range: *Mr. H. Hill*; 1895.

Obs. A species of a most peculiar aspect, from its very slender fastigiate branches, and excessively narrow and short erect leaves.

923 *Stet*, or possibly *Dracophyllum filifolium* Hook.f.

4. *D. brachyphyllum*,⁹²⁴ sp. nov.

A small low shrub (from specimens 4 in.–5 in. long, one of them being apparently gathered from base), ascending or suberect, much branched; branchlets fastigiate, short, suberect, 1 in.–2 in. long, slender, much scarred (or, more properly, ringed), regularly 1 line apart; bark red-brown, glabrous, shining. Leaves rather numerous, patent, recurved, linear subulate, thickish, 5–7 lines long, $\frac{1}{20}$ in. wide, subquadrifilariously disposed, concave, veined, margins finely serrulate, tips obtuse with a minute callous subacute mucro; colour dull-dark-green. Sheathing-bases largely clasping, 3 lines long, 2 lines wide, much veined; margins membranous, finely and minutely ciliolate above, gradually contracting into lamina. Flowers few, close-set, terminal on main branch in a short stout raceme sub 1 in. long and bearing 7–9 flowers; bracteoles $\frac{1}{4}$ in. long (as long as tube of corolla), deltoid acuminate, 2 lines broad at base, many veined, enwrapping, margins membranous and finely ciliate; tips thickened acute, callous; the outermost one a little longer than corolla with its tip dilated; pedicels stout, 1 line long, transversely wrinkled. Sepals narrow linear, very concave, margins ciliate. Corolla 3 lines long, cylindrical, red; lobes small, recurved. Anthers small, oblong, situated lower down in tube than usual. Style longer than ovary, stout; ovary small, sides grooved. Scales broadly cuneate, truncate, slightly retuse, higher than ovary and slightly incurving over it.

Hab. Ruahine Mountain-range: *Mr. H. Hill*; 1895.

924 *Stet.*

Obs. A species near *D. recurvum*, but differing in several characters. [605]

5. *D. virgatum*,⁹²⁵ sp. nov.

Shrub erect (“6 ft. high”), bark greyish, much branched; branches virgate, 10 in.–14 in. long, slender, scarred, ringed 1–1½ lines apart; branchlets numerous, 3 in.–5 in. long, very slender, $\frac{1}{20}$ in. diameter, erect. Leaves pale-green, filiform, $4\frac{1}{2}$ in.–5 in. long, $\frac{1}{30}$ in. wide, acute, channelled, margins minutely serrulate. Sheathing-bases $\frac{1}{2}$ in. long, 2 lines wide, glabrous, reddish-brown, auricled, auricles acute, margins entire membranous. Flowers (“white sweet-scented”) terminal in single racemes sub 1 in. long, 7–8-flowered, on short lateral rather distant branchlets; flowers alternate, with 3 (sometimes 4) long leafy bracts at base of raceme; pedicels short, 1 line long, stout; bracteoles ovate-acuminate, concave, ciliolate, longer than tube, the outermost one largely awned, the inner ones pubescent above on middle of back. Sepals ovate-acuminate, nearly as long as corolla, pungent. Corolla small, dark-red, tube 1 line long, lobes spreading narrow ovate-acuminate; tips thickened, slightly incurved. Style stout, exserted, persistent. Stigma large, obsoletely 5-lobed, papillose, shining.

Hab. On Ruahine Mountain-range, east side: Mr. A. Olsen; 1895.

Obs. A very striking shrub of this genus; its very long and slender branches and leaves allies it with *D.*

925 *Dracophyllum filifolium* Hook.f.

squarrosum, from which species, however, it is very distinct.

6. *D. heterophyllum*,⁹²⁶ sp. nov.

An erect (small ?) shrub, my specimen a single branch 3 in. long; slender, bark dark-purple, glabrous, ringed 1 line apart; branchlets opposite, 3, subfascicled, besides the main one, and 1 in. above two others similar. Leaves rather numerous, of irregular lengths, linear, erect, nearly rigid, dull-pale-green, terminal—on main branch $4\frac{1}{4}$ in. long $\frac{1}{20}$ in. wide, on lowermost branchlets 3 in. long, and on two uppermost branchlets $1\frac{1}{2}$ in. long—and filiform, sub $\frac{1}{30}$ in. wide, canaliculate above, semiterete and striate below, margins entire or very minutely scabrid (*sub lens*), tips acute. Sheathing-bases abruptly expanded, $1\frac{1}{2}$ –2 lines wide, half-clasping, red, the upper portion of margins minutely ciliolate. Flowers in short terminal spikes, $\frac{3}{4}$ in. long, 6-flowered, alternate, sessile; calycine bracts (6) as long as tube of corolla, closely enclosing one another, the inner 4 very small and narrow, 1 line long, subulate, very acute, margins thin and ciliolate; the 7th or outermost bract broadly deltoid, 4 lines long, including the narrow subulate sharp callous tip, which is 2 lines long. Corolla tubular, 3 lines long, glabrous, red, 2 lines diameter at mouth; lobes spreading ovate, subacute, thin, veined. Anthers suborbicular, emarginate, and cordate. Style half as long as corolla. Stigma [606] capitate. Hypogenous scales oblong, longer than ovary, their tips rounded.

926 *Dracophyllum filifolium* Hook.f.

Hab. Ruahine Mountain-range, east side: *Mr. E.W. Andrews*; 1895.

Order L. BORAGINEÆ.

Genus 1. Myosotis, Linn.

1. *M. (Exarrhena) venosa*,⁹²⁷ sp. nov.

(A single specimen, evidently taken from a rootstock.) Ascending and erect, simple unbranched, slender, strongly ribbed, 10 in. high (including racemes not fully expanded), hairy; hairs long, patent, white, arising from muricated points. Leaves on stem few (6), alternate, distant $\frac{1}{2}$ in.– $\frac{3}{4}$ in. apart; oblong apiculate, $1\frac{1}{4}$ in. long, $\frac{1}{2}$ in. wide, strigosely hairy on both sides, ciliate, brown (so calyx), midrib prominent below, the lower 4 subpetiolate, lamina tapering to base; on top of stem a pair much smaller opposite and sessile, enclosing 2 racemes, one 4 in. and one 2 in. long, largely scorpioid, the shorter one with a leafy bracteole $\frac{1}{2}$ in. long just below the lowest pedicel. Flowers 10–15, alternate (not all unrolled), distant 3–4 lines apart on stem; pedicels slender, 2 lines long; calyx broadly campanulate, very rough and hairy, 2 lines long, cut halfway to base; lobes ovate subacute, ciliate, with a strong middle nerve, much veined with an intramarginal vein, veinlets anastomosing. Corolla twice as long as calyx, 5 lines diameter, reddish (dried, probably whitish or cream-coloured fresh); tube 2 lines long, very narrow; lobes large, broadly rounded and slightly retuse, much veined, veins anastomosing; scales

927 *Stet.*

of throat-margin rather large, kidney-shaped, slightly retuse. Anthers exserted, linear, tips subacute, bases hastate; style long; stigma small, clavate, bifid. Nuts broadly ovate, obtuse, turgid, pale-brown; testa very thin, semi-transparent, shining, showing seed within.

Hab. Ruahine Mountain-range, east side: *Mr. E.W. Andrews*; 1895.

Order LIII. SCROPHULARINEÆ.

Genus 7. *Veronica*, Linn.

1. *V. hillii*,⁹²⁸ sp. nov.

A small compact bushy shrub, 12 in.–18 in. high; whole plant glabrous. Leaves numerous, decussate, close-set 2 lines apart on branchlets, patent, subfalcate, oblong-lanceolate, 1½ in. long, 4½ lines wide, not narrowed into petiole, slightly laterally subrevolute not flat, thickish, opaque, dark-green above, pale-green glaucescent below, margins slightly dentate-serrate (5–8 serratures on each side); midrib stout, prominent below, thickened at tip, obtuse; petiole short almost subsessile, stout, [607] adpressed to stem. Flowers subterminal and subcorymbose, racemes axillary, slender, a little longer than leaves; peduncles very slender, ½ in. long, bracteate, usually 4 pairs of bracts (sometimes binate, and also ternate), pedicels short, stout; bracteoles as long as sepals, thin; the two bracts of lowest pair of pedicels (also subpeduncles) nearly twice as long as bracteoles. Flowers white; sepals narrow sub-ovate-acuminate, 1½

928 *Hebe colensoi* (Hook.f.) Ckn var. *hillii* (Col.) L.B. Moore.

lines long, thin; corolla 3 lines diameter, spreading, 4-lobed, lobes nearly alike narrow ovate-acuminate, tips incurved (sometimes rarely 3- and 5-merous), the lower lobe the smallest; tube sub 1 line long, wide, throat naked; style very long, more than twice as long as calyx; capsule broadly ovate-elliptic; seeds few, thin, flattish, rather irregularly shaped, suborbicular, broadly elliptic, and obovate, pale-brown, glabrous.

Hab. At Kuripapango, on the River Ngaruroro, in the hilly interior, County of Hawke's Bay: *Mr. H. Hill*; 1894.

Obs. I. A very graceful flowering-shrub, its flowers presenting a peculiar neat and striking star-like appearance. It will range naturally near to *V. colensoi*, Hook., and *V. darwiniana*, Col. (*Trans. N.Z. Inst.*, vol. xxv., p. 331). In drying, the leaves lose much of their dark-green colour above, and become glaucous.

II. Mr. Hill brought away living plants, which have done well in his garden at Napier.

2. *V. olsenii*,⁹²⁹ sp. nov.

A small neat prostrate shrub with short procumbent branches, rooting at nodes; branches slender, thickly pubescent, hairs short, patent; bark dark-red. Leaves rather close, opposite, subsecund, sub-rhombic-orbicular, 4 lines diameter, deeply cut, serrate, 3 teeth on the side (sometimes only 2), tip obtuse and subacute, glabrous, dark-green, thickish; petiole 1 line long, stout, canaliculate, glabrous, edges pink. Flowers in slender

929 *Parahebe hookeriana* (Walp.) W.R.B.Oliver var. *olsenii* (Col.)
M.B.Ashwin.

erect axillary opposite peduncles 4 in.–5 in. high, the lower half (or more) naked, finely and closely pubescent (as also pedicels); flowers 15–20, alternate, rather distant, patent; pedicels 4–5 lines long, very slender, with a single sessile bract at the base (in one specimen 3 together subfascicled, with 3 bracts), bracts ovate obtuse $\frac{1}{10}$ in. long, the lowest pair 2 lines long (rather large for so small a plant), glabrous, margined, margin ciliolate. Sepals large, rhombic-ovate, obtuse, glabrous, thick, the apical portion of margins glandular-ciliolate. Corolla small, sub 3 lines long; tube very short; lobes 4, 3 of them orbicular, 1 (the lower) oblong, tip rounded entire, conniving, white with a pink throat and a few faint pinkish dashes. Stamens inclosed, shorter than lobes; anthers cordate obtuse; [608] style long, slender, flexuous, persistent; stigma simple. Capsule didymous, subpyriform, turgid, nearly twice as long as calyx (one specimen tri-celled). Seeds numerous, broadly elliptic-obovate, slightly turgid, dull-yellowish.

Hab. Ruahine Mountain-range, east side: *Mr. A. Olsen*, 1894–95.

Obs. I. The affinities of this neat little species are with *V. bidwillii* and *V. lyallii*, differing, however, from both in several characters.

II. Named after its discoverer, Mr. A. Olsen, of South Norsewood, a zealous collector and lover of plants, as many of them detected by him and described by me in this and in several preceding volumes of the "Transactions of the New Zealand Institute" bear ample witness. Of this genus, this species, with others, and many other plants from the mountain-ranges, flourish

admirably in his well-stocked garden, the proximity to the mountain and its altitude being so suitable.

3. *V. marginata*,⁹³⁰ sp. nov.

A small shrub(?) (two specimens received by post); young branchlets 6 in. long, simple, leafy alike throughout, bark pale-green, densely pubescent. Leaves decussate, spreading not crowded, 3 lines apart, broadly lanceolate, 1 in. long, 4 lines wide, tips acute produced, bases abrupt subtruncate, chartaceous, bright-green on both sides, glabrous, not flat, slightly revolute; margins entire, hairy, their extreme lateral edges minutely and thickly pubescent, hairs greyish; midrib sunk and finely pubescent above, very prominent below, excurrent, thickened and subscaberulous at tip; petioles 1 line long, stout, broad, glabrous, their bases half-clasping and semi-connate. Flowers rather numerous, terminal in small close corymbs $1\frac{1}{2}$ in.–2 in. diameter, also axillary and subterminal in short deltoid distichous loose racemes, $1\frac{1}{2}$ in. long and 1 in. wide at base, 5-jugate; pedicels patent, $1\frac{1}{2}$ lines long, glabrous (sometimes finely but thickly puberulent), each with a small linear-ovate bract at base minutely ciliolate (also sepals). Sepals 4, large, half as long as capsule, ovate-acute, spreading. Corolla large, sub $\frac{1}{2}$ in. diameter, tube, very short or 0, throat wide; lobes 4, suborbicular, entire, the lowermost one only a little smaller, largely veined; colour white slightly dashed with lilac. Stamens included, stout; anthers cordate, obtuse, dark-purple. Style 2 lines long, slender, curved; stigma small, simple. Capsule (immature) slightly

930 Probably *Hebe elliptica* (Forst.f.) Pennell var. *crassifolia* Ckn. & Allan.

inflated, broadly ovoid, 3 lines long. Seeds oblong-obovoid, turgid, glabrous, pale.

Hab. From garden of Mr. A. Wall, Porirua, near Wellington (per *Mr. R.C. Harding*); 1895. [609]

Obs. A very distinct, striking, and graceful species, differing largely from all others known to me, but having some affinity with *V. elliptica*, *V. benthami*, *V. laevis*, and *V. buxifolia*. Its large flowers without tube (which makes them fugacious), 4-fid calyx with sepals large and sharply acute, elegant-shaped and symmetrically-placed leaves with their curious puberulous margins and produced tips, make the plant an attractive and pleasing object.

Order LXVII. THYMELEÆ.

Genus 1. Pimelea, Banks and Solander.

1. *P. subsimilis*,⁹³¹ sp. nov.

A dwarf shrub 10 in.–12 in. high, erect, stout; branches few, thick, short, scarred, densely clothed with patent white hairs between upper leaves; bark reddish, covered with minute black tubercles between scars. Leaves quadrifariously disposed, very close and imbricate, narrow oblong-ovate, 2–2½ lines long, tip obtuse, subsessile, concave, thickish, glabrous, reddish-brown (dried), midrib very stout and prominent below; petiole broad, thick, wrinkled; floral leaves 4, unequal, one being a very little larger and three smaller than those of the

931 Possibly *P. buxifolia* Hook.f.

stem, but thinner, greenish, with lateral nerves visible. Flowers terminal in small corymbose heads, 4–8 together; receptacle hairy; perianth sub $\frac{1}{2}$ in. long, very hairy on the outside, especially at base, with long white hairs extending upwards; lobes pink-coloured, broadly ovate, tips ciliate. Anthers exserted, shorter than lobes, broadly ovoid, obtuse, cordate. Style included, length of tube, simple.

Hab. Ruahine Mountain-range: *Mr. H. Hill*; 1895.

Obs. A species having close affinity with *P. stylosa*, Col. (Trans. N.Z. Inst., vol. xx., p. 205), but of more robust habit, erect and simple, possessing much smaller leaves and flowers, with much longer white hairs, style included, &c.

2. *P. dasyantha*,⁹³² sp. nov.

Shrub low, bushy, suberect, 12 in.–15 in. high, much branched; bark brown, striate; branches, leaves beneath, and flowers densely strigosely hairy; hairs very long, acute, pure white. Leaves numerous, subdecussate, slightly imbricate, and rather distant, broadly ovate and subacute, 4–5 lines long, glabrous and minutely subpapillose above, with thick white hairy ciliolate margins, subsessile; petioles small, thickish, reddish, glabrous. Flowers in small terminal heads of 5–9; receptacle densely hairy, hidden by long white hairs; floral leaves similar to stem leaves but rather smaller. Perianth small, oblong, 3 lines long, sessile, hairs extending [610] nearly 1 line beyond lobes; tube 2 lines long, veined, within lobes very small, broadly oblong,

932 Possibly *P. arenaria* A. Cunn.

$\frac{1}{16}$ in. long reddish, veined. Anthers sub-oblong-ovoid, red, connective very small, apiculate. Style rather long, flexuous; stigma capitate, papillose; anthers and style exserted equal lengths. Ovary dark-green, subobovoid, hairy at top.

Hab. On stony dry ridges near the River Waimataa, County of Patangata (the provincial boundary between Hawke's Bay and Wellington): Mr. H. Hill; November, 1895.

Obs. I. On one of the branchlets, directly under the largest head of flowers and entirely concealed by it, I found two young branchlets a few lines in length, full leafy; showing that, shortly, that terminal head of flowers would become axillary in the fork occasioned by those two branchlets; and, further, in looking over the specimens I found the dead remains of receptacles of flowers in the axils of the old branches, confirming the same. I had, however, noticed that peculiar character before in *P. dichotoma*, a much larger species (Trans. N.Z. Inst., vol. xxii., p. 485).

II. This species will rank near to *P. arenaria*, A. Cunn., which, *prima facie*, it much resembles.

Class II. MONOCOTYLEDONS.

Order I. ORCHIDEÆ

Genus 12. Pterostylis, Br.

1. *P. venosa*,⁹³³ sp. nov.

Plant small; leaves 2 near the base of the stem, suborbicular-oblong, $1\frac{1}{4}$ in. long, 1 in. wide, very membranous, largely veined, veins prominent anastomosing, areoles large subquadrilateral; petioles also veined, broad, loose, clasping, with 2 sheathing-scales at base. Scape $2\frac{1}{2}$ in. high, naked. Galea erect, $\frac{3}{4}$ in. long, hood-shaped, greenish; dorsal sepal ovate-acuminate, obtuse; lower lip small, cuneate, sub $\frac{1}{2}$ in. long, ascending, with 2 linear-ovate lobes, tips finely acuminate, extending a little beyond dorsal sepal; petals $\frac{3}{4}$ in. long, sub-linear-spathulate with an obtuse angle produced on outer edge near the middle, tips broadly truncate. Labellum sub $\frac{1}{2}$ in. long, purplish, ovate-acuminate, parallel-veined, tip very slender, slightly exserted. Column sub $\frac{1}{2}$ in. high, very slender, wings with lower lobes oblong-obtuse, upper lobes, or teeth, short, narrow, acute.

Hab. Ruahine Mountain-range, east side: *Mr. A. Olsen*; 1894.

Obs. I have only received two specimens of this little plant, and they are very similar; unfortunately, though whole and perfect, they have been pressed very much in drying, so [611] that it has been a difficult matter to ascertain correctly their finer internal construction, on which so much depends, and I have only dissected one of them.

2. *P. subsimilis*,⁹³⁴ sp. nov.

Plant 8 in. high. Leaves, radical 0; stem-leaves 5; distant, lanceolate, much acuminate, the 4 uppermost 4 in. long $\frac{1}{2}$ in. wide, the lowest leaf small and narrow 2 in. long, sessile, half-clasping, very membranous; midrib slight; veins distantly reticulated, forming long areoles; near base of the stem 3 short sheathing-bracts. Scape slender, 1-flowered. Galea erect, curved; dorsal sepal 2 in. long, very acuminate; petals linear-lanceolate, $1\frac{1}{2}$ in. long, acute; lower lip deltoid, $\frac{1}{2}$ in. long, its two lobes long and slender with filiform red tails embracing galea; labellum red, $3\frac{1}{2}$ in. long, lanceolate, veined; veins parallel; midrib stout, minutely papillose, tip truncate; appendage broadly cuneate, curved, trifid, tips fimbriate; column erect, wings large $3\frac{1}{2}$ lines long; lower lobes much produced, obtuse, rounded; upper lobes or teeth very narrow, erect, shorter than column; the uppermost dorsal margin of wings rounded and free from column; anther-hood large, erect, concave, apicular, reddish; stigma long, wider than column. Ovary 7 lines long, very slender.

Hab. Ruahine Mountain-range, east side : *Mr. A. Olsen*; 1894.

Obs. A species *prima facie* resembling *P. speciosa*, Col. (Trans. N.Z. Inst. vol. xxii., p. 488).

934 Currently included in *Pterostylis patens* Col.

Order VII. LILIACEÆ

Genus 5. *Astelia*, Banks and Solander.

1. *A. minima*,⁹³⁵ sp. nov.

Plant very small, tufted; rootstock not woody, coalescent, softish, 3 in. (*et alt.*) long. Leaves (5) linear, 1½ in.–1¾ in. long 1½ lines broad, tips acuminate, acute, margins recurved, midrib very prominent below, scurfy with long white shining irregular scaly hairs above (also the scape, pedicels, and flowers), but glabrous below and nerved, their bases thickly covered with long silky white acuminate scales, and the young leaves densely margined with reddish shining scales. *Male*, Scape slender, as long as leaves, forked about the middle, on one arm 3 and on the other 2 flowers, with 1 flower in the axil of the fork; flowers distant, free, on long pedicels; a long linear leaf-like bract at base of fork, and a smaller filiform one at base of lowest pedicel; pedicels 1½ lines long. Perianth spreading, 3 lines diameter; segments narrow ovate-acuminate, the 3 inner narrower, each with a little knob near apex within. Anthers elliptic, emarginate, [612] green, much shorter than ovary; style short and thick; stigma coarse, truncate, obsoletely 3-angled. *Female*; Only imperfect and damaged flowers seen.

Hab. Ruahine Mountain-range, east side: *Mr. H. Hill*, 1895; *Mr. E. W. Andrews*, 1895.

Obs. This is another small mountain species, allied to *A. linearis*, Hook., of the same mountain-range (and also of the Antarctic Islands, Auckland, and Campbell's); to *A.*

935 *Astelia linearis* Hook.f. var *novæ-zelandiæ* Skottsb.

alpina, Br., of Tasmania; and to *A. pumila*, Br., of Fuegia and the Falklands; but differing from them all. Of the specimens received, the *female*-flowered plants were much damaged and past flowering; sufficient, however, remained to show their great difference from their congeners.

Order XI. CYPERACEÆ

Genus 14. Carex, Linn.

1. *C. inconspicua*,⁹³⁶ sp. nov. (non Steud.).

Plant very small, 1½ in.–1¾ in. high, erect, thickly cæspitose. Leaves very narrow, filiform, semiterete, canaliculate, irregular in length, finely serrulate at top, tips obtuse, green, sheathing below, 6–8 together. Culms a little longer than leaves; spikelet solitary, small, 1–1½ lines long, broadly cuneate, spreading, usually 4 together; the two outer scales long, bract-like, the outermost ½ in. long, tip stout, obtuse; the next ¼ in. long, tip slender, acute, both finely serrulate. Glume rather large for plant, ovate-acuminate, brown, enwrapping, margins membranous, tip much produced, serrulate. Utricle ovoid acuminate, tip 2-fid, lobes long sharp pointed serrulate. Style long, margins serrulate; stigmas 3 (sometimes 2) dark-brown, long, rough, curved.

Hab. Ruahine Mountain-range, east side: *Mr. A. Olsen*; 1895.

936 *Carex acicularis* Boott.

Obs. Allied to *C. acicularis*, but a smaller plant, without the linear scale of that species, with differently-shaped spikelet, long style, &c.

Order XII. GRAMINEÆ.

Genus 16. *Danthonia*, De Candolle.

1. *D. nervosa*,⁹³⁷ sp. nov. (Col., *non* Hooker).

Plant small, tufted; rootstock hard, slightly knobbed, much branched; branches short, patent, spreading and ascending, with many white glabrous sheathing striate bracts at bases of leaves and clothing nodules. Culms erect and drooping, 7 in.–9 in. (rarely 12 in.) long, slender, almost filiform, glabrous, striate, pale-green, nodes blackish, with three short stem-leaves nearly equidistant. Leaves few, one third [613] length of culms, 1 line wide at base, sub $\frac{1}{2}$ line wide above, largely striate, tips subacute, whitish, callous, pale-green, subglaucous, scaberulous dotted between striae below, closely revolute, finely hairy, largely sheathing, orifice of sheath very hairy within. Raceme small, rather narrow, 1 in.–1½ in. long, minutely scaberulous, bearing 5–7 upright pedunculate spikelets; at base a long leaf-like sheathing bract, tip truncate with erect ciliæ; peduncles 1 line long. scaberulous and slightly hairy, with a long linear scarious bracteole at base. Spikelets not crowded, obovate, suberect, 4 lines long, containing 3–5 florets, with a small linear membranous bracteole at base; glumes and awns pale-green dashed with purple; outer

937 Possibly *Rytidosperma clavatum* (Zotov) Connor & Edgar.

empty glume 3 lines long, ovate, 10 nerved; nerves bright-green, prominent, each forming a double line, margin ample membranous, shining, white, tip obtuse its margin scaberulous; second empty glume margins scabrid; tip jagged; white hairs around base. Flowering-glume deeply 2-fid, lateral awns very long, longer than glume and nearly as long as central awn; central awn long, flat dark-brown, shining and twisted below; awns scabrid, erect; two bundles of long hairs on lateral margins of glume, hairs rigid unequal, scaberulous, acute. Galea subobovate, margins sparingly hairy; tip bifid, rigid-ciliolate. Ovary obovate, brown, tip bi-cornuted to base of styles; stigmas slightly branched at top, branches long, flexuous, strangulated.

Hab. Dry hills, altitude 1,000 ft.–3,000 ft., Hawkston, County of Hawke's Bay: Mr. *Thomas Hallett*; 1894–95.

Obs. I. The affinities of this species are with *D. racemosa* R. Br. and *D. penicillata* (*Arundo penicillata*, Labill., Pl. Nov. Holl., i., 26, tab. 34), but differing in several characters. Specimens received were obtained after flowering.

II. Mr. Hallett kindly informs me that this grass makes a close sward, but every plant only grows in its own simple tuft. Cattle and sheep are very fond of it, and crop it closely. It grows well during winter, and is about equal to most other grasses during summer for grazing purposes; and even while being closely grazed it perfects seed, owing to its habit of sending out many of its culms horizontally. A valuable grass on unploughable hills.

1895 New Zealand Cryptogams : A List of a Few Additional Cryptogamic Plants, of the Orders Hepaticæ and Fungi, more recently detected in New Zealand. *Transactions of the New Zealand Institute* 28: 614-615.

[*Read before the Hawke's Bay Philosophical Institute, 21st October, 1895.*]

DURING the last year (1894) I sent to Kew several parcels of cryptogamic plants that I had collected during preceding years in the bush district of Hawke's Bay; mosses and lichens formed by far the larger portion, with some Hepaticæ and *Fungi*. From letters since received from the director there, I find the following species were determined as being new to the botany of New Zealand. The *Hepaticæ* (as on former occasions) were submitted to Dr. F. Stephani, of Leipzig, for examination and report:—

HEPATICÆ

Plagiochila olivacea, *Steph.*, sp. nov.

Jamesoniella patula, *Steph.*

Frullania kirkii, *Steph.*, sp. nov.

Trichocolea tomentella, *Sw.*, alpine form.

Metzgeria furcata, *var. nuda*.

Of *Hepaticæ* there were 112 distinct packets (many being duplicates, in fruit, &c, of those formerly sent), but of them these five were not received before, and only two of them were *species novæ*.

FUNGI.

- Agaricus (Leptoma) lampropus; Fr.
 A. (Omphalia) pyxidatus, Bull.
 Flammula xanchophylla, Cooke and Mass.
 Polystictus pinsitus, Fr.
 P. citreus, Berk.
 P. occidentalis, Kl.
 Favolus hepaticus, Kl.
 Irpex flavus, Jungh.
 I. sinuosus, Fr.
 Corticeum lacteum, Fr.
 Clavaria juncea, Fr.
 Bovista amethystina, C. and M.
 Æcidium epilobii, DC.
 Peniophora gigantea, Mass.
 Tremella mesenterica, Fr.
 Hydnangium brisbanense, B. et Br.
 Stemonitis fusca, Roth. [615]
 Rhizopus nigriopus, Ehr.
 Mucor mucedo, L.

With several others (*Fungi*) that were duplicates of species; formerly sent, together with some that were immature, imperfect, mycelium only, and not determinable.

One species in particular of this named lot deserves a passing special mention—viz., *Hydnangium brisbanse*—as this curious species I found here at Napier in my house-paddock, growing pretty plentifully on the ground under the shade of some large blue-gum trees (*Eucalyptus globulus*), where I had never noticed it before. It is as its specific name denotes, an Australian

species. Other Australian species (*e.g.*, *Polystictus citreus*, *Irpex flavus*, *Stemonitis fusca*, &c.) were also among the little lot sent, obtained by me from the distant forests; but this one is a species of a more especial and small Australian genus, two other species of this genus, being also known—*H. tasmanicum*, Kalch, and *H. austroliense*, Berk, (this last, however, was subsequently removed by Berkeley himself into an allied Australian genus, *Octaviana*). This is also the second time that I have found peculiar Australian species of *Fungi* here at Napier on the bare ground under blue-gum trees. Of course, I do not mean to imply there is any connection, anything regular, natural, or occult in the circumstances (“There is a river in Macedon; and there is also a river at Monmouth; but ‘tis all one: and there is salmons in both,” as Shakespeare has it); but it almost seems like a peculiar concatenation of secret natural phenomena which, though at present merely noticed, will probably hereafter become elucidated.

1895 Cryptogams: A Description of Two new Ferns, a New Lycopodium, and a New Moss, lately detected in our New Zealand Forests.
Transactions of the New Zealand Institute 28: 615-618.

[*Read before the Hawke's Bay Philosophical Institute, 21st October, 1895.*]

Class III. CRYPTOGAMIA.

Order I. FILICES.

Genus 16. Lomaria, Willd

1. *L. distans*,⁹³⁸ sp. nov.

Plant small, tufted, glabrous. Rootstock slender wood hard, black, composed of coalesced stipites, thickly clothed [616] with scales, which are also sparingly scattered on stipe; roots descending, wiry. Fronds erect, submembranaceous, dull green (dried), linear-lanceolate; stipe and rhachis very slender, almost filiform, smooth, deeply channelled, dark-brown. Barren fronds various sizes, 2½ in.-5 in. long, 4-5 lines broad, sometimes subhorizontal and spreading, rhachis flexuous, pinnatifid; lobes numerous cut nearly to rhachis (and generally distinct in middle of frond, almost pinnate (pinnato-pinnatifid), as shown by the small red marginal line of separation between them), not close, sinuses broad; inferior lobes opposite; superior alternate and zigzag, deltoid and oblong, sessile, adnate, margins recurved, sub-crenulate-toothed, their tips pointed with a tooth, coarsely veined; veins forked, usually 3-jugate, not

938 Possibly *Blechnum penna-marina* (Poir.) Kuhn.

extending to margin, tips clavate and subtranslucent; apical lobe short, narrow, acuminate acute. *Fertile fronds* twice as long as barren, stipe very long usually 5 in.—6 in., pinnate; pinnæ opposite, distant 2–3 lines apart on rhachis, very small, 2 lines long, sub 1 line wide at base, narrow deltoid-acuminate, falcate reversed, adnate and continuous produced upwards on rhachis (*sursum currens*), sub-rugulose, margins irregularly undulate; tips pointed; dark-brown. Involucre large, inflated, pale-brown, margin laciniate and overlapping. Sori numerous, covering whole under-surface of pinna; sporangia on long pedicels. Scales deltoid, obtuse, cordate, half-clasping, fawn-coloured.

Hab. Ruahine Mountain-range, east side *Mr. H. Hill*, 1894.

Obs. This species will rank near to *L. alpina*, Sprengel, and to *L. parvifolia*, Col. (Trans. N.Z. Inst., vol. xx., p. 224), and their allies, differing widely, however, in several characters, especially in position and peculiar formation and habit of its fertile pinnae, their superior bases running upwards on rhachis, instead of downwards.

2. *L. alternans*,⁹³⁹ sp. nov.

Plant small, tufted; rootstock ascending, coalescent; roots long, branched, densely clothed with red woolly hairs; fronds (sub 20) erect and spreading, lanceolate, glabrous; stipites very hairy at base, scales dark-brown, long and coarse, shining, $\frac{1}{4}$ in. long, 1 line broad at base, subulate, very narrow acuminate; veins longitudinal, close, coarse; veinlets anastomosing. *Barren frond* pinnatifid,

939 *Blechnum membranaceum* (Hook.) Diels.

membranous, green, 7 in.–10 in. long (including stipe 2½ in.), ¾ in. wide (at middle); lobes alternate, regularly zigzag throughout, oblong-deltoid, tips rounded, midribs ascending, margins undulate subcrenulate with minute callous teeth (3–4–5 together) at tips of veins; veins few, free, distant, and forked, extending to margin, tips clavate, the [617] lower pair not arising from midrib; sinuses short, rather narrow; lobes very small at base, sub 1 line long; apical lobe sub 1 in. long, ovate, tip obtuse; rhachis slender, channelled, colour of frond; stipe stout at base, purple-brown. *Fertile frond* (usually shorter, but some as long as *barren*) ascending, flexuous, very slender (filiform) sub ½ in. wide, pinnate below; lobes very small, distant, and opposite, forming little balls of sori around rhachis, pinnato-pinnatifid above, ¼ in. apart, very narrow, sub 1 line wide, adnate, largely decurrent also current upwards. Involucres narrow, entire, continuous to very tip.

Hab. On slopes near the sea, Weber district, East Coast, County of Patangata: *Mr. H. Hill*; November, 1895.

Obs. This species approaches near to *L. aggregata*, Col. (Trans. N.Z. Inst., vol. xx., p. 223), but differs in several constant characters, apparent on close comparison. It is also naturally allied to some other of our small *Lomariæ*, as *L. lanceolata*, Spreng., *L. membranacea*, Col., *L. pumila*, Raoul, *L. oligoneuron*, Col., and *L. intermedia*, Col. (*loc. cit.*).

Order II. LYCOPIDIACEÆ.

Genus 2. Lycopodium, Linn.

§ III. Leaves imbricated all round the stem; spikes terete, peduncled.

1. *L. decurrentes*,⁹⁴⁰ sp. nov., Col. (*non* Brown).

Plant small, $1\frac{1}{2}$ in. high erect (a single specimen gathered without basal portion), 4-branched, three of its branches being forked, main stem and branches leafy alike, branches sub 1 in. long spreading. Leaves quadrifariously disposed, loosely imbricate, erect and subflexuous, subulate, 2 lines long; tips acute, slightly incurved, dull-green, glabrous and shining; peduncles terminal, slender, erect, $\frac{1}{2}$ in. long, striate, pale, dry, bracteate; bracts linear, subopposite, 2–3–4 together, distant, pale, rather thin; tips obtuse. Spikes solitary, sub 1 in. long, narrow linear, $\frac{1}{10}$ in. wide, brownish. Scales small, peltate, subsquarrosoely spreading, ovate-acuminate, $\frac{1}{10}$ in. long, tips acute, bases rounded and much produced, slightly toothed, thin; the uppermost scales with tips less acuminate, obtuse, dilated, and thin, their lower lateral margins slightly toothed. Capsule narrow reniform, $\frac{1}{2}$ line long, glabrous.

Hab. Ruahine Mountain-range, east side: *Mr. E. W. Andrews*; 1895.

Obs. A species very near to *E. scopulosum*, Col. (Trans. N.Z. Inst., vol. xx., p. 234), and to its allies, as mentioned there. [618]

Order IV. MUSCI.

940 *Lycopodium fastigiatum* R. Br.

Genus 55. *Cryphœa*, Mohr.

1. *C. novæ-zealandiæ*,⁹⁴¹ sp. nov.

Plant tufted, erect, and slightly drooping; dark-green. Stems $2\frac{1}{2}$ in.–3 in. long, leafy from base, branched; lower branches few, distant, sub $\frac{1}{2}$ in. long, each bearing 6–8 capsules; upper branches numerous, close, and very short, subsecund, each with a capsule at apex. Leaves subrhomboidal, margins entire, nerve very stout extending to margin, apex obtuse; perichaetial oblong-ovate, margins entire, very acuminate soon subulate, the subulate portion longer than lamina, tips obtuse; cells narrow linear throughout. Capsule erect, broadly oblong, turgid, slightly sulcate, reddish (so, also, operculum), half concealed by perichaetial leaves; operculum slightly conical from a broad base, depressed, with a rather long acute beak; annulus dark-coloured; teeth exserted, white.

Hab. Ruahine Mountain-range, east side: *Mr. A. Olsen*, 1895.

Obs. A species near to *C. tasmanica*, Mitt., which it much resembles in size, form, and habit, differing, however, in shape of leaves, with their nerve extending throughout, their very blunt apices, and entire margins, as well as in the form of capsule, of operculum, &c.

941 Not found.

**1895 A Description of Three Ferns, believed to
be Undescribed, discovered more than Fifty
Years ago in the Northern District of New
Zealand. *Transactions of the New Zealand Institute*
28: 618-22.**

[*Read before the Hawke's Bay Philosophical Institute,
21st October, 1895.*]

Genus 4. *Trichomanes*, Smith.

1. *T. polyodon*,⁹⁴² sp. nov.

Plant terrestrial, small, tufted, 6–8 fronds, erect, spreading, and slightly drooping, 3–5 in. high (a single specimen without basal end 6½ in., the stipe being 3½ in.), colour darkish olive-green (? from long keeping), with a roughish appearance. Frond ovate-acuminate, 2½ in.–3 in. long, 2 in.–3 in. broad, membranous, bipinnate; pinnæ alternate, close, slightly imbricate, erect, patent, subfalcate, the lowermost pair subopposite, the next pair longest, pinna ovate acuminate obtuse, the inner pinnule [619] longest; segments cuneate, the terminal one large oblong, much lacinate, midrib flexuous branched; veins numerous, erecto-patent, stout, dark-coloured, prominent on both sides, free, venules marginal, sometimes forked at tips, excurrent, mucronate-serrate; rhachises sparingly hairy, not winged, but the upper pinnæ and pinnules slightly subpinnatifid above at axils (*sursum currens*), hairs long slender flexuous; stipe 1½ in.–2 in. long, firm, dry, slender, when young reddish and very hairy, hairs 2–

942 *Trichomanes elongatum* A.Cunn.

3 lines long curved dark-red, fugacious in age. Involucre free, narrow infundibuliform, 1 line long, few, solitary on inner margin of segment, reddish; mouth open, thin, entire or slightly uneven, receptacle stout, sometimes exserted as long as involucre. Rhizome short, stout, very hairy; hairs long, enwrapping, dark, coarse. Roots stout, black, numerous, descending.

Hab. Country between lower Waikato (N.), head of Thames, and Kaipara; 1843–44: W.C.

Obs. This species will rank with *T. elongatum* and *T. colensoi*, but is very distinct from both. Its specific differential characters are good, well defined, and constant; in its peculiar and strongly-marked venation and curiously-webbed axils I know of no other species of the genus, nor of any other New Zealand fern, that approaches it; the cellular structure of the frond is also peculiar, constituting regular and large areolæ.

Genus 13. *Cheilanthes*, Sw.

1. *C. erecta*,⁹⁴³ sp. nov.

Plant small, usually sub 6 in. high (a single specimen among many 8 in.), tufted, erect, light-reddish-brown. Frond linear (scarcely sub lanceolate), obtuse, 3 in.–3½ in. long, 6–8 lines broad; rhachis red-brown, shining, sulcated; stipe 2 in.–2½ in. long, slender, brittle, glabrous, shining, light-brown, slightly scaly, bipinnate or subtripinnate; pinnae 8–10 pairs, distant, opposite, deltoid and subtrapeziform, obtuse, patent and suberect, diverging, thickish, flat, glabrous above, densely

943 Uncertain, possibly *Cheilanthes sieberi* Kunze.

paleaceous-scaly below; veins few, free, dichotomous, obsolete; the lowermost pair of pinnæ smaller than the next and more distant (1 in.) on rhachis; pinnules few, lowermost pair pinnate, each one composed of 3 segments, the two basal segments (or lobes) small roundish, the terminal one deltoid-acuminate and subovate, obtuse; upper segments (or lobes) sessile, opposite, sub-oblong-ovate, falcate, obtuse; apical segments of frond very small. Involucre narrow, membranaceous, continuous, entire and slightly sinuate and finely crenulate. Sori copious, pale, spreading. Scales long, sub-ovate-acuminate, flat, thin, shining, striate, flexuous, spreading, pale-brown, very close, sometimes entirely covering pinna below. The pairs of pinnæ have a peculiar regular 4-angled [620] somewhat semicruciform appearance, with lower pinnules largely diverging.

Hab. Same general locality as preceding; 1843–44: W.C.

Obs. This fern might be just as well placed in the genus *Pellaea*, though its habit is more that of several of the *Cheilanthes* genus; its *primâ facie* appearance is much like *Nothochlæna distans*. It is a very distinct species, and, fortunately, I have several specimens of it.

Genus 27. *Lygodium*, Sw.

1. *L. gracilescens*,⁹⁴⁴ sp. nov.

Plant glabrous, stems long slender numerous, twining and climbing high. *Barren frond*: Petiole slender, patent, 1½ in. long, forked, diverging, each secondary petiole 4–5 lines long, bearing 5 submembranaceous pinnules linear-

944 *Lygodium articulatum* A.Rich.

acuminate $2\frac{3}{4}$ in.– $3\frac{1}{4}$ in. long, 5–7 lines wide, slightly subsinuate, margined, tip subacute, base truncate, sometimes bilobed nearly to base, petiolulate; petiolules 1–2 lines long, filiform, flat above with raised margins, semiterete below; midrib undulating, shining, light-fawn-coloured; much veined; veins alternate, free, 2–3 times forked, extending to margins, stout, prominent on both surfaces; the lowest pair of veins springing from the petiolule, which is largely articulated all round, forming a kind of little cup. *Fertile frond* flat, largely compound, zigzag, divaricate, loose, graceful, variously shaped in outline, generally parallelogramic, 4 in.–5 in. long and nearly as broad, containing 40–100 distinct distant free lobes or small pinnules, patent at right angles, of various shapes and sizes, 3–9 lines diameter, flabelliform, subtrapeziform and subpalmate, largely irregularly laciniate and squarrosely slashed, with more or less of lamina in the centre, and much veined, each on a filiform rhachis or petiolule, finely striate and shining; each pinnule bi- and tri-foliate, when the latter then bipetiolulate with 2 folioles or pinnules springing from a single petiolule, and each distinctly stipitate, and often with two branched midribs from base, largely articulated as in barren frond, each pinnule bearing 20–30 (and upwards) small crowded marginal spike-like clusters at tips of veinlets, subglobular, oblong and turbinate, each cluster or spikelet containing 4–8 sori; involucres glabrous, tips obtuse; capsules smooth, shining, striate; spores white, glabrous. Colour of pinnules rich dark-brown above, glaucous below; of involucres, orange with large black spots.

Hab. Same general locality as the preceding two ferns; 1843–44: W.C.

Obs. This plant has given me some trouble, from its somewhat resembling the well-known New Zealand species, *L. articulatum*, A. Richard. Fortunately, however, I possess [621] Richard's folio copperplate engraving with dissections of that species, and, on a close and prolonged examination and comparison, I find the differential characters to be both clear and constant: I have given them in my rather long description. I also possess good drawings with dissections of several other species, as *LL. flexuosum*, *dichotomum*, *javanicum*, *scandens*, *volubile*, and *reticulatum*, all differing.

The history (so to speak) of these three ferns is somewhat peculiar, and therefore may be briefly narrated.

In my preparing a paper recently for our society, "On the Tin-mines and Mining of Cornwall" (England), I recollect that I possessed a collection of minerals—tin and copper, lead and iron ores—that I had received from Home in the early days (somewhere in the thirties), but I did not know in which of my old unopened cases to find them. On opening one at a guess, I found it was not the one that I wanted, but it contained a heterogenous lot of all sorts—"odds and ends," pamphlets, letters, small boxes, and Maori curios, and several specimens of dried plants still in very good condition, although they were certainly more than fifty years old, the box having been packed by me in 1844, on leaving the Bay of Islands for Hawke's Bay, and not since opened. Among those specimens were these three ferns (with several others—known ones), and a few Phænogams. I have endeavoured

to recollect the exact localities where I had met with them, but in vain. Yet, while such is obscure, from some other specimens put up with them, as *Adiantum aethiopicum*, and *Grammitis leptophylla* (*G. novæ-zealandiæ*, Col.), both in great plenty, whose special habitat I well remember—between Auckland and the head of Manukau Harbour—and also from specimens of *Alseuosmia banksii* and *Pennantia corymbosa* (all then rare with me at the north), I know that these three ferns here described must have been also found in that country or district named—and probably near the end of my long journey overland from Hawke's Bay to the Bay of Islands in the years 1843–44. Moreover, on my arrival there in February, being beyond my fixed time, and having very much of other and far different matters to attend to, those specimens were put aside and forgotten.

Further, I cannot but believe that specimens of these three ferns must have been again met with during the last fifty years by the many fern-collectors and amateurs in that now well-known district, and, if so, probably placed under other and allied species—as *Trichomanes* under *T. elongatum*; *Cheilanthes* under *C. tenuifolia*, or *Nothochlæna distans*; and *Lygodium* under *L. articulatum*—as there is a kind of family resemblance between them at first sight and without close [622] examination which might suffice to class them as varieties of those well-known and allied species.

In fine (and as it is very likely I may never again have the opportunity of describing any more of our New Zealand ferns), I would venture to repeat what I wrote last year respecting the proper study of ferns, believing such to be

absolutely necessary in arriving at a just conclusion concerning them: "I have long been of opinion that greater scrutiny should be given by pteridologists (not mere amateurs, fern-growers, and collectors) to the scales of ferns—their form, consistency, venation, colour, and structure. Nature is ever great, true, and constant in what men term *small* things." (Trans. N.Z. Inst., vol. xxvi., p. 400.) In so saying I merely re-echo the opinions and words of two of our most eminent British pteridologists—Sir W.J. Hooker, formerly the director of the Royal Botanic Gardens at Kew, and Mr. John Smith, for forty years his able and intelligent curator of ferns there, and also author of several useful works on ferns. And with these words of Sir William Hooker's (used in describing one of our New Zealand ferns—then, as *Polypodium attenuatum*, but now, and correctly, as *P. cunninghamii*) I close my paper: "The nature of the *venation* is of the highest importance in the study of the ferns—sometimes for discriminating species, and not unfrequently for distinguishing genera" ("Icones Plantarum," tab. CDIX.).

1896 Presidential address.

Transactions of the New Zealand Institute 29: 129-150.

[Delivered to the Hawke's Bay Philosophical Institute,
11th May, 1896.]

Slave to no sect, who takes no private road,
But looks through Nature up to Nature's God.

POPE, "Essay on
Man."

In my taking the President's chair on this occasion, being the opening of our sessional meetings for this year, 1896, I must, in the first place, thank you for your having again elected me to this office. And while it is my pleasing duty to do this, and to assure you I will do my best to fill it creditably, I feel a certain amount of diffidential fear lest I may fail, and so not come up to what you may have been led to anticipate; and this arises from many peculiar circumstances, which I need not particularise.

From the published report of our Council for the last year's session, which you have seen, I find there were seventeen papers on various subjects read here by members of this auxiliary branch of the New Zealand Institute during that period. As the last annual volume of Transactions published by the Institute has not yet been received by us, we do not at present know how many of those papers may, have been selected for publication in it; I hope, however, that our [130] society will shortly find that, if not all, a fair proportionate number will have

again passed the scrutinising ordeal of the Governors and Director of the Institute.

I confess I would much rather have seen the expected annual volume of the Transactions, as from it we should have learned the number, the variety, and the quality of its papers—contributions from members of the New Zealand Institute scattered throughout the colony. And these papers, or some of them, in brief review I might with pleasure now bring before you, just to show the working of the united society during the past year, and not unlikely serving to stimulate this branch of it to greater exertions.

I have also noticed in our Council's report, just adverted to, that the number of papers read, with the President's opening address and a lecture delivered, were, at least, increased in number above those of the preceding year. As I have said before, speaking from this place, so say I now again, that I should like to see a much larger number of papers, both suitable and interesting, and on various subjects, annually introduced. Moreover, I think it is high time for some, at least, of our older members, who have been so many years in our ship as to have quite served their full term of apprenticeship, to come to the fore and perform their share of duty, if not in the work of papers, yet in the collecting and preserving of specimens in any and every branch of natural science for the museum. And here I will quote a paragraph from my last presidential address from this chair, it being still so very suitable:—

“There is yet another prominent feature in our last report in connection with the relatively fewer number of papers read here during the session of 1887—viz., the still

greater paucity of their writers. This, however, should not be, as it throws the working of our ship upon a few hands only; and this, if continued, will surely bring about, not a mutiny, but the stoppage altogether of her sailing. For, in my opinion, this branch of the New Zealand Institute will droop and wither and die if it becomes, unfruitful. The ordinary meetings will not continue to be held unless there are original papers to bring before the members; and if this should happen, and consequently no papers from the Hawke's Bay auxiliary appear in the annual volume, then the large number of country and other members, who, from their residing at a distance, are precluded from attending the ordinary meetings, will cease remaining subscribers. In this ship or hive there should be no drones. Our society is both smaller and poorer than other kindred ones in this North Island—Auckland and Wellington. Happily there is no distinction made on this account; nevertheless, we here in Hawke's Bay must feel it, [131] and therefore it is the more imperative upon us, as a determined and devoted though small band, devoid, of those large blessings which our elder sisters enjoy—in rich endowments, princely gifts, resident learned scientific men, extensive libraries and museums—to be active, to be penetrated with that genuine *esprit de corps* which not infrequently more than makes up for the want of everything else. In particular, let the very proper and praiseworthy spirit be shown in your attendance here on the regular nights of meeting—coming, too, in time for the fixed hour of meeting, and also in upholding the proper status of our young society—I mean the carrying-out all the standard rules in their integrity, particularly Rule 3, which, I think, was too

often infringed on during the last year's session: I mention this as I have plainly perceived that, if care is not taken, our ordinary meetings are apt to degenerate into those of a low debating-club (*Facilis descensus Averni*⁹⁴⁵); and so we cease to remain an auxiliary branch of the New Zealand Institute—a society founded for a highly different purpose."

And here I think I should remind the members of our Institute, that original papers written by other than members themselves may be received and read at our ordinary meetings. Such papers, of course, must be introduced by a member. It would be well for our members to bear this liberal manner of acting in mind. During this last session three papers of this class were read here, written by non-members, and I thank the writers.

Closely connected with the number of papers read is the present number of our members; and I deeply regret to find their number is slowly and sadly decreasing. This ought not to be. Last year our report informed us of "a considerable decrease in the membership, which then stood at eighty-four, the smallest number on the books of the society for many years past." This year the new report gives the remaining number of them as seventy-four, four having resigned and two died, to which, however, six new members have to be added, making the present total of members eighty. Fairly considering the great, the important value of such an institution as this, especially in a newly-settled country, and, with special reference

945 "the descent of Avernus (is) easy" (Virgil, "*Aeneid*," VI. 126); ie, it is easy to slip into moral ruin.

thereto, the great number of educated youths yearly leaving school, one is tempted to ask, Why is it that so few of them are found here with us—if not as enrolled members and co-workers, yet as visitors of our museum and library, and hearers at our stated meetings, which are now thrown open to the public? Is it so, that out of those many youths and young men, several of whom gained high prizes, at the various school-examinations, and of whose future career high hopes were entertained, there are none to be found in love [132] with nature and natural science in all its varied forms, so as to continue and carry on those studies begun at school? Our youth are the hope—the strong hope, the backbone—of this young and rising colony, destined in due time, under God's blessing, to become a great and mighty nation, or a fair and flourishing portion of a still mightier empire, and therefore they should be seeking to grow, to improve, in knowledge and wisdom. Nothing is more sure than this: that school knowledge and attainments allowed insensibly to wither and rust soon become *forgotten*; and, once forgotten, are seldom, if ever, found again. There is a law in nature according to which success is proportioned to the labour spent upon it, both in kind and in degree. Success is attained in kind, for what a man soweth that shall he also reap; success is also proportioned to labour in degree, for he who studies much will have more than he who studies little. In almost all departments it is the diligent hand which maketh rich. And here let me, not only as your elected President *pro tem.*, but as a very old man of some understanding in these matters, and therefore speaking from experience—let me proffer a little sound advice.

The powerful and active enemies of science and of general learning (especially here in the colony) are too great love of holidays and of idleness, of frivolity and of fleeting pleasures, which yield no enduring satisfaction; which generally, if not invariably, look for more, never being satisfied, and mostly leaving “an aching void.” And should there be, before the final close, a few hours or days free from pain and extreme weakness for reflection, then the sad heart-rending vista presents itself of *time lost*, of noble, almost god-like faculties abused, of a wasted life! Our classical British poet, Thomson, might well exclaim, while meditating on such scenes:—

Where now, ye lying vanities of life!
 Ye ever-tempting, ever-cheating train!
 Where are you now? and what is your amount?
 Vexation, disappointment, and remorse.
 Sad, sickening thought! and yet deluded Man,
 A scene of crude disjointed visions past
 And broken slumbers, rises still resolv’d,
 With new-flush’d hopes, to run the giddy round.

(“Winter.”)

And heartily wishing well to the scholars and youth and young men and women of Hawke’s Bay, I would yet add a few more words by way of further illustration, and with the hope of raising thought.

In student-life there are those who seek knowledge for its own sake, and there are those who seek it for the sake of the prize, and the honour, and the subsequent success in life that knowledge brings. To those who seek knowledge for its own [133] sake the labour is itself reward.

Attainment is the highest reward. Doubtless the prize stimulates exertion, encourages and forms a part of the motive, but only a subordinate one, and knowledge would still have a “price above rubies” if there were no prize at all. They who seek knowledge for the sake of a prize are not genuine lovers of knowledge. They only love the rewards of knowledge; had it no honour or substantial advantage connected with it they would be indolent. It is a spurious goodness which is good for the sake of reward. The child that speaks truth for the sake of the praise of truth is not truthful; the man who is honest because “honesty is the best policy” has not integrity in his heart. Would that the parents of families here in Hawke’s Bay could be brought to duly consider this, and to perceive the great and lasting advantages and benefits and true pleasures arising from the following of Nature and her manifold teachings, and so direct and lead their progeny into something better than the low frivolities and transient pleasures and waste of time of the present age.

For, believe me, there is a rapture in gazing with a trained eye on this wondrous world. Let us not deprecate what God has given. The highest pleasure of sensation comes through the eye; she ranks above all the rest of the senses in dignity. He whose eye is so refined by culture and discipline that he can repose with pleasure upon the serene outline of beautiful forms has reached the purest of the sensational raptures. There is a joy in contemplating the manifold forms in which the All-beautiful has concealed His essence—the living garment in which the Invisible has robed His mysterious loveliness. In every aspect of nature there is joy; whether it be the purity of virgin morning, or the sombre grey of a

day of clouds, or the solemn pomp and majesty of night; whether it be the chaste lines of the crystal on the yonder Ruahine Mountain-range, or the waving ever-changing outlines of distant hills (as those south beyond Havelock and north towards Wairoa) tremulously visible through the slanting rays of the setting sun; the minute petals of the New Zealand daisy, or the overhanging forms of mysterious ancient forests: it is a pure delight to see. I hope a better day is at hand for our Government schools, when Education Boards (if existing) or Committees (when formed of proper literate men) will pay full attention to this one great qualification, or main desideratum, on the part of teachers seeking situations—viz., their love for natural science and for scientific study, and their aptness to teach such both out of school as well as in school. Such a teacher in a country school would prove a real blessing to the youths under his care, and be a great means of keeping them from degenerating on leaving school, as well as [134] preserving them from “larrikinism.” Scientific study should be largely inculcated by kind and plain words, by manuals, and by example, for science has extended into all portions of life. What I mean by a scientific education is not the mere confined knowledge of that one branch taught, or one thing brought more particularly under consideration, whether Euclid’s problems or natural science—the science of living things, as seen in the wondrous, complex, yet perfect and beautiful structure of a fly, a shell-fish, or a moss (for beauty’s best in unregarded things)—the mention of which as a useful study is too often met with a “*Cui bono?*” For the opinion is often expressed that certain scientific pursuits are not

compatible with the business pursuits of life. But there is no greater fallacy than this, as we may see in the living instances of many eminent men of our time — Sir John Lubbock, for example. A true scientific education is the teaching of the power of observing, the teaching of accuracy, the difficulty of attaining to a real knowledge of the truth, and the methods by which one may pass from that which was proved to the thought of that which was also capable of being proved. The first thing to learn is the power of observing, the power of seeing things in their relations to other things, and the modifications they might undergo. This, though a rather difficult thing, is attainable. Science teaches not only how to observe, but how to record facts, and how to arrive at general conclusions upon facts. The habit of accuracy which science inculcates makes a man accurate in the ordinary business and pursuits of life. There are many people—good people—who would not tell a lie, but for their lives they seem as if they could not tell the exact truth. Now, science teaches the difficulty of attaining truth, and shows how to arrive at it. It is said of the celebrated John Hunter, who delighted in plain language, that he once said, if he wished to sum up his advice to students it would be, “Don’t think; try.” What he meant was, when one was satisfied about certain principles, do not think that you can think what must necessarily follow, but try, test, experiment, observe, record facts, then you would see whether what you thought was true was really true.

Moreover, scientific processes also gratify our love of novelty, of wonder. All have an insatiable appetite for the wonderful; civilised man is still everywhere like the Athenians of old, eagerly inquiring after “some new

thing." And to a certain extent (if, indeed, such should ever be limited) this common trait is conducive of great good, as, in spite of many failures, it continually leads to the advancement of our race.

I have already barely mentioned the death of two of our members. As, however, this is unusual with us, I would offer a few observations concerning them. Those two gentlemen, [135] Mr. F.H. Meinertzhagen and Mr. H.S. Tiffen, were old and valuable members of our Institute; both of them were original members from its foundation in 1874 (when lovers of natural science were few who joined us), and these require a special brief notice.

Mr. Meinertzhagen resided for several years at Waimarama, a little south of Cape Kidnappers, where he carried on his natural science investigations, and from him I received several letters and specimens, and also interesting letters from London after his leaving New Zealand. He early became a life member, paying the £10 fee—and here I may remark that at the same time, or, rather, for ten years preceding, he was also a member of the Auckland auxiliary branch, of which society he was also a life member. This double membership, with their expenses, and not being able to attend any of our meetings owing to the distance of his residence from Napier, shows his appreciation of natural science and of our New Zealand Institute. A paper of his on a new species of *Aplysia* will be found in the "Transactions of the New Zealand Institute," vol. xii., p. 270, which also further indicates his modesty and kindheartedness.

Mr. H.S. Tiffen also was one of the founders of our society. Although he wrote no paper for our meetings, he

was always a warm supporter of them, while his beautiful and extensive garden, greenhouse, hothouse, and ferneries were always cheerfully open at our service. From the ferneries especially, containing such a large and varied collection of both foreign and native ferns, both Mr. Hamilton (our late curator) and myself have derived much valuable, true, and living information with specimens. Mr. Tiffen, being a devoted lover and disciple of Flora, introduced a large number of flowering-plants, shrubs, and trees from various parts of the globe regardless of expense, his flower-garden, the admiration of visitors and tourists, being the best one in Napier, if not on the whole east coast of New Zealand.

Our society being a branch of the New Zealand Institute (and bearing in mind the ancient, natural, and instructive Roman fable by Menenius Agrippa to the mutineers, of the body and its members, "Livy," ii., 32), I should not omit to bring to your notice, with all due respect, the death of another member of the New Zealand Institute, one of the first scientific men, if not the earliest resident pioneer of science, in New Zealand—the late Hon. W.B.D. Mantell, M.L.C., F.G.S., &c., with whom I was always most friendly acquainted. Mr. Mantell, although not a member of our branch society, was a member of the Wellington auxiliary branch from its beginning, and also one of the founders of the still earlier Wellington Philosophical Society, and one of the nominated [136] governors of the New Zealand Institute from its creation in 1867. Mr. Mantell arrived in New Zealand in 1840, and worked hard and long in the pursuit of natural zoological science, especially in the collecting fossil osteological remains of those many kinds of enormous

land-birds (once common in New Zealand, but long extinct) popularly known by the name of *moa*, though now separated into several distinct genera by the aid of still more extensive and perfect modern acquisitions, obtained from all parts of the colony, in which scientific work I may also (and with pleasure) mention the name of our former respected and indefatigable secretary and curator, Mr. Augustus Hamilton, of whose loving zeal and assiduity and knowledge our museum bears ample testimony. Indeed, the closing word of Sir Christopher Wren's epitaph (the architect of St. Paul's) is equally applicable here to Hamilton—"circumspice."

And, having made that little digression, I may here fitly quote, from a late paper of mine touching on the moa and Mr. Mantell (read before the Wellington Philosophical Society in 1892), what Dr. Mantell, his father, had published respecting the first lot of moa-bones he had received from his son in New Zealand. The Doctor says, "The first collection sent to England by my son in 1847 consisted of nearly 900 specimens; I gave Professor Owen the exclusive privilege of describing them."⁹⁴⁶ I feel the more inclined to relate this circumstance as being an apt illustration of the pursuit of knowledge under difficulties, and as an encouragement to our young men of this generation and district to "go and do likewise."

Before, however, I quit this sad subject there are yet two more names I would bring before you from the long and mournful death-roll of men of science in 1895. The first is that of the Right Hon. Thomas H. Huxley, LL.D.,

946 WC: "Status quo": *Trans. N.Z. Inst.*, vol. xxiv., p. 472.

F.R.S., and P.C., who died in June last. Mr. Huxley was also an honorary member of our New Zealand Institute, having been elected so long back as 1872 (together with Sir George Grey, in that year). He had also been out here in the southern seas as assistant-surgeon on board H.M.S. "Rattlesnake," on a surveying expedition in Torres Strait. During his four years' cruise and service on board the "Rattlesnake" he wrote several scientific papers, which were sent home by him to England, and published during his absence. I well remember this ship, with Captain Hobson (afterwards our first Governor), in 1836, at anchor in the Bay of Islands; and mentioning this serves to bring vividly to mind our distinguished New Zealand botanist Sir J.D. Hooker, who had also filled a similar official situation on board [137] H.M.S. "Erebus," which ship (together with the "Terror," her consort, forming the antarctic expedition), wintered in the Bay of Islands in 1841. Though Mr. Huxley has not been, particularly connected with New Zealand matters, yet of him it may be also truly said, as of the great navigator Captain Cook, he is "the man of all countries, all peoples, and all times." Several other good reasons I certainly have for bringing his name before you on this occasion arise from the facts of his having long been a member of the Royal Society—and at one time its President—and of the determination of the Committee in London to erect a suitable memorial to his memory, to be placed with those to Owen and to Darwin in the Natural History Museum, South Kensington; and of the Committee writing to me (as a member of the Royal Society) and to others of us here in New Zealand to consent to have our names placed on the Committee-roll, and further to assist in this great national

work; and especially from the fact of Mr. Huxley having been actively engaged down to the last hours of his life in promoting the superior and free education of youth in the colonies. From official papers lately to hand I find that at the first meeting of the Committee their list, with His Royal Highness the Prince of Wales at the head, included more than seven hundred eminent names, many of them being distinguished foreigners. The closing sentence from the speech of the President, Royal Society, Lord Kelvin, who proposed the first resolution, I may briefly bring before you: "His moral lessons from his biological work extended even into the field of politics, and his contributions to thought in respect of theology in themselves are such as to put Huxley's name and fame in a very high position indeed, as a man thoroughly determined to give all the benefit he could to mankind—as a worker who gives his life, who sacrifices his health, who sacrifices his time, who gives up everything for the advancement of science; but, as he tells us himself, with an object which he felt to be even greater than the advancement of science, the promotion of the welfare, moral and material, of mankind—who deserves a memorial or a monument better than Huxley?"

Lord Playfair also, in supporting the resolution, said, "It is scarcely necessary to say one word in regard to the eminence and the scientific position of Professor Huxley; but it has been my privilege to be associated with him in many of his undertakings and labours as a public man.... In higher education the Scotch University Commission benefited by his wise counsel and breadth of culture. The present position of technical education also owes much to the advocacy and the scientific lectures which Professor

Huxley gave through the country. There is one labour in [138] which to the time of his last illness I had great pleasure in being associated with him—that was, in the establishment of scientific scholarships of £150 a year in almost every college and university, not only in the United Kingdom, but in the Empire of India, and throughout all our colonies. That was a subject very dear to Professor Huxley's heart.... He was a much-valued adviser in all matters relating to the establishment of these scholarships. They are all research scholarships, and are now exercising a benign and important influence over the science education of our great empire."

And our old, well-known, and staunch New Zealand friend, Sir J.D. Hooker (chairman of the provisional committee), in moving the second resolution, said, "We both entered the public service as assistant-surgeons and volunteer naturalists in the royal navy. Before Professor Huxley went out in the "Rattlesnake" the choice lay between us for the appointment to that vessel, and, fortunately, the choice fell upon him. Immediately upon his return a strong friendship sprang up between us, which has lasted forty-five years, throughout which he has been one of my staunchest and firmest friends. This friendship has affected me through life, and I owe a great deal of my success in scientific life to the advice, the stimulus, and the example which Professor Huxley set me during a long career."

Here must end my quotations. I believe that circulars respecting this great national movement have been sent to some of the members of this Institute, and to several other residents here in Napier and Hawke's Bay, by

Professor T.J. Parker, F.R.S., of Dunedin, which is another good reason for my bringing this subject before you.

The second name is another of literally world-wide fame—Louis Pasteur, who passed away from us in September, 1895. Fifty years ago, before he entered on his grand biological work, Pasteur made a discovery of first-rate importance in physics and chemistry—the formation of crystals. For ten years he was chiefly occupied with researches related to the subject of that great discovery. Near the end of 1857 he entered on the line of research to which he devoted the rest of his life, and by which he conferred untold benefits on humanity and the lower animals. Helmholtz had in an earlier work proved almost to a certainty “that the actual presence of a living creature [“vibrio,” as he called it; “bacterium,” as we more commonly call it now] is necessary for either fermentation or putrefaction.” Pasteur gave complete demonstration of that conclusion, and early expanded it to vast and previously undreamt of extensions of its application. From Pasteur’s discoveries, Lister was led to work out the principles of antiseptic surgery, the practice of which he commenced in the Glasgow Royal [139] Infirmary in 1865. Having been led to trace microbes as the origin not only of fermentation and putrefaction, but of a vast array of destructive blights happening to plants and animals—vines, silkworms, birds, cattle, and mankind—Pasteur was forced to take up the question, as of supreme importance, “Whence came these microbes, and what are their antecedents?” We are sometimes told, “from warmth and moisture”—and this, too, in scientific journals of 1895, under the more learned name, perhaps,

of “abiogenesis,” or the fortuitous concourse of atoms! Without wasting words to prove theoretically that while stones falling together may, as we all believe they have actually done, make a solar system with a habitable planet or planets, they cannot make a man, or a microbe, or an organic cell, with its property of heredity. Pasteur set about practically to trace the antecedents of every microbe he met with; and he found for it in every case a living thing, whether in the air, or in water, or in earth. During nearly all the latter part of his life, and to the end, Pasteur devoted himself to biological research, and to vigorous practical realisation of its benefits for the world. And we here, in this far-off colony, are receiving benefits from Pasteur’s labours and discoveries. I have felt constrained to say these few words in honour of that great chemist and biologist.

And now for a few words respecting some of the higher scientific discoveries of the past year. To this subject, however, I can only make very scanty allusions; but this is a small matter, as you have already heard of them from better-informed sources.

Probably the discovery of a second gas as a component in our common atmospheric air stands pre-eminent. I allude to helium; its great ally being argon, also lately discovered by Lord Rayleigh. Then there is anti-toxin, as a remedy in certain forms of severe disease; and more lately the curious and highly-important discovery by Professor Röntgen of photographic rays, or the “new light,” by which near objects unseen by mortal eye, through their being imbedded and hidden in opaque bodies, are made clearly visible. This interesting

discovery, which is likely to become very serviceable in some cases of surgery, has already attained a high position in the medical world, especially on the Continent of Europe. Indeed, we are continually receiving notices from abroad of fresh and further useful and surprising discoveries being made in this direction. I shall be able to show you a plate as an object-lesson representing its operation, which will cause it to be the more readily understood. But I do not exactly fall in with the statement so commonly made in connection with this important discovery—that the camera of the photographer can now [140] make clear and plain what is invisible to the naked eye—that is, as if the naked human eye at its highest standard was the acme, the *ne plus ultra*, of vision. For such use of photography has long been known—at least to astronomers; for hundreds of stars, some of great magnitude, yet invisible through the best telescopes, are made known to us thereby, and have been correctly mapped.

Moreover (and without entering on the wonderful and complex and perfect physical mechanism of the human eye), we may see in the animal kingdom, especially in the class of birds, how vastly their powers of seeing exceed those of man. Let us briefly consider this, as it contains an immense field for interesting and pleasurable thought, and some of the objects are common, near at hand, and easily comprehended—omitting the well-known owls, with their strong nocturnal powers of vision far surpassing that of man. Take, for instance, the common Maori kingfisher (*Halcyon vagans* = Kotaretare). I have watched this bird, or the pair of them, at the season of rearing their young, quietly perched on

an outstretched dead branch of a lofty timber tree overhanging a streamlet, 50 ft.—60 ft. high, when suddenly, like an arrow, the bird descends into the water below, and immediately emerges with a tiny fish in its bill. So, also, I have at other times noticed them to act on a cricket, beetle, or lizard in the grass and low herbage. A still commoner show of the superior sight of birds, even when on the wing soaring on high, is also everywhere around us exhibited—over land by the hawks discerning a mouse running among the fern, or a young duckling or other water-bird among the long sedges and rushes of the swamps; over the sea by the various species of gulls and terns, who, notwithstanding the rippling and the colour of the water, descend with rapidity like a leaden ball beneath the wavelets, and arise with their prey. But all this is yet surprisingly surpassed by the giant vulture—the condor of the Andes. Here I will, with pleasure, quote the natural and admirable words of Darwin, who had so frequently witnessed them in their natural haunts: “The condors may often be seen at a great height, soaring over a certain spot in the most graceful circles. On some occasions I am sure that they do this only for pleasure, but on others the Chileno countryman tells you that they are watching a dying animal, or the puma devouring its prey.... When an animal is killed in the country it is well known that the condors, like other carrion-vultures, soon gain intelligence of it, and congregate in an inexplicable manner. In most cases it must not be overlooked that the birds have discovered their prey, and have picked the skeleton clean, before the flesh is in the least degree tainted.... Often when lying down to rest on [141] the open plains, on looking upwards I have seen the condors

sailing through the air at a great height. Where the country is level I do not believe a space of the heavens of more than 15° above the horizon is commonly viewed with any attention by a person either walking or on horseback. If such be the case, and the condor is on the wing at a height of between 3,000 ft. and 4,000 ft., before it could come within the range of vision its distance in a straight line from the beholder's eye would be rather more than two miles. Might it not thus readily be overlooked? When an animal is killed by the sportsman in a lonely valley, may he not all the while be watched from above by the sharp-sighted bird? And will not the manner of its descent proclaim throughout the district to the whole family of condors that their prey is at hand?" (Darwin's "Naturalist's Voyage," pp. 183–186; a book that should be in the hands of all our rising youth.)

Still, while we here see the enormously superior powers of unaided vision as shown by birds, man, too, not unfrequently exceeds that of the common human powers of range, of which I myself have known instances in New Zealand, and therefore am inclined to relate them. In former years I have satisfactorily proved this, in viewing with my telescope the planet Jupiter, and also the cluster of stars called Pleiades in the constellation Taurus, when I found that the Maoris could see more stars in the Pleiades with the unaided eye than I could, for, while I could only see clearly six stars, they could see seven, and sometimes eight. This feat has also been done at home in England, though very rarely, some few there having distinguished as many as twelve stars. This cluster has been mentioned in poetry as far back as Hesiod, B.C. 900 (contemporary with Homer), who alludes to them as the

Seven Virgins. In the ancient MS. of Cicero's "Aratus,"⁹⁴⁷ preserved in the British Museum, the stars are named Merope, Alcyone, Celieno, Electra, Maia, Asterope, Taygeta. Though they have ever borne the name of the "seven stars," yet to ordinary eyes six only are visible. My reason for mentioning this ancient astronomical MS. of the third or fourth century is that I happen to have a copy of it with a *facsimile* of the faces of those seven virgins which I think will interest you.⁹⁴⁸ To return: the Maoris also could clearly distinguish and point out with the naked eye the satellites or moons of Jupiter, with their respective and changing positions.

In botany (having read two or three papers containing descriptions of some newly-discovered New Zealand plants before the Institute during the last session. which I hope may [142] be published in the forthcoming volume) I shall merely call your attention to two recent noticeable successes in the cultivation of remarkable plants in our colonies; one being that of the date-palm (*Phoenix dactylifera*) in the West Indies (Antigua), where it now bears ripe fruit, and, no doubt, will ere long become an article of commerce; and one being the magnificent water-lily (*Victoria regia*) of the River Amazon, that has lately flowered at Sydney, though many years ago (1849–50) it flowered in its big tanks at the Royal Gardens, Kew, and also in the private gardens of the Duke of Devonshire and the Duke of Northumberland, when it was fully described by the late Sir William Hooker. (Of this remarkable plant I hope to show you by-and-by some

947 WC: "Aratus," Greek Astronomer, 277 B.C.

948 WC: "*Archæologia*," vol. xxvi., art. iii., p. 47.

large coloured drawings from Sir W. Hooker's magnificent work, together with some interesting extracts from the writings of its fortunate early discoverers.)

I have especial reasons for calling your attention to the date-palm, it being one of the oldest-known cultivated plants yielding food for man; its fruit is also well known here. This plant and the banana, *Musa sapientum* (of which I read a paper here two years ago),⁹⁴⁹ are the only two prehistorical fruit-producing plants. The date-palm flourishes in Egypt, Nubia, Morocco, Persia, and Arabia, and even India, and is now, as ever, commonly used by a very large number of mankind, and that, too, in its native country, in a far more economical and useful manner than it is here by us, we only eating the fleshy part of the fruit, rejecting the hard seeds or stones, which are also used by the Arabs for food; for, hard and dry as they appear, they are ground into a kind of coarse meal, on which the goats and camels feed with greediness, and in the longest marches across the desert neither man nor beast require other food, if they have also a little water or camel's milk to allay their thirst. And, as the banana has of late years been naturalised and extensively cultivated in some of our British colonies, and thus become an article of commerce, so, it is hoped, in due time the date will also be: Although the date-palm is frequently mentioned in the Bible (particularly in the Old Testament), and always with approval, yet, curiously enough, there is not an instance of its being spoken of as producing a fruit valued as a food for man.

949 WC: *Trans. N.Z. Inst.*, vol. xxvi., p. 334.

I should not pass unnoticed two great events of this present year, which have been much talked of, one being natural and sure, and one dependent on the hardihood and ability of man. The former is a remarkable total eclipse of the sun, which will take place on the 8th–9th of August, but, unfortunately for us, will not be visible here in New Zealand. Its [143] appearance will commence about two hundred miles north of Scotland, out at sea, and will cease on the Pacific Ocean at 180 degrees of east longitude and 20 degrees north latitude. Though invisible here, I mention it for two reasons: (1.) It is exciting active scientific consideration at Home and throughout the old civilised world, so that great preparations are being made for the proper observation of it. Some months back the "Norse King," a large steamer of 3,000 tons, was chartered to take an astronomical party to Vadso, in Nova Zembla, in order to observe this eclipse; while similar arrangements will also be carried out for Japan. On this occasion two instruments will be used, one called a cœlostat and the other a heliostat, their purpose being to deflect the rays of the object into a fixed telescope, instead of having to put the telescope itself into motion. The importance which attaches to the investigation of the sun during eclipses is very great, for it is only at these times, and during brief occasional opportunities, that knowledge of its physical construction and conditions can be obtained. It is only when the brilliancy of the flood of light which emanates from its whole surface is shut off from our eyes by the intervening moon, and we are left in the darkness of the lunar shadow, that we are able to see the corona radiating from the vast orb, and here and there within its zone the remarkable outburst of

still more luminous combustions—certain brilliant star-like points, commonly called “Baily’s beads,” and irregular flame-like protuberances on the dark edge of the moon, usually of a pink or rose colour. Although solar eclipses are annually in greater number than lunar eclipses, they are more locally distributed, and, whilst the shadow of the lunar eclipse rests over a full hemisphere, the solar eclipse is a mere streak on the earth’s surface. Hence the necessity for expeditions of observers. And (2) to tell you what I have myself observed, in a small way, with reference to the corona radiating from the sun, or, more particularly, those irregular flame-like projections, but not during an eclipse. During several years, in the month of December, and about the middle of it, or on or near to our longest day—the 21st—I have been employed in watching with my glass the sun at sunset and seeing it descend south-west beyond the Ruahine Mountain-range, about fifty miles distant, when two things I have noticed—one being a kind of corona or areola, with long, attenuated, red flames, ever changing, proceeding from its margin (much as the sun is represented in drawings of it when eclipsed), and one an abrupt bare rock or broken precipitous crag on the crest of the mountain standing out in bold relief and black shade in front of the sinking orb. These interesting sights are only to be seen for a few evenings, owing to the daily change in the apparent position of the sun traveling [144] a little more either to the north or to the south, as the case may be,—which is also so clearly shown by the bare, perpendicular edge of the rock on the crest; and I think that those red, flame-like emissions are at these moments seen owing to the intervening dark mass of the mountain-peak or -crag,

which occupies a similar though smaller position to that of the dark body of the moon during a solar eclipse. Of course the whole solar object is only that of the image of the sun correctly reflected in the clear atmosphere above, and lasting but a very short time. I may mention that I had to pay a little for my temerity in looking steadily at such a bright object without using a coloured glass, for during some time after so observing it whatever I looked at wore a greenish-yellow hue, some objects, owing to their natural colours, being rendered disagreeable. This, however, gradually wore off. I think I have observed this pleasing natural phenomenon during four or five years, but not consecutively, owing to the sky being sometimes clouded at sunset. I have often thought of writing a short paper concerning it, and giving sketches of its appearances; one of them I now lay before you, made, however, mainly from memory. Other persons, no doubt, in days to come will also have the pleasure of observing this peculiar spectacle from this spot on Napier Hill.

And here I cannot refrain from expressing my belief—notwithstanding the enormous and wonderful advances the true knowledge of astronomy has made of late years, almost (to use a well-known colonial phrase) “by leaps and bounds,” and, also, how very much of this superior knowledge is now commonly and daily taught in our public schools—that many—too many—of our rising generation are really no better off, no farther advanced, for all this imparted and surely-grounded scientific knowledge than the ancients were when they firmly believed that the glorious starry heavens above them were just as a fixed glass (or metal) dome over their heads, and the stars placed there as twinkling lights to

give light by night to the earth, which earth, moreover, with its contents, was also the principal part, the chief, of all creation, or of the universe.

Without expatiating on the wonders of astronomy or the knowledge of the stars—on the grand, far-reaching, and captivating subject of the immensity of space; its gloriously never-ending infinitude, and the hundreds, yea thousands, of stars—other worlds, never yet seen by mortal eye, which even our best telescopes do not—cannot—reveal, yet the more modern science of photography has faithfully made known and fixed—I would briefly and in plain words mention a few of the more striking heads of this branch of science, which perhaps are but little known or considered. [145]

(1.) The large and ever-increasing number of planets now known—nearly two hundred—as compared with the small number known to the ancient astronomers (six or seven with the moon); most of them also having been discovered during this century; each planet, like this globe of ours, correctly and everlastinglly pursuing its uniform course in its own proper orbit around the sun in the solar system, without the least deviation therefrom.

(2.) The incalculable number of stars as of late years revealed by their (so to speak) thickness in depth, the same having been to some extent gauged. And, as I wish you all to clearly understand me, let me endeavour to put this term into plain language. Suppose our great New Zealand forest began here on the very edge of the sea-shore in Hawke's Bay and extended thence fifty miles over yonder plains to the base of the Ruahine Mountain-range, or even over a continuous flat country to Cook

Strait; and suppose a boat landing for the first time here on the beach, and officers and men going up to the margin of the said big forest, they could only see the outside trees forming its margin, or, at most, a very little way into the forest; and now, supposing further a straight road was cut from the entrance right on to the farthest end of the said forest; and now look along this far-extending vista through the trees with a glass, and for the first time the beholder would know something more of the expansion—of the thickness, of the depth, of the multitude—of trees of the forest before him. Well, just so it is with the stars. These which we see on the clearest nights are but few in number in comparison with those others unseen by our eyes lying far beyond them, but which, as to depth and thickness, have been in part gauged by our greatest modern astronomers. The greatest number of stars visible at any one time to the unassisted human eye above the horizon, is no more than about two thousand, including every star as low as the sixth magnitude, although, and very likely, some of you may have believed you could see many more; but this fallacy is an optical delusion, mainly owing to their scintillations. The minute invisible ones, however, composing the groundwork of the heavens have been counted by tens of thousands, or even by hundreds of thousands. With telescopic aid the observable stars are too numerous for any accurate determination of their number. M. Argelander, a zealous German astronomer, has, however, several years ago, actually published a catalogue of the exact positions of no fewer than a quarter of a million of stars greater than the tenth magnitude.

Here in our southern skies we have several splendid constellations, which many a European astronomer would rejoice, [146] to see, as Argo Navis, Crux Australis, the Milky Way between Scorpio and Centaurus, with the two neighbouring first-class stars in the legs of the Centaur, commonly called the “Pointers.” Moreover, in the same region, and among them, are some curious and peculiarly-attractive objects, very plainly visible on clear nights. I will just refer to some of them:—

- (1.) Those two dark adjacent spaces, called by the old navigators “Coal-sacks,” near Centaurus and the Southern Cross; these black and apparently starless vacancies are, however, occupied by many telescopic stars.
- (2.) Two others, distinct white patches, known by the name of the “Magellanic Clouds,” are not far off from the Coal-sacks, the upper being termed the “Nubecula Major,” and the lower the “Nubecula Minor.”
- (3.) The constellation Crux Australis, or the Southern Cross, always visible, and forming with the two “Pointers” such a glorious sight on a starlight night, has ever been an object of universal attraction. The upper and lower stars, being of similar right ascension, are always on the meridian about the same time, and consequently serve to indicate the approximate position of the South Pole, which is distant about $27^{\circ} 38'$ from the largest and nearest star in the Cross. Here with us this constellation never sets below the horizon. It also presents to our view the daily movements of a south circumpolar star, so beautifully shown by the group of four stars composing

it. In the course of the day the constellation will have made a complete circuit round the South Pole. In this week (of May) those four principal stars are on the upper meridian at 8.45 p.m.; on the next day, at 2.44 a.m., the earth will have turned on its axis through one-quarter of its revolution; the stars will therefore apparently have passed over one quadrant, or the fourth part of the circuit, being at that time due west of the South Pole. At 8.43 a.m. they have performed one-half of their circuit, being now near the horizon on the lower meridian. At 2.42 p.m. they are due east of the South Pole, while the complete revolution is made at 8.41 p.m. At the hour of midnight this constellation is in the four positions—north, west, south, and east of the South Pole—at the end of March, June, September, and December respectively. The two principal stars in Centaurus (already mentioned) are both easily recognised above Crux Australis; Alpha Centauri, the celebrated double star, being that nearer the meridian, while Beta Centauri is between it and Beta Crucis, the most easterly of the four principal stars in the Cross. Alpha Centauri is one of the largest double stars in the heavens, and one of the nearest to our solar system. This double star has been frequently observed for the determination of its parallax. [147]

A few observations from our early scientific and thoughtful voyagers may prove interesting:—

Captain Basil Hall, during a cruise in the southern ocean, refers to the varying position of the stars at the Southern Cross as seen from his ship at sea. "I have observed it," he remarks, "in every stage, from its triumphant erect position, between 60° and 70° above the horizon, to that of complete inversion, with the top beneath, and almost

touching the water. This position, by the way, always reminded me of the death of St. Peter, who is said to have deemed it too great an honour to be crucified with his head upwards. In short, I defy the stupidest mortal that ever lived to watch these changes in the aspect of this splendid constellation and not to be in some degree struck by them."

Again, the remarks recorded by M. M. von Spix and Karl von Martins, in their account of their scientific travels in Brazil in 1817–20, give a very fair specimen of the feelings experienced on these occasions. It is related by them that, "on the 15th June, in lat. 14° south, we beheld for the first time, that glorious constellation of the southern heavens, the Cross, which is to navigators the token of peace, and, according to its position, indicates the hours of the night. We had long wished for this constellation as a guide to the other hemisphere; we therefore felt inexpressible pleasure when we perceived it in the resplendent firmament. We all contemplated it with feelings of profound devotion as a type of our salvation."

The scientific Humboldt has expressed his thoughts in almost similar terms. Referring to his first view of the constellation, he observes that, "We saw distinctly, for the first time, the Cross of the South, on the night of the 4th and 5th of July, in the 16th degree of latitude. The pleasure felt on discovering the Southern Cross was widely shared by such of the crew as had lived in the colonies. In the solitude of the seas we hail a star as a friend from whom we have been long separated. Among the Portuguese and the Spaniards peculiar motives seem to increase this feeling—a religious sentiment attaches them to a constellation the form of which recalls the sign

of the faith planted by their ancestors in the deserts of the new world." And, again, Humboldt remarks, "How often have we heard our guides exclaim, in the savannahs of Venezuela or in the deserts extending from Lima to Truxillo, 'Midnight is past, the Cross begins to bend.'"

I feel the more inclined to give you those items as not infrequently in my own lonely night-watches on the open plains during my long travels in the olden time, fifty to sixty years ago, I have been visited and impressed with similar thoughts and feelings in looking up and contemplating the [148] sky, most especially on some very calm and clear night when, in addition to those constellations and stars already mentioned, I have also had those of Orion, Taurus, Scorpio, Canis Major, and others, and sometimes (as lately here) the brilliant planet Jupiter—together forming a glorious mind-elevating sight. At such seasons, alone beneath the solemn vault of heaven, when the stars were looking down in their silent splendour, an overpowering sense of high feeling steals over one—of time and eternity—of man's littleness and God's greatness. Yet too often, accustomed as we are from our youth upward to see Nature's works outspread before us in eternally renewing riches, we commonly pass them coldly by.

There is also another pleasing natural sight close at hand—the silent, orderly, yet ever-changing march of the regent of the night, the moon, across the vault of heaven: not merely to note its different phases night after night, but also its conjunction with the planets and larger stars, as given in the "Nautical Almanac"; especially to note its passing between the earth and one of the larger really bright stars—to see how instantaneously the star

disappears when hidden by the moon, and how soon and clearly it reappears when the moon has passed by. It is mainly from this well-known appearance that astronomers have fairly and reasonably deduced the fact of there being no inhabitants in the moon, as that single natural phenomenon shows us that the moon has no atmosphere around it, for if it had the star would have been hidden thereby before the moon should pass it.

Yet another curious and little-known item respecting two of our greatest southern stars—Achernar, in Eridanus, and Canopus, in Argo Navis—is this: that these are the only two which never rise above the horizon of Europe whose names have been derived from the ancient astronomers, showing, clearly they were anciently known to them.

To return: the latter of those two great events alluded to by me as taking place this year is the antarctic exploration, which is now sought to be conducted and carried out on a grand and novel scale, even to the wintering there far within the Frozen Zone and not far from the South Pole. And this daring achievement, I have no doubt, will some day be effected; but, for my part, I do not anticipate any great additions to the sciences of zoology, botany, and geology.

The remark has more than once been made to me that so much has been done of late years in the natural sciences, zoology and botany especially, in the discovery of new species in New Zealand, that now little remains to be done. This, however, is not correct; there are hundreds of animals and plants in our colony yet unknown to science waiting to be detected and made known. Take, for

instance, two small yet [149] perfect genera of mosses—*Grimmia* and *Orthotrichum*—hitherto only known, each genus, by four to five indigenous species, but in the last volume (xxvii.) of the “Transactions of the New Zealand Institute” Mr. R. Brown, of Canterbury, has described no less than thirty new species of *Grimmia* and forty new species of *Orthotrichum*. In the same volume also are some scores of new species of the smaller animals described. Plenteous harvests yet await the patient and zealous seeker and observer; but, even if it were not so, the natural delight arising from closely contemplating the wondrous and manifold operations of nature is beyond expression a rich reward. It has been recently observed that “discovery crowds so quickly on discovery that the truth of to-day is often apt to be modified, or amplified, by the truth of to-morrow.” True; yet a single fresh fact may throw a wholly new and unexpected light upon the results already attained, and cause them to assume a somewhat different aspect.

In conclusion, I should like to say a few more words (it may be my *last* words) on the beauties of nature, by which we are surrounded on land and sea, in the hope of inciting some one of my more youthful audience to come out and enlist under Nature’s maternal banner. For while, on the one hand, I know (alas! too well) that there are but a very small number at present inclined that way, yet, on the other hand, this is partly owing to the want of some good, kind, efficient, and loving teacher to strike the dormant chord within the breast that awaits the sympathetic touch, when, like a common match or an electric spark, it immediately responds, and the long

latent but now never-dying flame is enkindled, and a new life begins.

It has long seemed to me that the good time is coming, and ere long, perhaps, will suddenly come, when some loving scientific teacher in a school (it may be in a retired country one) will be led to begin this good and useful work—at first in a humble, unpretentious way, but ere long to be warmly adopted by a whole band of willing, loving, active, eagerly-inquiring young disciples, whose wholesome and pleasing pursuit after the attainment of natural science will be amply rewarded to themselves, and followed after by others; for once begun in reality such is sure to spread, being a matter of truth and life.

I would that I might see this welcome movement begun before that I shall have to say my last farewell to you and to Napier.

Lastly, in closing my long address, I would ask your indulgence for two things apparent in it—the one its being rather irregular (written at intervals, in various moods, between paroxysms of pain); the other its being generally of a [150] homely nature—that is, of things and matters near at hand—lying around us; of things, it may be, that you all knew before; yet, I trust, all done with the very best intention.

I trust you will have perceived that, while throughout my address I have avoided trenching upon theological matters, there is a silver thread of true religion running through it. Further, as pertaining to the great object of the New Zealand Institute, I, as an aged minister of religion and a fervent disciple of Nature, and with increasing convictions of the truth (soon by me to be realised),

would say one word more to my audience, *re* our talents and our time here: that as you sow now you will reap hereafter. Young friends, don't waste time, don't abuse talents; seek to make the best use of both. Our bodies will remain, but our minds will go with us!

And, in a few beautiful and expressive lines of our classical English⁹⁵⁰ poet, Thomson (already quoted from by me), I close:—

And life, thou Good Supreme!
O, teach me what is good; teach me *Thyself!*
Save me from folly, vanity, and vice,
From every low pursuit, and feed my soul
With knowledge, conscious peace, and virtue
pure—
Sacred, substantial, never-fading bliss.
(“Winter”)

950 Thomson was actually Scots, though Dr Johnston included him in his “Lives of the English poets”.

1896 Descriptions of some New Indigenous New Zealand Forest Ferns. *Transactions of the New Zealand Institute* 29: 414-421.

[*Read before the Hawke's Bay Philosophical Institute, 12th October, 1896.*]

Gleichenia, Smith.

1. *G. ciliata*,⁹⁵¹ sp. nov.

Plant erect (rhizome not seen). Stipe 5 in.-7 in. long, slender, $\frac{1}{10}$ in. wide, subterete and obsoletely angled, somewhat concave above, dry, woody, light-brown, smooth. Frond largely flabellate, 8 in.-9 in. broad, 4 in.-6 in. long, forked and dichotomous; main branches spreading, each main branch bearing 2-3 branchlets (in all, 5-7 simple ones in each), sub-coriaceous, dark red-brown above; branchlets linear-acuminate, 5 in. long, 6-8 lines broad, pinnate (or pinnato-pinnatifid cut quite down to rachis), tips very acuminate, narrow, acute. Segments linear, deltoid, 4 lines long; sub 1 line broad at base, opposite and subopposite, acute, margins entire, revolute throughout, glabrous above, glaucous and floccose below; hairs fine, long, entangled, white; veins distinct, pinnate, forked; costa stout, prominent, pale-brown, with large ovate scales on rachis, adpressed, horizontal and lateral, covering segments at base. Scales flat, finely reticulated, red-brown with white margins and much ciliated. Sori biserial, close, on the middle of outer

951 *Stet.*

veinlet, 20–25 on a segment; capsules 2–3 together, yellow, flattened on top.

Hab. On east side of Mount Ruapehu, Taupo district; 1895: *Mr. E.W. Andrews.*

Obs. I. This species differs pretty much from *G. cunninghamii*, Hew., in several characters, as well as in size. A fine and correct drawing of *G. cunninghamii* (made, too, by Fitch), with dissections, is given by Sir W.J. Hooker in his “Sp. Filicum,” vol. i., tab. vi., B, that represents the type species discovered by Cunningham in 1838, in the great interior forest leading from Waimate to Kaitaia, of which, from him at the time, I received a specimen, named by him *G. arachnoidea*. In the accompanying description by Hooker he says, “Stipes clothed with large deciduous scales” (well shown in figure), “fronds of a thick coriaceous texture, the apex of the branches not running out into a tail-like point, but pinnatifid to the extremity, “segments linear,” and (as there shown) “margins not revolute.” Sir W.J. Hooker at that time had only received specimens from the extreme north [415] (from, myself, among others). There is also a much larger and coloured drawing, with dissections, of *G. cunninghamii* (also executed by Fitch) given in the “Flora of New Zealand,” by Sir J.D. Hooker, which differs (in some respects) from the former figure, particularly in the stipe and frond entirely wanting both bullate scales and woolly hairs (which are such an important character in the type); yet in his description these are prominently mentioned; also, “branches pinnatifid, segments decurrent on the branches, falcate, linear, $\frac{1}{3}$ in.– $\frac{2}{3}$ in. long, $\frac{1}{6}$ in.– $\frac{1}{4}$ in. broad, plane, &c.

Capsules 2–6 (in the figure shown in clusters of 4 and 3). Sir J.D. Hooker's work was published ten years later, and then he states, "North Island, as far south as Queen Charlotte Sound."

II. I have given (*supra*) some of those differential characters of *G. cunninghamii* not found in this species; and I do this for two reasons: (1.) I have never found *G. cunninghamii (vera)* in any of my frequent travelling in woods and districts south of the Thames, though I have of species (or vars.) allied to it. Some I sent from time to time (as collected many years ago) to Kew; and I see that Moore, in his "Index Filicum," has noticed them under *G. cunninghamii*, giving my MS. names of *G. intermedia* and *G. venosa*; I had no time then in those days to closely examine them. (2.) I have more lately seen both specimens and drawings (these latter imperfect) of *Gleichenias* collected south of Auckland, and named by the collectors, growers of ferns, and amateurs *G. cunninghamii*, which I believe to be wrongly named, not representing the much larger and peculiarly-marked northern plant.

Davallia, Smith.

1. *D. (Microlepia) pinkneyi*,⁹⁵² sp. nov.

Rhizome densely clothed with spreading hairs (also stipe rachis and subrachises, and veins below), hairs straight, subulate, acute, articulate, whitish, clear, shining at nodes. Stipe erect, 7 in.–11 in. long, slender, dry, deeply channelled, margins pale raised and rounded, pale-brown, dark at base; hairs reddish-brown at base, fugacious and

952 *Microlepia strigosa* (Thbg.) Pr.

then stipe slightly submuricatulate. Frond deltoid-acuminate, 8 in.–9 in. long, 5 in.–8 in. broad at base, glabrous above, pale-yellowish-green, texture membranaceous, bipinnate, main rachis free throughout; pinnae subovate-oblong acuminate, alternate, distant, sub 20-jugate, horizontal, subfalcate, spreading, lowest pair opposite; tips lobed, subacute, crinit. Pinnules rather distant, alternate, subovate-oblong, obtuse, toothed tridentate, petiolate, dimidiate, lateral margins lobed and toothed above, teeth large subacute, lower margin entire, oblique, slightly decurrent; the upper basal pinnule largest, 1 in. [416] long, $\frac{1}{2}$ in. wide, pinnatifid-pinnate at base. Veins numerous, clear, prominent, pinnate, forked, regular not extending to margin. Sori few, 4–8 to a pinnule, distant, intramarginal on tip of veinlet at or near base of serrature, opposite in 4 pairs on the larger pinnules. Involucre very small scale-like, thin, greenish, hairy, margin entire ciliolate. Capsules produced, red.

Hab. In a dry wood near margin of Mangatera Stream, south of Dannevirke; 1895: *Mr. Pinkney*.

Obs. I. A species allied in some respects, though not closely, to *D. (Microlepia) ciliata*, Hook., and to *D. (Microlepia) strigosa*, Sw. (*D. khasiyana*, Hook.).

II. I look upon the finding of this fern as a special acquisition to our known New Zealand ferns, seeing we had only one species⁹⁵³ of this large genus described. It

953 WC: I am aware, from "Appendix Synopsis Filicum," of a second species of *Davallia* (*D. forsteri*, Carruth.) having been discovered in New Zealand by Forster, during Cook's second voyage, at Dusky Bay, in the extreme south, but not detected since.

has also a little history, worth briefly relating, as encouragement towards the detecting of other new forms in our little-known woods. A few years ago Mr. Pinkney (a member of the Hawke's Bay Philosophical Institute) told me, that he had a fern from the bush growing in his private fernery which he did not know, it being barren, yet supposed it might be *Asplenium umbrosum*. At my request he, shortly after, kindly brought me a barren frond, and I found, on close examination, it was not *Asplenium umbrosum*, neither was it known to me; so we waited, in hopes of a fertile frond being produced; there were at that time several barren fronds on the plant. Last year (1895) a fertile frond was developed, which, when full grown, Mr. Pinkney also kindly gave me for examination. He had previously revisited the spot where he had found it (and so did I), but the wood had been lately felled and burnt. Curiously enough, I found in my "Synopsis Filicum," at the place containing the sub-genus *Microlepia*, the terminal portion (one-third or one-fourth) of a fertile frond (or pinna) of, apparently, this same species of fern, which I must have laid there some years ago; but I have no recollection as to where or when I got it. Last month I sent one-half of my fertile frond and two barren ones to Kew.

Aspidium, Swartz.

1. A. (*Polystichum*) *perelegans*,⁹⁵⁴ sp. nov.

Caudex coalescent, stout, 8 in.–12 in. high, 3 in. broad, bearing 10–12 fronds. Stipe 12 in.–13 in. long, very stout, 3–4 lines diameter, dry hard channelled, scales

954 Uncertain, possibly *Polystichum vestitum* (Forst.f.) Presl.

very numerous [417] (also on rachis and subrachises). Frond erect, slightly drooping and spreading, 2 ft. 3 in.–2 ft. 6 in. long, 7 in.–9 in. wide at middle, sublinear-lanceolate, base abruptly truncate, tip narrow, very acuminate; bipinnate, bright-green above, paler below, glabrous, flaccid, fresh, chartaceous when dry; pinnæ horizontal, alternate and subopposite above, very close but not imbricate, sublinear-lanceolate, base truncate, 4 in.–5 in. long, 9–12 lines wide at middle of frond; tips sharply acuminate, subcaudate, finely serrate, 5–6 pairs below opposite and gradually decreasing in size and falcate, the lower 2–4 pairs much deflexed. Pinnules numerous (17–18 jugate), patent very regular, petiolate, alternate, free rather distant, striate when dry, subrhombic-triangular, sometimes sub-trapeziform, and again in other fronds somewhat parallelogrammatic, but always truncate at lower base excised dimidiate, sharply and closely serrate above and below on two principal sides; tips produced sharply acuminate aristate; margins thickened darker green and slightly incurved; the lowest pair of pinnules on pinna much larger, pinnatifid, 6–7-lobed, reclining on rachis and meeting above on upper side concealing it, the lowest pinnule largest, pinnate or trifoliolate; veins pinnate. Sori very small, distant, biserial, usually six on a pinnule, sometimes seven on the larger ones but rarely, situate on middle of inner veinlet nearer costa than margin, on a small dark oval half-punctured tubercle in pinnule; involucre small, bright-brown, orbicular, laciniate, much stipitate and soon possessing an everted obconical shape resembling an umbrella blown inside out. Scales of various shapes and sizes: (1) Large, 1 in.–1¼ in. long, 1 line wide at base,

subulate, tip much acuminate and filiform, glossy, striate, curly, with a rich dark brown-black centre and broad pale margins; margin entire and minutely crisped; (2) smaller, thinner, subulate, $\frac{1}{2}$ in.– $\frac{3}{4}$ in. long, light-brown; (3) filiform, hair-like, reddish, with large branched spreading root-like bases.

Hab. Forests south-west from Dannevirke; 1896: W.C.

Obs. This handsome fern is allied to our well-known New Zealand fern *Aspidium aculeatum*, Sw., var. *vestitum*, Hooker; but I believe (after a prolonged and careful examination) differs from, that fern—and from others also, its near allies, *A. aculeatum*, *A. lobatum*, *A. intermedium*, and *A. angulare*—in several characters. I possess first-class botanical drawings of all of them, with descriptions, in Hooker's "British Ferns." A particularly fine plate of *Aspidium aculeatum*, with dissections, is also given in Beddome's "Ferns of South India," tab. 121. In *Aspidium aculeatum* the pinnæ want the lowest pinnule below on costa (and so in all its allies, *supra*, including var. *vestitum* of Hooker), which [418] in this fern always form a prominent pair with the upper pinnule, and is also the largest, being 6–7-lobed, and overlapping rachis; all its pinnules also are much more stipitate and distant. Beddome says of the pinnules of *A. aculeatum*, "Subpetiolate or decurrent at the very base with the adjacent ones" (*l.c.*, p. 429); moreover, the sori on *A. aculeatum* are usually eight on a pinnule, and their involucres larger; the hairs on upper rachis and subrachises simple, very short, and patent, without scales, and the scales on the stipe are also widely different, broader and shorter and of one form only. Sir W.J.

Hooker says of *A. aculeatum* and its varieties, "Segments superior, base larger and more or less auricled" (*l.c.*, *passim*). Hooker *fil.* also says of *A. (P.) aculeatum*, var. *vestitum*, "Segments lower, outer margin auricled" (Flora N.Z., vol. ii., p. 38), well shown in their respective drawings; and again, "The lower outer margin produced into a short broad blunt auricle" (Flor. Tasm., vol. ii., p. 148)—a family feature common to all varieties *supra*; which character, however, is wholly wanting in this fern.

2. A. (*Polystichum*) *zerophyllum*,⁹⁵⁵ sp. nov.

Plant suberect and drooping; caudex coalescent from old stipites. Stipe 15 in. long, slender, woody, dry, deeply sulcated on upper surface (rachis also to tip), pale-straw-coloured above (with rachis), red-brown at base, paleaceous, roughish with minute brownish tubercles from fallen hairs and scales. Frond oblong-lanceolate, 14 in.—17 in. long, 7 in.—8½ in. wide at middle; tip subacute; base truncate; bipinnate, glabrous, subcoriaceous, harsh; dull light-green above, paler below (when dried); rachis and subrachises paleaceous and hairy. Pinnæ alternate distant petiolate oblong-lanceolate, 3½ in.—4 in. long, 1¼ in.—1½ in. wide at middle, acuminate; tips narrow, very acute, broadest at bases, patent and slightly subfalcate; costa very slender. Pinnules distant alternate petiolate, 10—11-jugate, ovate-acuminate, ¾ in. long, coarsely and sharply serrate above, tip aristate, semi-lobed and produced at base on the upper side rounded, margin entire; the base at lower side excised; the basal pair opposite much larger, 1 in.

955 Possibly *Polystichum vestitum* (Forst.f.) Presl.

long, their sides more regular and subpinnatifid, the upper one overlapping rachis above. Veins few, pinnate in pinnule, simple, distant. Sori rather large, distant on middle veinlet, biserial, usually seven on a pinnule, but on each of the larger basal pair 14–15. Involucre ample 5-angled, light-reddish-brown with a large black centre, reverted in age, subsessile. Scales of two kinds: (1) Long subulate very narrow, dark-brown glossy; tips capillary curved and twisted; (2) smaller light-reddish-brown, thin, weak, crumpled, and hair-like. [419]

Hab. Hilly woods south-west of Dannevirke; 1896: W.C.

Obs. I. A species having affinity with *A. (Polystichum) richardii*, Hook., but differing in several characters, as in larger size and form and different colour, in being bipinnate with pinnae and pinnules distant larger and much more acuminate, in shape and size of pinnules largely and sharply serrated, particularly basal pair on pinnae which are subpinnatifid, in its slender pale stipe and rachis, in it not being mealy or subfurfuraceous below, and also wanting those curious ciliated scales beneath on segments.

II. Sir W.J. Hooker says of *A. (P.) richardii*, “Fronds oblong-ovate, suddenly and finely acuminate, subfurfuraceous beneath with minute subulate scales ciliated at their broad bases; pinnate (scarcely sub-bipinnate), pinnae 2 in.–3 in. long, close and compact, deeply pinnatifid nearly to the costa; segments lanceolate, numerous, close-placed, margin entire or obsoletely crenate rather than serrate” (“Sp. *Filicum*,” vol. iv., p. 23). His figure with dissections of the same fern, pl. 222, *l.c.*, are very good. Baker also, in

subsequently describing it, adds, "Differs from *A. aculeatum* by its more rigid texture, shorter teeth, and lower pinnae not reduced" ("Syn. *Filicum*," p. 253). Sir J.D. Hooker also, in his coloured drawing of *A. richardi* (tab. 78, "Flora of New Zealand")—although the pinnae of his figure are more distant than those of that one in "Sp. *Filicum*" (*supra*), and the drawing in "Sp. *Filicum*" was made *after* that in the "Flora of New Zealand," and more particularly to represent *A. richardi*—nevertheless the pinnules are also sessile, crowded, and scarcely serrate—just as Sir William has them; all which, as we well know, truly represents our New Zealand fern *A. (P.) richardi (vera)*; of which species there are also several sub-varieties, in size all more or less closely resembling the type.

Todea, Willdenow.

1. *T. marginata*,⁹⁵⁶ sp. nov.

Plant suberect, tufted, sometimes with short caudex composed of coalescent stipites. Stipe 5 in.–7 in. long (or more), stout, deeply sulcated above, dull dark-green, thickly covered with red-brown matted floccose hairs (also the same, but more slightly on rachis and subrachises below). Frond oblong-lanceolate, 2 ft. 5 in. long, 9 in.–10 in. broad at middle, tip acute, base truncate (5 in. wide); lower rachis stout but very slender above, bipinnate, glabrous, dark-green, stoutish, membranaceous. Pinnae numerous, sub-30-jugate, oblong (or subdeltoid), acuminate, broadest at base, 4½ in.–5 in. long, 1¼ in. wide, pinnate, subfalcate, subopposite

956 *Leptopteris hymenophylloides* (A.Rich.) C.Presl.

above, opposite below, somewhat distant, 2 in. apart below, decreasing in size from middle downwards.

Pinnules, oblong, 6–7 lines [420] long, 3–4 lines wide, pinnate, free, subfalcate, pinnatifid to costa, deeply forked, lobes long, linear, equal, subacute; tips callous; margins entire, thickened, lighter green; the upper basal pinnule three-lobed. Veins simple, thickish, prominent, extending to margin; white strangulated hairs patent on subrachises among red woolly ones. Sporangia throughout numerous, close, compact, covering pinnule; capsules pitted, red-brown, subsessile.

Hab. Forests near Dannevirke; 1888–96: W.C.

Obs. This fine fern I had often noticed and admired in my annual visits to the woods, but, without closely examining it, had considered it to be a larger plant of the more common species *T. hymenophylloides*, which also grew plentifully there. However, while in those woods in September of this year (having more spare time), I procured a frond for a closer examination, and I find several characters differing from those of *T.*

hymenophylloides. Not only in its much larger size, form, habit, darker colour and texture—all apparent at first sight—does it differ, but in several minute characters given above in its description; as its numerous sporangia thickly covering the pinnules, and their being truly pinnate and free, with thickened and coloured margins and veins; and its pinnæ decreasing in size and very distant on rachis towards base. In the early drawings of the typical specimens of *T. hymenophylloides* these characters do not appear; the forked lobes of the pinnatifid pinnules are shown to be shorter and greatly

unequal, with few and scattered sori confined to their bases, while "sporangia sparsa" is given as a character pertaining to it (Hook, et Grev., "Genera Filicum," tab. xlvi., B.); and in Sir W.J. Hooker's faithful drawing ("Icones Plantarum," vol. i., tab. viii.) a portion of the highly-membranous frond is also separately given to "show the reticulated structure of the frond," which I have failed to detect in this fern. Baker also (in "Syn. Filicum," the latest authority) says, "Tripinnatifid, with pinnules cut down nearly to the rachis," adding (in a note), "There is a form which quite agrees with this in the size and cutting of the pinnæ, but which has the lower ones reduced very gradually, thus receding from the type in the direction of the next species" (*T. superba*, Col., l.c., p. 428), which may possibly be this one here now described, though I doubt it. In a fine specimen of *T. hymenophylloides* (*vera*) I have now before me, I find the pinnules on its middle pinnæ to be largely pinnatifid on their costa, with the lobes on their sides nearer the rachis simple and single instead of forked.

Genus: Unknown.

Plant large, erect, slightly drooping; stipe 10 in.-11 in. long, 2-2½ lines thick, rather slender, dry, sulcate and striate [421] (also rachis to tip), brownish below, pale-straw colour above, hairy; hairs red-brown, shining, copious, short (also on rachis and subrachises, and midrib below), 1 in. long, and straight at base. Frond broadly ovate-lanceolate, 22 in.-23 in. long, 13 in. broad at middle, tip acuminate, bipinnate, subcoriaceous, slightly harsh, glabrous, dull-darkish-green above, paler below. Pinnæ oblong-acuminate, broadest at base, gradually

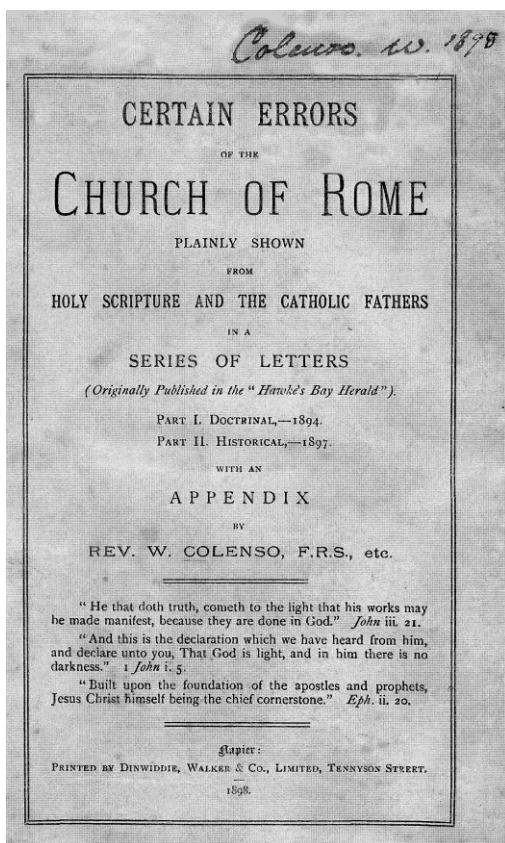
decreasing to tip, 6 in.–6½ in. long, 1 in.–1½ in. broad, alternate, distant, petiolate, horizontal, spreading; tips narrow, much acuminate; the ultimate lobes long, serrate, acute; lowest pinnæ deflexed. Pinnules sublinear-oblong, acute, ¾ in. long, ¼ in. wide, 20–23-jugate, alternate, petiolate, rather distant, falcate, deeply (6–7) lobed or subpinnatifid; lobes nearly as broad as long, somewhat square, each lobe coarsely and sharply serrate, with 4–6 teeth, slightly recurved; midrib stout prominent, whitish above, wavy, free. Veins numerous, pinnate in each lobe, free, reaching to margin.

Hab. Dense forests south-west from Dannevirke; 1896:
W.C.

Obs. It is wholly against my practice and mind to describe a barren and unknown fern; but this is a very striking and peculiar one. Unfortunately I have not yet succeeded in obtaining it in fruit, but hope to do so on my next visit to these woods this summer. In general appearance it resembles no New Zealand fern known to me, therefore I cannot venture to place it under any of our known genera. It may, however, prove to be a species of *Polystichum* (including *Lastrea*), or a *Dicksonia*, though unlike our known species of those genera.

**1898 Certain errors of the Church of Rome
plainly shown from Holy Scripture and the
Catholic Fathers in a series of letters
(originally published in the *Hawke's Bay
Herald*).**

Napier, Dinwiddie, Walker & Co. 85p.



“He that doth truth, cometh to the light that his works may be made manifest, because they are done in God.”

John iii. 21.

“And this is the declaration which we have heard from him, and declare unto you, That God is light, and in him there is no darkness.”

I John i. 5.

“Built upon the foundation of the apostles and prophets, Jesus Christ himself being the chief cornerstone.”

Eph. ii. 20 [4]

PREFACE

This little book will almost tell its own tale very plainly. Why it was written? why at the times it was? and, why by me? Seeing there have been already so many books written on the Errors of the Church of Rome; and, also, by far abler hands and more fully shown.

I may, however, say, I have had much public experience in this warfare, extending over more than 50 years; during which time I have written and published several tracts upon the Errors of Rome; and now, at the end of a long life, am desirous of leaving another witness to the truth behind me.

The more I have read and studied ancient and modern history and the sacred scriptures, the more deeply convinced I am of the soul-destroying errors and doctrines of the Church of Rome, and of their fatal

bewitching tendency, even in these later times when knowledge and science have so largely and generally advanced.

I might have brought forward more from ancient early Christian authorities, but was confined to space in the columns of a newspaper, (during a busy Parliamentary session, too,) and now in republishing I keep to what I then wrote without alteration, save in a few instances the necessary correction of errors in rapid printing. All scripture quotations are taken from *Roman Catholic Latin* and English versions of the Bible. [5]

THE CLAIMS OF THE ROMAN CHURCH.

PART I.—DOCTRINAL.

“No pleasure is comparable to the standing upon the vantage ground of truth.”—BACON, Essay I.
“*Of Truth.*”

(PRELIMINARY.)

SIR,—In town this morning I was asked by several, “If I had read the strange article of praise and glorification of the Romish Church, that appeared in your contemporary (*the News*) last evening?” I replied, “No, as I do not take it in.” I have since seen it, and therefore I now write to you. Not so much, however, on account of that article (no doubt, either written by a *paid* journalist, to order; or by a Romish scribe to please his superiors!)—as on account of

the erroneous unblushing statements, said to have been made by the Roman Catholic Abp. Redwood in his morning's sermon, concerning the Church of Rome; and which I think should not be allowed to go uncontradicted.—

I may briefly refer to some of them:—the preacher, having taken for his text those words of Jesus,— “Going therefore teach ye all nations,” omitted (purposely, I think,) what followed, the important clause, namely,— “Teaching them to observe all things whatsoever I have commanded you;” and then he proceeded to show (in his way), “how the Church of Rome had followed out the injunction—how her doctrine remained unchanged arid infallible, being the doctrine received direct from her Founder. No church which dared not claim to be infallible could be the true church,” &c.— And, possibly all this daring assumption (commonly known in the Colony as *cheekiness*,) might he received as true! by not a few of our easy-going Colonists, who, unfortunately, have neither time nor inclination to trouble themselves about the serious matters of religion—of eternal life; and, therefore, my present object in writing to you, is to ask you to give me permission to write (say) half-a-dozen letters on this subject for the columns of your Paper, to show to my fellow-colonists how very far from the truth are Abp. Redwood's assertions. [6]

I feel, physically, that I am too old now, (in my ninth decade,) to attempt to meet the two R.C. Bishops in public discussion, (as I have on several occasions Priests of their Church some 40-50 years ago,) either in the theatre or on the floor of their own new Church; and therefore I must refrain from challenging them; but I feel,

both mentally and spiritually, that I am, even now, their match—under the banners of Truth and Fair-play—for ecclesiastical history and teaching both ancient and modern. For, believing with my Christian forefathers, “that the blood of the martyrs is the seed of the Church,”—and being an Englishman and having before me the noble and holy examples of our blessed Martyrs—Latimer and Ridley and Cranmer, and a host of others! men, women and children, who died cheerfully for the true faith of Jesus Christ, under the cruel and foul sway and imposture of the Church of Rome,—I consider it my duty to deny and denounce all such Church teaching—as that of Rome being the true church, and of Rome teaching the truth as it is in Jesus,—to both I say, *NAY*. And in the plain and vigorous language of the Church of England (of which I am both a member and a minister,) to again declare, with my forefathers,—“the Church of *Rome* hath erred, not only in their living and manner of Ceremonies, but also in matters of Faith.”—*Art. XIX.*—

Her boasted “Infallibility” I leave to her; her motto—*Semper eadem!* = “Always the same,” let her keep it. That assertion (although false in itself) is good, is useful, is pregnant with meaning,—and should ever be noted, and borne in mind, as the days roll on; for it is the Rock on which she must and will eventually split!—She is “Infallible”! ergo, she cannot alter, and is therefore doomed.

I am, &c,

WILLIAM COLENSO

Napier, November 20th, 1894. [7]

LETTER I.

“Mark now, how plain a tale shall put you down.”—

SHAKESPEARE “*King Henry IV.*” Part I, Act 2.

Postulates of the R.C. Archbishop Redwood, from his sermon preached on Sunday morning, November 18th, on the opening of his new church here in Napier.

- I. That “the foundation of the Catholic Church lay in this exhortation— ‘Going therefore teach ye all nations,’ and in the words addressed to St. Peter, ‘Thou art Peter; and upon this rock I will build my Church.’”
- II. That “the church was originally the depositary of the Divine Commission.”
- III. That “her doctrine remained unchanged and infallible, being the doctrine received from her founder.”
- IV. That “no church which dared not claim to be infallible could be the true Church.”
- V. That “the only infallible church was the Roman Catholic, which comprised within its fold more members than all the other churches put together.”
- VI. That “whilst without, dark and gloomy dissensions prevailed, within the Roman Catholic Church all was peace and unity.”
- VII. That “never before in the history of the world had the light of the Roman Catholic Church shone with greater brilliancy than it did at the present time.”⁹⁵⁷

957 WC: Extracted from *Evening News* and *Daily Telegraph* papers of November 19th.

INTRODUCTORY.

SIR,—I do not desire to waste words and time over this untoward matter; (seeing that so much has been repeatedly and unanswerably written and published during many generations by far abler pens than mine on those very subjects;) for, as far as the hierarchy and the easy-going careless supporters of the Church of [8] Rome are concerned, it would be but lost endeavour,—owing to their (present) blind credulity in the teaching and infallibility of the Church of Rome. Nevertheless, a few plain and, I trust truthful, remarks I would offer on the Archbishop's propositions.

The Church of Rome has ever been noted for being very wary and astute, and the trained and well-schooled higher ranks of her hierarchy most particularly so; but it seems to me, that Archbishop Redwood egregiously failed on this occasion; his assertions being the most inopportune, *mal à propos*, and inauspicious (I mean for his own church and party), and also untruthful, as I intend to show.

The R.C. Archbishop has been here before, indeed I may truly say several times; he knows this place (Hawke's Bay) well, and he knows us, Protestants and Catholics, dwelling here peacefully together; and on his former visits he was fittingly received. Now had he come quietly this time, as a Christian minister should; opened his new church (to which *both* parties had subscribed) and strengthened and cheered his followers, all might have been well—at least in appearance; and he might have returned to Wellington with a feeling of satisfaction, though he would certainly have known of several

important recent particulars concerning the R.C. church, which one would naturally think should have caused (even him) to deeply consider their probable results—along the stream of time; seeing, too, they all tend one way, and that the natural and reasonable one.

I will briefly mention some of them; (for which I am largely indebted to the cablegrams that have appeared in your paper.)

1. The Pope's late and repeated overture to the Great Eastern Church, to come over to him and his church; which invitation has again been repelled with scorn by the Greek Church.
2. The two great church subjects, that have so stirred up the Roman Catholic Kingdom of Austria-Hungary—almost to a revolution: (1) the institution of civil marriages, alike for all; and (2) the recognition and equal protection of all churches and creeds—Roman Catholic, Protestant, Jewish, &c. The Church of Rome, headed by the numerous Bishops of that country and by the Pope himself; stoutly and for a long time opposed these necessary alterations; but finding opposition useless, (the Emperor himself, though a devoted Roman Catholic, supporting the changes,) they gave way; the Pope setting the example to the [9] many recalcitrant Bishops of that eminently Roman Catholic country. It is highly interesting to read, in the first class daily London papers, the whole of this important struggle between the Roman Catholic Church and the State—between mere authority and reason! and to note, that the Roman Catholic Church—once so powerful, so dominant, in the kingdom, was foiled and beaten on every movement.

3. The ends of those misguided men—Anarchists—Cesario and others, who have recently been condemned and executed in France, Italy, and Spain, should also have been pondered over by Abp. Redwood; for those men were educated Roman Catholics, and trained and brought up in their schools and church; and yet, with a fearful death before them, and that too the just reward for their high crimes, they persistently refused all offers of Roman Catholic religious services to the last!
4. The lamentable state of things, amounting to almost perennial revolt and much bloodshed, in those South American States where formerly the Roman Catholic Church held undisputed sway, should also have taught the Archbishop a useful lesson; for the R.C. Church now among them is at a discount—nil—nowhere!—
5. The Pope's present position (from his own view of it); his childish wailings as a prisoner in the Vatican! I would not allude to this, only the poor old man makes so much of it, in the vain hope of R.C. nations coming to the rescue! and the Archbishop saying—“the Church of Rome never before stood so high, so well as she does now”! (“None so blind as those who won't see.”)
6. Then as to her great overwhelming “numbers.” This is scarcely worthy of even a passing notice, as the contrary is too well known; witness the census returns of our old Home—the United Kingdom and Ireland, and also of our own Colony. But I can understand how the Archbishop made this mistake, through his taking the gross census of any R.C. nation (as France, for instance), and merely deducting therefrom the numbers of those who were returned as members of the Reformed Churches, and then

claiming the gross number left. But all the world knows, that a very large proportion of the people of those nations, of all classes from the highest to the lowest, will have nothing whatever to do with the Romish Church, nor with her teachers, being professed sceptics. [10]

7. And lastly, (for I must shorten citing my many items,) the most wonderful church transaction of the age—the consecration of a Bishop of the Reformed Church of Spain, Señor J. B. Crobera, at Madrid on the 23rd day of September last, in the “Church of the Redeemer” (*Calle Benefecencia*); the Archbishop of Dublin Lord Plunket, and the two Bishops of Clogher and of Down, going thither purposely to perform that holy rite, as had been previously decided by the General Synod of the Irish Bishops in April last. I have, in a letter from one who was present at Madrid on that occasion, a full account of the whole transaction. “A number of priests of the Spanish Reformed Church from many towns in Spain had assembled in Synod at Madrid during the preceding week; the church was filled, more than 400 being present, of whom 134 remained to the Holy Communion; the new Bishop consecrating the bread and wine which was done after the ancient custom in the Mozarabic ritual—the Bishop facing the congregation.” The writer also goes on to say,— “As the fixed day for consecration drew near much anxiety was felt, as to whether the Roman Catholic Government would interfere or not. The communication made (on the Saturday preceding) to the Bishop-elect, was to the effect, that if no public demonstrations were made, and no notice appeared in the papers, protection would be granted. Too much can hardly be said of the action of the Government in thus preserving to the

Reformers their hardly-earned liberties.” And to this I would merely add, as being almost equally wonderful and agreeing with the foregoing relation, the pleasing Church news, of the recent opening of several Protestant churches in Italy, and also in Rome itself!— Here I close my first letter; hoping my R.C. fellow-colonists, who may read what I have written, may duly consider the same in a similar spirit to mine. While to Archbishop Redwood I would more particularly say, (as the archer of old wrote on his arrow which did its work.)— “This to thy right eye, Philip”; and conclude with a quotation from his own Holy Book, a warning reproof from our Lord,— “You know how to discern the face of the sky, and *can you not know the signs of the times?*” (*Matt. xvi, 3.*)

I am, &c.,

WILLIAM COLENSO.

Napier, November 23rd, 1894. [11]



LETTER II.

“Retire! the world shut out, thy thoughts call home; Imagination’s airy wing repress; Lock up thy senses, let no passions stir, Wake all thy soul to Reason.” —YOUNG.

SIR,—In my last letter I took up briefly Abp. Redwood's VII. and last postulate, about the exceeding and extra great brilliancy of the Romish Church at the present time:—so as to follow him closely, that, too, being his most modern matter. I now take up his first postulate:—“That the foundation of the Catbolic Church lay in this exhortation—‘Going therefore teach ye all nations;’ and in the words addressed to St. Peter, ‘Thou art Peter; and upon this rock I will build my church.’” This I both admit and uphold, but not in Abp. Redwood's meaning. My contention is:—

1. The term “Catholic Church” does not belong exclusively to Rome.
2. The rock spoken of was not Peter, but Christ.

—Both statements easily proved to the honest man, from Scripture, and further supported by ancient Church History.

1. The term “church” (a Scriptural word) means *congregation*. Just as it was in the Jewish Church (O.T.), the whole body of worshippers, the whole people of Israel, as well as a special assembly of them gathered together for worship in a particular place. Thus we read:—“Be without offence to the Jews and to the Gentiles, and to the Church of God.” “Saul made havoc of the Church;” “I persecuted the Church of God.”⁹⁵⁸ It also signifies the church or body of Christians in a particular town or city. Thus we read of “the church which was at Jerusalem,”—“the church which was at Antioch”: “the church at Ephesus”: “the church of God

958 WC: 1 Cor. x, 32: Acts viii., 3: 1 Cor. xv, 9.

that is at Corinth.”⁹⁵⁹ The term is also used for a single family of Christians,—or a single congregation meeting for worship in a private house, as the first Christians did “Prisca and Aquila my helpers in Christ Jesus, and the church [12] which is in their house”: “Salute Nymphas and the church which is in his house”: “Paul to Philemon,—and to the church which is in thy house.”⁹⁶⁰ And so, just as it was formerly in the Jewish Church, the term *Church* among Christians in the New Testament means,—a single congregation, or the whole body of Christians in a particular place, or the whole body of Christians dispersed throughout the whole world.

Ignatius calls the Church—“the multitude or congregation that is in God.” (*Trail.* 8.)

Justin Martyr identifies the Church with those called Christians, partakers of the name of Christ; speaks of it as one synagogue and one assembly; and says it is the daughter of God. (*Dial.* p.287.)

Cyril of Jerusalem says,—“The Church is called *Ecclesia* (assembly) because it calls out and assembles together all; just as the Lord says, ‘Assemble all the congregation to the door of the tabernacle of witness.’” (*Lev.* viii. 3.)

Jerome says, “the meaning of *Church* (*Ecclesia*) is *congregation*. It is not held together by walls, but by the truth of its doctrines, and where the true faith is there is

959 WC: *Acts* viii, 1: xiii, 1: xx, 17: *1 Cor.* i, 2.

960 WC: *Rom.* xvi. 5: *Cor.* iv. 15: *Philemon* 2.

the church. The Head is in Heaven, but its members upon earth. It is built on prophets and apostles,” &c., &c.⁹⁶¹

The term “Catholic” means (as is well known) *universal*. This designation is used in all the early creeds, and in the writings of the Fathers, and very likely originated in the quick spread and universality of the Christian Church among all nations, as distinguished from the local nationality of the Jewish Church. The same Christian Church, being one in its foundation, in its faith, and in its sacraments, was spread universally among all nations

2. The rock spoken of was not Peter but Christ.

Jesus early, on seeing Simon Peter, surnames him *Cephas*, saying, “Thou art Simon the son of Jona, thou shalt be called Cephas”⁹⁶²—a word in the Jewish language of same meaning as Peter; and afterwards on that memorable occasion, (noted, *Matt.* xvi. 16–18,) used the translation of it into Greek—*Peter*. [13]

Though here, it may be observed, there are niceties used by Jesus in speaking in that wonderfully expressive Greek tongue, which at least are not plain to the English reader: and in this sentence are partly also dependent on gender. Two distinct words are here used, *petros*, and *petra*. Diodati, in his Italian translation of the New Testament, preserves the same distinction of gender, as in

961 WC: “Ecclesia enim congregatio vocatur. Ecclesia non parietibus consistit sed in dogmatum veritate; Ecclesia ibi est, ubi fides vera est, caput in cœlo, membra in terras.”

962 WC: *John* i. 42: *Mat.* iv. 18.

the Greek; rendering *Petros* by *Pietro*, and *petran* by *Pietra*.

Now observe, our Lord had early—in his Sermon on the Mount—spoken clearly and impressively of “*the Rock*” (*teen petran*);⁹⁶³ meaning thereby himself and his Father; Rock being a well-known ancient and prized Jewish name for God.⁹⁶⁴ And in the New Testament this latter term (*petra*) is used for a bigger object (rock) than the other term (*petros*).⁹⁶⁵ So that, while *petra* is used for a large rock and rocks = crag, cliff, hill, mount, tor, &c., the other term, *petros*, is more commonly used for a smaller rock or big stone. Homer so uses it for a piece or fragment of a rock, such as a strong man might throw,⁹⁶⁶ and it is well worthy of notice. (1) That this smaller term (*petros*) is commonly used as Simon’s name, together with that of Cephas, and never the larger one. (2) That Cephas, the old Jewish name, is also used by the Apostles themselves when speaking prominently of Peter, as if to show, they knew nothing of any especial distinction contained in the newer rendering of it.⁹⁶⁷ (3) And that the distinction between the two terms (*petra* and *petros*), is apparently carefully maintained by Peter

963 *Matt.* vii. 24, 25: *Luke* vi. 48.

964 WC: “And David said, ‘The Lord is my *rock*, and my strength, and my Saviour.’”—*2 Kings* xxii. 2: and in the Authorized English version, frequently, as, *Deut.* xxxii. 18: *1 Sam.* ii. 2 : xxiii. 3 : *Ps.* xviii. 2 : xiii. 9: *Ixii.* 2, &c.

965 WC: See (besides the texts quoted) *Matt.* xxvii. 51, 60: *Luke* viii. 6, 13: *Rom.* ix. 33: *I Cor.* x. 4; *1 Pet.* ii. 8: *Rev.* vi. 15, 16.

966 WC: *Iliad* viii. l. 270 : xvi. l. 411, 734: xx. l. 288.

967 WC: *1 Cor.* i. 12: iii. 22: ix. 5: *xv* 5: *Gal.* ii. 9.

himself in his Epistle, where he frequently mentions stones as believers in Christ, but applies this term (*petra*) only to the Lord. (1 Pet. ii. 8, &c.)

And now let me also briefly notice how the ancient Great Fathers of the Catholic Church considered this charge of Christ to Peter; their testimony is alive and to the point.

1.—POSITIVELY.

Athanasius we find speaking of Christ as the foundation of the Church. [14]

St. Ambrose says, “The faith is the foundation of the Church; not St. Peter, but St. Peter’s faith; for the true Church is like a good ship beat against by many waves, but the true faith on which the Church is founded, should prevail against all heresies.”⁹⁶⁸

II.—NEGATIVELY.

One of the best and clearest instances under this head, that I remember in my reading, is from a celebrated writing by one of the earliest Bishops, or Popes of Rome himself, by Clement, in his Epistle to the Corinthians; a work of so great repute in the early infant church that it was bound up with the New Testament, and like it read publicly in the churches. Now in that long and diffuse letter of 60 chapters, St. Clement only mentions Peter

968 WC: “Fides ergo est Ecclesiæ fundamentum. Non enim de carne Petri, sed de fide dictum est, quia portæ mortis ei non prævalebunt, sed confessio vincit infernum. Nam cum Ecclesia multis tanquam bona navis fluctibus sæpe fundatur, adversus omnes hæreses debet valere Ecclesiæ fundamentum. — (*De Incarnationis Sacramento*, cap. v.) [St. Ambrose said that not Peter, but the faith of Peter, was the foundation of the Church].

once, and then in very few words, thus:—“ Let us set before our eyes the holy Apostles: Peter by unjust envy underwent not one or two but many sufferings, at last being martyr'd, he went to the place of glory that was due unto him.” (*cap. v.*) This, considering the whole tenour of his long letter, could not have sufficed had Peter been Pope so recently before him, as the Romanists say; Clement himself being the fourth Bishop, or Pope of Rome, and all within a few years; while of Paul, Clement says a great deal more. Moreover, I may also adduce Paul himself: for (1) he could never have written his Epistle to the Romans (A.D. 60), as he did, if Peter was then there as the first Pope, as the Romanists say, or if he had ever been there. (2) Paul in his *last* letters, written from Rome (A.D. 66), mournfully tells Timothy,— “at my first answer no man stood with me, but all men forsook me; may it not be laid to their charge. But the Lord stood by me and strengthened me” (*2 Tim. iv. 16, 17*). Where then, again was Peter? And mark, this same year, according to the Romanists, was the year of Peter's death at Rome, after being Pope there for some years. Further still, of Peter it is especially said,— “The Gospel of *the circumcision* was committed to him,” and the arrangement come to by the Apostles, on that great meeting of the Church at Jerusalem, was, that “Paul and Barnabas should go unto the Gentiles, and they (James, Cephas, and John) unto *the circumcision*—or the Jews” (*Gal. ii. 8, 9*) And just so Peter addresses his Epistle. [15]

All these circumstances tend one way, namely to show that Peter was never a Pope of Rome at all and probably never at Rome.

CONCLUSION.

1. It sounds strange, harsh, unscriptural, to translate “*upon* this rock,” “*by*, or *through* this rock.” 2. Note well, Christ’s own words, “*upon* this rock *I will build my Church.*” Christ calls it *his Church*, not Peter’s; and says, “*I will build,*” not thou shalt build. It is certain, that Christ is the foundation of the Church, from Peter’s own words, and Paul’s, and Isaiah’s, &c.,⁹⁶⁹ —and the Scriptures generally: and on Him as foundations the apostles and prophets; and on them (still continuing the metaphor) all true believers.⁹⁷⁰

To sum up: our Lord’s meaning therefore is: Upon this solid and immovable foundation of truth thou, Peter, has just publicly made, revealed to thee by my Father in Heaven, (of “My being the Christ the Son of God,”) “*upon this Rock I will build my Church*, and the gates of hell shall not prevail against it.” This is the sure and certain stand took by our British martyrs before Rome, scouting the notion of “the brickle Peter” (as they termed him) being the true Rock! The working of the foundation of faith in souls is God’s work. Men at best are but ministers (servants) by whom others believe. They have but service in, not lordship over, the Church of God: and Peter himself, in his acts and teaching is most strong and exemplary on this point.⁹⁷¹

I am, &c.,

WILLIAM COLENSO.

Napier, November 26th, 1894. [16]

969 WC: 1 Pet. ii. 6-8 ; 1 Cor. iii. 11; Isaiah xxviii. 16.

970 WC: 1 Pet. iii. 4, 5 &c.; Eph. ii. 20; Rev. xxi. 14.

971 WC: Acts x. 25, 26; 1 Pet. v. 1-3.

LETTER III

“Ah, Constantine! of how much ill was mother,
Not thy conversion, but that marriage dower
Which the first wealthy Father took from thee!”

DANTE, *Inferno*,

Canto xix.

SIR,—I now proceed with my dissection of Abp. Redwood's postulates

II. That “the Church was originally the depositary of Divine Commission.”

III. That “her doctrine remained unchanged and infallible, being the doctrine received from her Founder.”

To the former of these two I say, Granted; provided by “Divine Commission” is understood the sacred Scriptures:— To the latter I say Denied; if by the Church the preacher means the Church of Rome.

II. That “the Church was originally the depositary of the Divine Commission.”

The Christian Church was originally the depositary—keeper and witness—of Holy Scripture; for unto it, as unto the Jewish Church of old, “the words of God were committed,” (*Rom. iii. 2,*) and as the Jews had the Old Testament Scriptures “read in the Synagogues every Sabbath-day,” (*Acts xv. 21,*) so the Christian Church has the Scriptures of both Old and New Testaments read constantly in her congregations. The Scriptures are a sacred deposit left to the Church to guard and to teach. In no way can she more truly fulfil her office of “pillar and

ground of the truth," (*1 Tim.* iii. 15) than by preserving and maintaining those Scriptures in which the truth is to be found. And this is abundantly shown by the manner in which the ancient Churches collected and preserved the sacred writings, and handed them down to us. In the early ages, when printing was unknown, and when neither books nor paper nor materials for writing were as we have them now, it must have been a very laborious and constant and truly wonderful [17] work to make correct copies of large and valued writings. Yet the Christian Church undertook the task, and when we consider the fierce and frequent persecutions of the Christians by Imperial Rome—in which all such books and writings were demanded to be yielded up and burnt—it seems surprising that any of them should have escaped.

To the care of the Church her Lord has entrusted the Bible. She keeps it and testifies to us that in it is the word of God, and teaches us the truths contained in it; ever bearing in mind the solemn statement, often repeated,—“You shall not add unto the word I speak to you, neither shall you take from it: keep the commandments of the Lord your God which I command you.” (*Deut.* iv. 2.) “Every word of God is fire-tried: add not any thing to His word lest thou be reproved and found a liar.” (*Prov.* xxx. 5, 6.) Her ministers are enjoined “to hold the form of sound words which thou hast heard of me in faith and in love,” (*2 Tim.* i. 1, 3,) “to preach the word, instant in season and out of season,” (*2 Tim.* iv. 2,)—to teach and preach the truth of the gospel. Their commission is, “Going *teach* ye all nations—*teaching them to observe all things whatsoever I have commanded you.* (*Matt.* xxviii. 19, 20) [This latter and most important half of the

commission Abp. Redwood *omitted!* as I had observed in my “Introductory” letter.] And “by that faithful word which is according to sound doctrine,” the ministers of the church are “to convince the gainsayers.” (*Tit. i. 9.*) And so the Christian Church leads us on by preaching and teaching and other modes of instruction to take the Bible in our own hands and read for ourselves. In these and many similar modes, the Church is a witness and Mother and Teacher as well as the depositary or keeper of Holy Writ. Indeed we can hardly conceive a state of things in which it could be otherwise, especially in these modern times when almost every one can read, and the Bible, now translated into so very many languages, so easily obtained. Therefore it is the duty of every Christian, who has it in his power, to search the Scriptures, in order to learn God’s will from them; just as it is the right and the wisdom of every citizen to acquaint himself with the laws of his country, and to endeavour to render them an intelligent obedience. And so my Church of England teaches;—“Holy Scripture obtaineth all things necessary to salvation so that whatsoever is not read therein, nor may be proved thereby, is not to be required of any man, that it should be believed [18] as an Article of Faith, or be thought requisite or necessary to salvation.” (Art. VI.) To Scripture we look, as the only written source of all Divine knowledge. But when we have fully established this principle, we need not fear to make use of every light with which God has furnished us, for the right understanding of Scripture; whether it be a critical knowledge of ancient languages, or history, or antiquities, or the belief of the primitive Christians and the doctrines which holy men of old deduced from those

sacred writings, which were to them, as to us, the only fountain of light and truth.

Now for a few plain extracts from the early Christian Fathers:—

Ireneus (A.D. 180,) says, “We know that the Scriptures are perfect as being spoken by the Word of God and his Spirit.” Again, “We have received the disposition of our salvation by no others—the Scriptures, the pillar and ground of our faith.”

Athanasius (A.D. 350): “The holy and divinely-inspired Scriptures are of themselves sufficient to the enunciation of truth.” Again, “These are the fountains of salvation, that he who thirsts may be satisfied with the oracles contained in them. In these alone the doctrine of salvation is contained. Let no man add to, or take from them.”

Basil (A.D. 370): “Believe those things which are written; the things which are not written seek not. It is a manifest defection from the faith, and a proof of arrogance, either to reject anything of what is written, or to introduce anything that is not.”

Ambrose (A.D. 374): “How can we use those things which we find not in the Scriptures?”

Chrysostom (A.D. 398) : “Look for no other teacher; thou hast the oracles of God; none teaches thee like these.”

Vincentius Lirinensis (A.D. 434,) begins with the admission, that, “The Canon of Scripture is perfect, and most abundantly sufficient for all things.”

John Damascene (A.D. 736): “All things that are delivered to us by the Law, the Prophets, the Apostles and the Evangelists, we receive, acknowledge, and reverence, seeking for nothing beyond these.”

It can scarcely be necessary to adduce more or stronger proofs, that the Fathers with one voice affirm the perfection and sufficiency of the written word for the end for which it was written, namely, *for a rule of faith, and far a rule of life.* And these prove [19] that the testimony of the primitive Fathers is in favour of the Protestant rule, and not of the Roman.

III. That “her doctrine remained unchanged and infallible, being the Doctrine received from her Founder.”

This I *deny*: for (1) It is *not* unchanged and consequently not infallible: and (2.) It is *not* the doctrine received from the Founder of the Church.

Volumes have been written here, showing the many and ever-increasing errors and heresies of the Church of Rome; some of them are pretty well known; I must, however be brief:—

Antiquity is a mark of truth, and novelty a mark of error, in religion. So that I may say with Tertullian, “That is truth which is first: that is false which is after. That is truly first which is from the Apostles.” (Tert., *Cont. Prax. Cont. Marc.*)

Rome at first and for many years faithfully held the same deposit, although even then many strange sects and teachings from time to time arose, which had commenced in the days of the Apostles themselves. To put down

heresy and schism and fix a true Church teaching on a firm and uniform basis, the first General Council was called by the Emperor Constantine; this composed of 318 Bishops, besides priests and deacons, from the whole Christian world, assembled at Nice in the year 325, and there the celebrated creed called *Nicene*, still in use, was formulated—though the latter portion of it was added 6 years after, at the second General Council, summoned by the Emperor Theodosius, and held at Constantinople in the year 381. This creed, the Church of Rome, in common with other churches, accepted and signed the decrees. Two other great councils were subsequently held, during the first half of the next century; one at Ephesus, and one at Chalcedon. These 4 were General or Ecumenical Councils; of them Pope Gregory the Great said,— “he reverenced the first 4 Synods as he did the Evangelists.” The Council held at Ephesus, (A.D. 431,) had decreed, that no addition should be made thenceforth to the (Constantinopolitan) Creed which all had subscribed. Afterwards, the churches of France and Spain added to the creed the words *Filioque* = “and the Son,” and so chanted the Creed in their Liturgies. In the early part of the 9th Century, Pope Leo III was appealed to about this innovation, and the Pope decreed in a Synod held at Aquisgranum, that no such addition ought to be made to the Creeds of the Church. Nay, so important did he deem a strict adherence to the Creeds in their original form that he [20] caused the Constantinopolitan Creed, in the very words in which it had been penned at the Council, to be graven on silver plates both in Latin and Greek, and so to be publicly set forth in the Church. Afterwards, however, Pope Nicolas the First

excommunicated Photius the Patriarch of Constantinople; who, in his turn, assembled a Council at Constantinople in 864, and excommunicated Pope Nicolas. In 879 a Council was again held at Constantinople, and it was declared that the addition of *Filioque* made by Rome should be taken away. This unhappy state of disunion between the two Churches continued for a long time, until 1053, when the contest was again revived, and Leo IX., Pope of Rome, summoned a Council at Rome, and excommunicated the Greek Church! on which, Cerularius the Patriarch of Constantinople in a public council excommunicated Pope Leo and his Roman Church. Thus arose the sad schism between the Eastern and the Western Churches which has never since been healed. [I have been the more diffuse on this great and early blot in the Church of Rome, because of the present Pope having lately and again moved towards the Greek church, (as mentioned by me in my Introductory letter,) but not, I fear, in a repentant spirit.]

At a much earlier date, however, than that of this great schism, many errors—crude novelties—arose and abounded, and were held in esteem and practised in several churches; such as, the worship and invocation of Saints and Angels, the adoration of Images and relics, &c, &c, but all were opposed by the early great Christian Fathers. Thus, Justin Martyr, “It becomes Christians to worship God only.” (*Apol.* 1. p.63.) Tertullian, “For the safety of the emperor we invoke God, eternal, true and living God.... Nor can I pray to any other than Him, from whom I am sure that I may obtain, because He alone can give it.” (*Apol.* c. 30.)

Origen: “To worship anyone besides the Father the Son and the Holy Spirit is the sin of impiety.”⁹⁷² Athanasius observes, that St. Peter forbade Cornelius to worship him. “It came to pass, that when Peter was come in, Cornelius came to

falling at his feet adored. But Peter lifted him up, saying, ‘Arise, I myself also am a man!’” (*Acts* x. 26): and the angel [21] forbade St. John, when he would have worshipped him—“I John, after I had heard and seen, I fell down to adore before the feet of the Angel, who shewed me these things. And he said to me, see thou do it not; for I am thy fellow-servant—Adore God.” (*Rev.* xxii. 9.) “Wherefore,” he adds, “it belongs to God only to be worshipped, and of this the angels are not ignorant, who, though they excel in glory, are yet all of them creatures, and are not in the number of those to be adored, but of those who adore the Lord.”⁹⁷³ Epiphanius tells us that, whereas some had treated the Virgin Mary with contempt, others were led to the other extreme of error, so that women offered cakes before her, and exalted her to the dignity of one to be worshipped. This he says, was a doctrine invented by demons. “No doubt the body of Mary was holy but she was not a God.” Again, “The Virgin was to be honoured; yet not given us to be worshipped, but herself worshipper of Him who was born of her after the flesh.” He then continues, that “the words, ‘Woman, what is to me and to thee?’ were spoken on

972 WC: “Adorare quempiam præter Patrem et Filium et Spiritum Sanctum impietatis est crimen.” *Comment in Epist. ad Roman.*, lib. 1. n. 16. Cornp. *In Jesum Nave*, Hom. vi. 3. “Non enim adorasset, nisi agnovisset Deum.”

973 WC: Athanas. *Cont. Arian.* ovat. iii., tom. 1, p.394.

purpose that we might know her to be a woman, and not esteem her as something of a more excellent nature, and because our Lord foresaw the heresies likely to arise."

Again, he says, "Neither Elias, though he never died, nor Thecla, nor any of the saints, is to be worshipped. If the Apostles will not allow the Angels to be worshipped, how much less the daughter of Anna" (that is, the Blessed Virgin). "Let Mary be honoured, but let the Father the Son and the Holy Spirit be worshipped. Let no man worship Mary. Therefore though Mary be most excellent, holy and honoured, yet is it not that she should be adored." (*Hæres.* 79.) Thus early did the erroneous worship of the Virgin show itself, and thus earnestly did the Christian Fathers protest against it; and so, by degrees that false worship led to the Mariolatry and Saint worship of the Church of Rome. We have the clearest proofs that nothing of the sort was permitted or endured in the first four centuries. Later than that we have distinct evidence in the same direction from those great lights of the Church, St. Chrysostom and St. Augustine. The former protests against angel worship as the most fearful abomination, and attributes its origin to the invention of the devil (*Homil. IX. in Coloss.*) Notwithstanding, as the ages rolled on, (truly enough styled "the dark ages," there being then no Printing Press!) more and more of religious errors arose, and all such [22] being matters of great gain (*money*) to the Church of Rome she encouraged them: until this, at last, brought about the glorious Reformation in the early part of the 16th century, when the Church of Rome held her notorious Council at Trent (A.D. 1545-5563), ard to do the thing boldly, unblushingly added to

the ancient universal Catholic Creeds no less than 12 new articles, viz.—

1. Seven Sacraments.
2. Trent doctrine of Justification and Original Sin.
3. Propitiatory sacrifice of the Mass.
4. Transubstantiation.
5. Communicating under one kind.
6. Purgatory.
7. Invocation of Saints.
8. Veneration of Relics.
9. Worship of Images.
10. The Roman Church to be the Mother and Mistress of all churches.
11. Swearing obedience to the Pope.
12. Receiving the decrees of all her Synods and of Trent.

This is styled “the Creed of Pope Pius IV.;” it begins with a declaration of firm faith in the Constantinopolitan Creed, and then continues with a like declaration of firm faith in the twelve novelties enumerated; and concludes with a solemn vow and profession of all this as “the true Catholic Faith, out of which no one can be saved.”⁹⁷⁴

And still, not content, (errors and heresies like mushrooms and toadstools ever springing,) in my own time, and since I came to New Zealand, has the Church of Rome added yet more to her ever growing creed,— viz., “the Immaculate Conception of the Virgin Mary,”

974 WC: “Hanc veram Catholicam fidem extra quam nemo salvus esse potest.... sponte profiteor ac veraciter teneo, spondeo, voveo et juro. Sic me Deus adjuvet et hœc sancta Dei evangelia.” *Concil. Trident. Canones et Decreta*, pp. 370-373.

and “the Infallibility of the Pope,”—both alike glaring errors! And yet, forsooth! Abp. Redwood dares to preach—“the doctrine of the Church of Rome remained unchanged, being the doctrine received from her Founder.”

And here, I think, I cannot do better than to bring forward another Article of my Church bearing on the novelties of Rome in a few plain words :—“The Romish doctrine concerning Purgatory, [23] Pardons, Worshipping and Adoration, as well of Images, as of Reliques, and also Invocation of Saints, is a fond thing, vainly invented, and grounded upon no warranty of Scripture, but rather repugnant to the Word of God.” (*Art. XXII.*)

As I headed this letter with a quotation from a great and good Roman Catholic author and poet, an Italian too, (the same being the conclusion of his address to the soul of one of the wretched Popes of Rome whom he saw suffering torment in hell Inferno,) I will conclude with another stanza by the same Poet, but taken from his *Paradiso*, concerning Pope Boniface VIII. These words, Dante puts into the mouth of St. Peter speaking in heaven; a terrible invective against that miserable Pope, that makes the whole heavens red with anger:—

“He who usurps upon the earth my place,
My place, my place, which vacant has become
Now in the presence of the Son of God,
Has of my cemetery made a sewer
Of blood and fetor, whereat the Perverse
Who fell from here, below there is appeased.’

Par. xxvii. 22.

I am, &c., WILLIAM COLENSO.

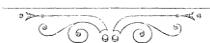
Napier, November 29th, 1894.

P.S.—In your Paper of the 27th you have a letter concerning me, and my promised letters to you on the Claims of the Roman Church, signed “Mickey O’Rafferty” (*alias* Father ——), in which there is a rather large quantity of piquant seasoning. “Mickey,” poor fellow! is not a good cook; and as he is fond of quoting from “pagan” authors (as he calls them), Horace and Homer, (“Mickey” probably knowing them better than the Scriptures,) comparing me with Thersites; I may be permitted to quietly remind “Mickey” of the suitable advice given by another of Homer’s worthies Æneas, to Achilles, on a similar occasion

“To whom Æneas answer thus returned:
 Pelides! hope not, as I were a boy,
 With words to scare me. I have also taunts
 At my command, and could be sharp as thou.
 By such reports as from the lips of men
 We oft have heard....
 Reproach is cheap. Easily might we cast
 Gibes at each other, till a ship that asks
 A hundred oars should sink beneath the load!”

Iliad xx. l. 199 et al: l. 246 et al.

[24]



LETTER IV.

And why even of yourselves do you not judge that which is just?" — JESUS (to the multitude), *Luke. iii. 57.*

"Prove all things: hold fast that which is good." —PAUL (to the Church), *1 Thess. v. 21.*

SIR,—I now continue my brief observations on Abp. Redwood's weak and sophistical postulates.

IV. That "no church which dared not claim to be infallible could be the true church."

V. That "the only infallible church was the Roman Catholic."

I take these two theses together, as to what is alike predicated of them—"Infallibility"; Only separately considering them as (1) general, and (2) special.

I. OF THE GENERAL AFFIRMATION.

I have already, in a preceding letter, shown the true ancient meaning of the term *church*. And, first, of this word—"Infallibility"; its meaning:—Exemption from error; privileged from error; incapable of mistake.

Infallibility is the highest possible perfection of the known faculty. A man cannot be as God infallibly knowing good and evil. Infallibility never was, never could be, the sign, or privilege, or prerogative of any church; whether with the patriarchs, Noah, Abraham, &c.;—with the Jews, on their escape from Egypt,—witness "the church in the wilderness,"—(*Acts vii. 38,*) Aaron the high priest and their worship of the golden

calf, (*Ex. xxxii.*)—Moses the Lawgiver—“What shall I do to this people?” (the church) “yet a little more and they will stone me!” (*Ex. xvii. 4*)—the Jewish Church, in the times of their Kings, declaimed against by the prophets; and, subsequently, by Jesus himself, “Wo to you, scribes and Pharisees, hypocrites; because you are like to whitened sepulchres, which beautiful outwardly appear to men, but within are full of dead men’s bones and [25] of all filthiness. So you also outwardly indeed appear to men just, but inwardly you are full of hypocrisy and iniquity.... Behold, your house shall he left to you desolate.” (*Matt. xxiii. 27, 28.*) And note well how that Church dealt with Jesus, the Apostles Peter and John and Paul, and also Stephen. And if it be retorted,—“Oh those were not the Christian Church.” Very well: then, let us briefly consider the Christian Church; “the kingdom of heaven” on earth; note, the plain and striking parables of Jesus:—the wheat and the tares; the net with fishes; the barren fig tree; the vine with its barren branches;—“If anyone abide not in me: he shall be cast forth as a branch, and shall wither; and men shall gather him up, and cast him into the fire, and if you abide in me, and my words abide in you, you shall ask whatever you will, and it shall be done unto you.... If you keep my commandments you shall abide in my love.” (*John xv. 6, 7.*) “He that hath ears to hear, let him hear.”

Moreover, what does Paul say respecting the Church of Ephesus? “Take heed to yourselves, and to the whole flock wherein the Holy Ghost bath placed you bishops, to rule the Church of God.... I know that after my departing ravening wolves will enter in among you, not sparing the flock. And of your own selves shall men arise, speaking

perverse things, to draw away disciples after them.” (*Acts* xx. 28-30.) Also of “the Church of God which is at Corinth;” although much of error and schism within it, even going so far as to deny any resurrection of the dead. (*1 Cor.* i., iii., vi., and xv.) Of the church in Galatia, of whom Paul could write, “I wonder that you are so soon removed from him that called you into the grace of Christ unto another gospel, &c. (*Gal.* i. 6.) Of the church in Thessalonica, “Let no man deceive you by any means; for unless there come a revolt first, and the man of sin be revealed, the son of perdition, who opposeth, and is lifted up above all that is called God, or that is worshipped, so that he sitteth in the temple of God, shewing himself as if he were God.” (*2 Thess.* ii. 3, 4.) And what are we told of the once flourishing seven churches in Asia? (*Rev.* i. 11.) and the threatening warning against that of Ephesus,— “Be mindful from whence thou art fallen and do penance, and do the first works. Or else *I come to thee, and will move thy candlestick out of its place*, except thou do penance.” (*Rev.* ii. 6.) In St. John’s time Ephesus and Smyrna were in far better state than Thyatira and Pergamos. And consider the elder [26] Mother churches, Jerusalem, Antioch, &c., and yet none of these churches ever “dared to claim infallibility;” and therefore, according to the Roman Catholic Abp. Redwood, were “not true churches.”

II. OF THE SPECIAL AFFIRMATION AS CONCERNS THE CHURCH OF ROME.

I know full well that the Church of Rome here endeavours to build her assumption upon two or three texts of Scripture; namely,— “*Behold I am with you all days, even to the consummation of the world.*” (*Matt.*

xxviii. 20.)—“Tell the Church. And if he will not hear the Church, let him be to thee as the heathen and publican.” (*Matt. xviii. 17.*)—“Where there are two or three gathered together in my name, *there am I* in the midst of them,” (v. 20.) &c., &c.

1. I thankfully acknowledge, and surely believe that the Church of Christ,—His disciples, believers, faithful servants, sheep, fruitful branches of the true vine, congregation,—will ever exist, and be, and work, wherefore He is ever with them. But, as I have shown in a former letter, (and from the early Christian Fathers,) such does not depend on mere profession, and on names and officers, on forms and ceremonies, and bricks and mortar. And here mark well the solemn words—*Behold, I am with you all days*”, in your “*teaching them to observe ALL THINGS WHATSOEVER I HAVE COMMANDED YOU.*”

(Remember the words quoted above from St. John’s Gospel.) And note *here*, in connexion, what Jesus had early declared :—“Beware of false prophets” (or teachers), “who come to you in the clothing of sheep, but inwardly they are ravening wolves.... Not everyone that saith to me, Lord, Lord, shall enter into the Kingdom of Heaven; but he that doeth the will of my Father who is in Heaven, he shall enter into the Kingdom of Heaven.

Many will say to me in that day, Lord, Lord, have not we prophesied” (preached, taught) “in thy name? and cast out devils in thy name? and done many miracles in thy name? And then will I profess unto them, *I never knew you:* depart from me you that work iniquity.” (*Matt. vii. 15, 21.*) And this is still further illustrated by the Apostle Paul,—“If any man have not the Spirit of Christ he is none of his.” (*Rom. viii. 9.*)

2. Again:—“Tell it to the *Church*”; that is, to the particular congregation, church, or body of disciples or Christians to whom they belong; mutual friends very likely of the two persons [27] mentioned; two or three it may be, in accordance with the direction given in the preceding verse, “Where but those are, and those of the laity also (saith Tertullian), yet there is a church,—that is to say a Christian Assembly.”⁹⁷⁵

3. And no doubt in St. Paul’s time, the Church at Rome was in its integrity. The Apostle thus writes of them :—“To all that are at Rome the beloved of God, called to be saints: ... I give thanks to my God through Jesus Christ, for you all, because your faith is spoken of in the whole world. (*Rom.* i. 7, 8.) But even then, note the Apostles warning to that Church :—“Thou (a wild olive) wilt say, The branches were broken off that I might be grafted in. Well; because of unbelief they were broken off. But thou standest by faith: be not highminded but fear. For if God hath not spared the natural branches lest perhaps he also spare not thee. See then the goodness and the severity of God:... towards thee the goodness, of God, if thou abide in goodness; otherwise thou also shalt be cut off.” (*Rom.* xi. 19–22.) One would naturally suppose that these plain words alone of the inspired Apostle to the Church at Rome would have been sufficient to have put her doubly on her guard, and to keep her from empty and pretentious boasting, and if, driven by these, she still seeks to take refuge on Peter as her rock of infallibility; where, I would ask, was that faculty, that attribute, at the time of Peter’s

975 WC: “Ubi tres, Ecclesia est, licet Laici.” Tertull. *Exhort, ad Castit.*, c. 7.

sad and repeated denial of his Lord,—and of his more considerate prevarication and inconstancy at Antioch, when openly withheld and rebuked by Paul? (*Gal.* ii.)

I have already, in a former letter, written on this particular subject, but I feel much drawn out—in charity, in love, to many of my Roman Catholic friends and acquaintances, to say a few more words on this important matter; for a large number of the Fathers were of opinion that the Rock on which the Church was to be built, was either Christ himself, or, which is much the same thing, the faith of Christ thus confessed by St. Peter. Thus St. Chrysostom interprets “on this rock,” by “on the faith of this confession.”⁹⁷⁶ So St. Augustine says that our Lord meant, “On this Rock, which thou hast confessed, will I build my Church.”⁹⁷⁷ [28]

And in his *Retractions* he tells us that he had formerly interpreted the passage of St. Peter, but that he afterwards thought it more correct to understand it of Him whom St. Peter confessed.⁹⁷⁸ In like manner St. Ambrose had said, “that not Peter, but the faith of Peter, was the foundation of the Church”⁹⁷⁹ And in another place the same Father

976 WC: “*Epi taute te petra. . . tontesti epi te pistei tes homologias.*” Hom. LVI. in *Mat.* xvi.

977 WC: “*Super hanc Petrarn, quam confessus es, ædificabo ecclesiam meam.*” August. in *Johan.* tr. 124, tom. iii. par. 2.

978 WC: “*Non enim dictum est illi Tu es Petra, sed Tu es Petrus. Petra enim est Christus quem confessus Simon, sicut tota ecclesia confitetur dictus est Petrus.*”—*Retract.* i. 21, tom. p.32.

979 WC: “*Fides ergo est ecclesiæ fundamentum. Non enim de carni Petri, sed de fide dictum est, quia porta mortis ei non prævalebunt sed confessio vincit infernum.*”—Ambrose, *De Incarnat. Domin. Sacrament,* c. 5.

writes, that “the Rock is Christ, who granted to his disciples that he should be called *Petrus*, as having from the Rock the solidity of constancy and firmness of faith.”⁹⁸⁰ To the same effect writes Hilary.⁹⁸¹ Also Cyril of Alexandria, Basil of Seleucia, Theodoret, Isidore of Pelusium, Theophylact, and others.

We are all aware of the superior teaching arising from an *object* lesson; also from anything that is real, handy, or well-known, when brought forward as an example in teaching,—such being easily grasped and remembered. Here, then, is one recently to hand by cablegram (and published in your columns), respecting the *Infallibility* of the Church of Rome,—namely, the Beatification of Joan of Arc, a small place in Lorraine; (or, in common language, the raising her up to glory in heaven there to be worshipped by the Church of Rome;) in consequence of this, St. Joan has lately been prayed to by thousands of her bigoted countrywomen! Now, who condemned that unfortunate young woman to be burnt alive at the stake? Why the Church of Rome; her principal Judge was Cardinal Beaufort, then acting with great power, both in England and on the Continent of Europe, on behalf of the Pope, who had also made him his Legate. And, (almost as a curious coincidence,) we have also, here in Napier, a fine historical drawing of her trial, by F. Roe, 57 x 42, (in “Royal Academy of Pictures,” part 4, 1893, p.152,) in

980 WC: "Petra est Christus; qui etiam discipulo suo hujus vocabuli gratiam non negavit ut et ipse sit Petrus, quod de l'etra habeat soliditatem constantiae fidei firmitatem."—Ambros, lib. vi. *In Evangel, Lucæ.*

981 WC: "Super hanc confessionis Petram Ecclesiæ ædificatio est."—Hil. *De Trin.* lib. vi.

which the Church of Rome is duly represented, the great and powerful Cardinal sitting in state on his throne, with his Cross beside him, and the poor girl before him. Poor young woman! she was burnt alive [29] for being a “*heretic*,” at Rouen in 1431, owing to the Church of Rome’s bloody sentence! And now, in 1894, (460 years after,) she is exalted by the same “unchanging” Church to heaven: here we have the two contraries plainly at work; where then is her boasted “Infallibility?”

I believe the written word of God to be infallible: but here great care is to be observed in sifting the precious wheat from its chaff. Jesus said, “Heaven and earth shall pass, but my words shall not pass.”—(*Matt.* xxiv. 35.) “I am in the Father and the Father in me; that I speak to you I speak not of myself. But the Father who abideth in me, he doth the works.” (*John* xiv. 10.) And in the darkest hour the follower of Jesus may be equally sure with the ancient believer—“Thy word is a lamp to my feet and a light to my path.” (*Ps. cxix.* 105.) And with the holy Apostle I will heartily say—“Whosoever shall follow this rule, peace on them, and mercy, and upon the Israel of God.” (*Gal. vi.* 16.) And as I commenced this letter with Scripture warning—to us all—so will I close it,—“Dearly beloved, believe not every spirit, but try the spirits if they be of God; because many false prophets are gone out into the world.” (*1 John.* iv. i.)

I am, &c.,

WILLIAM COLENSO.

Napier, December 6th, 1894. [30]



LETTER V.

“Some said, ‘What is it that this word-sower would say?’” (From the Athenian loungers.) *Acts xvii. 18.*

—“By evil report and good report; as deceivers and yet true.” (St. Paul.) 2 Cor. vi. 8.

SIR.—I now take up the last of Abp. Redwood's assertions

V. That “the Roman Church comprised within its fold more members than all the other Churches put together.”

VI. That “whilst without, dark and gloomy dissensions prevailed, within the Roman Catholic Church all was peace and unity.”

Those three statements I propose to consider separately and very briefly,—being, plainly unworthy of many words.

I. Of the large overwhelming number of the Roman Church.

Not a few modern standard works bearing on this subject, carefully compiled from fair and official sources, show such is not the case; and this I think has been already plainly stated in your columns since I began my letters. I can, however, further appeal to what we know to be correct, viz., the census taken here in our own colony,—in the neighbouring English ones,—and at Home; those, also, of the Reformed Christian European States, as

Denmark, Sweden, Norway, Switzerland, Holland, and Germany (in part); to those also I might add the census of the U.S. of America, of our English colonies in N. America and in Africa ;—all these tell a widely different story; while the myriads—or rather millions comprised in the great Eastern or Greek Church (including Russia), are almost alone sufficient to cope in numbers with the advanced and preposterous claims (as to number) made by Abp. Redwood on behalf of the Church of Rome. I have already (in my first introductory letter) pointed out one fruitful source of error, (either oversight or intentional,) caused by Abp. Redwood counting on all the inhabitants of Roman Catholic countries (as France, Italy, Belgium, &c., &c., in Europe, and the South American States,) *less the few there officially returned as [31] belonging to other churches*, as being Roman Catholics. When we know, alas! too well, that a very large and increasing number in those Roman Catholic Countries belong to no church, and glory in it! (Popery, under the rays of the lamps of science, now beginning to reap the bitter consequences of her doings.) To this I might also add, from my own certain and personal knowledge of the manner pursued by the Church of Rome, here in New Zealand 40-50 years ago, in counting their Maori adherents in high imaginary numbers. Moreover, even if it were so, as Abp. Redwood states, that argument, with me, would have no weight whatever, when considered together with the statement made by our Lord—made, too, in connection with false teachers, “Enter ye in at the narrow gate: for wide is the gate, and broad is the way that leadeth to destruction, and many there are who go in thereto.” (*Matt. vii. 13.*)

IL Of the “dark and gloomy dissensions prevailing without,”—viz., among all other churches.

(1) That “dissensions prevail” —among too many sects and parties (now-a-days styled “churches”)—alas! is too true; and “the cry is still they come”! But who set the bad example? Why Rome herself! (as I have in my former letters shown) by her departure from the faith once delivered to the saints; and by her ever-increasing unchristian additions made to our ancient Creeds of the Church Catholic; and by her many idolatrous Rites and Ceremonies in public worship—witness *the Ordinary of the Mass!*—(here is a sample:) “I have sinned in thought word and deed.... Therefore I beseech the blessed Mary ever Virgin, blessed Michael the Archangel, blessed John Baptist, the holy Apostles Peter and Paul, and all the Saints, and you, Father——, to pray to our Lord God for me.” St. Paul, we know, earnestly warns his converts against the worshipping of angels. “Let no man seduce you, willing in humility, and religion of angels.” (*Col. ii. 18.*)⁹⁸² It is a fearful thing to think, that this voluntary humility and unauthorised worship of inferior beings may beguile of their reward those who worship God only. Once, and but once, in the history of the Bible, do we hear that an angel claimed worship for himself. And he claimed it of Him whose example in worship, as [32] in everything else, we are bound to follow. An angel of

982 WC: The comment note on this sentence, given in the Douay Version, is to good to be omitted:—
“Willing, &c. That is by a self-willed, self-invented, superstitious worship, falsely pretending *humility* but really proceeding from pride.”

exceeding power once said to Jesus, “All these things will I give thee if falling down thou wilt adore me. Then Jesus saith unto him, ‘Begone Satan; for it is written, the Lord thy God shalt thou adore, and Him only shalt thou serve’” (*Matt.* iv. 9, 10.)

(2.) While I allow, with regret, the increasing number of religious sects and parties—I cannot fairly admit their state to be “dark and gloomy”—at all events they don’t think so; (perhaps it would be better for some of them if such were the case and they saw it;) but even here, with all that infirmity, and large amount of small and simple and even foolish errors,—none being “infallible,” they are much nearer to “the Head”—the main central truth of Christianity, than the Church of Rome, whose teaching goes t’other way! In noticing the earnest struggling and striving of many of those sects and parties, one might be led to take up a pregnant saying of Max Muller’s:—“ If we will but listen attentively, we can hear in all religions a groaning of the spirit, a struggle to conceive the inconceivable, to utter the unutterable, a longing after the Infinite, a love of God.” (*Introd. Sc. Religion*, p.14.) Be that as it may, one thing is Certain—THE RIGHT OF PRIVATE JUDGMENT in matters of religion, as plainly taught by our Lord,—adopted by the early Christian Church,—at first held and taught by the Church of Rome, yet afterwards denied by her; and only, after a long and costly and fearful struggle, wrested from her clutches by holy earnest Christian men—Reformers of all grades and of all countries, at the expense of their own lives by fire and tortures; and by them handed down to us, Protestants, and Catholics, alike, as a most precious heirloom! And this is ours and our children’s; and Rome will yet more

surely know it, and its increasing efficacy in the clays to come.

III. "Within the Roman Catholic Church all was peace and unity."

What a nice pleasing picture, or statement! for those who can receive it:—"Ignorance being the mother of (Roman Catholic) devotion." But tear aside the pleasing veil, Ugh! what a sight is revealed! the poet might truly say,—

"Ah! sometimes too much knowledge blights,
And ignorance indeed is blest."

A false alluring soothing kind of peace and unity, no doubt, has existed, (and, may be, does still exist there, resembling that [33] produced by chloroform or morphine,)—"a crying of Peace, peace, when there is no peace"; but at what a cost? Supporting ignorance, reserve, and imposture at the expense of Truth (as Galileo was made to do!) What a story does History reveal concerning the policy and the doings of the Church of Rome! During hundreds of years, the Popes of Rome caused more wars and misery and bloodshed, among Christian States and people, by their unhallowed schemes and practices, than were caused by Napoleon I., or any other tyrant known to History. Further: What of the Jesuits? at one time supported and belauded by the Pope, at another time put down; as, also, the Knights-Templars were; (much as the Freemasons are to-day, only the Pope cannot now touch them!) what of the various and many orders of Friars and Monks, all opposing each other, and ever ready to fly at each other's throats, but all agreed in supporting the Pope, and therefore allowed by him, and so kept together by their

gross, unmanly, unchristian belief in Rome's Infallibility. Nothing that I have seen of late years has more astonished me, than the authorised publications of authentic and genuine State documents concerning the Church of Rome in the Middle Ages, and stored in the British Museum, in the Bodleian, and in other great Public Libraries at Home, and also in the archives of Spain, Portugal, Italy, France, &c., now for the first time permitted to be published; those documents, too, written by trusty Roman Catholic Bishops, Doctors, Divines, and others of that church, as well as by the several ambassadors then at Rome residing, to their respective Sovereigns: these are, and will be, yet, eye-openers to many Roman Catholics.

I am, &c.,

WILLIAM COLENSO.

Napier, December 13th, 1894.

P.S.—As I have now finished with Abp. Redwood's postulates, my next (and last) letter will give your readers my reasons for taking up this matter; in which they will find some strange curious things and anecdotes—as well as food for thought.—W.C. [34]



LETTER VI.

“By their fruits you shall know them.” —*Matt.*
vii. 20.

“In vain do they worship me, teaching doctrines
and commandments of raen.” —
Matt. xv. 9.

SIR,—In fulfilment of my promise in my last letter, I now proceed to give my reasons for entering on this subject. I trust you may deem them fair, cogent, and valid.

Historical: modern: personal.

It is well known, that the Rev. S. Marsden founded the Christian mission in New Zealand, in the year 1814. Twenty years after, in 1834, I arrived in New Zealand, bringing with me a printing-press and type. [And here I may be permitted to remark that it is 60 years this month since I landed in N.Z.; and, also 50 years this month since I landed here in Hawke’s Bay,— where I have dwelt ever since.]

In 1837, a French gentleman, de Thierry, with about 60 emigrants, arrived at Hokianga; he had vainly hoped to be a kind of “king,” or chief paramount over New Zealand, but soon found out his mistake. Being poor, “the Maoris laughed at his pretensions, which were soon forgotten; his real object was to obtain a footing in the land, and then transfer his claims to the French.” (TAYLOR’S “*Ika a-Maui,*” p. 708.)

At the close of the year 1837 I finished printing the New Testament in Maori, 5000 copies in 8vo., containing 356

pages,— at which all rejoiced; and also bound a few copies in calf for Christmas presents to the missionaries; 1000 of the number printed were for the Wesleyan mission at Hokianga.

In 1838 the Roman Catholic missionaries arrived in New Zealand, I copy a brief notice of that event from Taylor's work already quoted:— “In 1837 the New Testament was first printed at the Mission press at Paihia; it has had a remarkable influence on the country, and not only tended to assimilate the language throughout the islands, and fix it, but has been the grand means of destroying heathenism in New Zealand. The same vessel which [35] brought the Maori New Testament from Sydney, where some hundreds of copies had been sent to be bound, also conveyed Bishop Pompalier and his staff to found a mission of the Church of Rome. The Rev. S. Marsden also paid his seventh and last visit to the country; thus, in the same year, three great events occurred:—1. The arrival of the Maori New Testament; 2. Of Mr. Marsden—who then saw the Scriptures in the Maori tongue, the earnest of success and the antidote of false doctrine. 3. The Roman Catholic Church Mission commenced.” (*l.c.*, p.708.)

We soon got to know them and their plans. 1. We, the Church of England Missionaries, with also the Wesleyans, were openly denounced as “heretics—false church,—no church,— rotten branches,—Lutherans” (namely, “followers of an adulterer and excommunicated wretch,” &c.,) and “Calvanists.” 2. The Maori New Testament lately printed was “a false translation.” 3. They haunted all the villages and places at the North,

especially in the Bay of Islands and adjacent interior, Hokianga, Whangaroa, &c; where, in each village after years of labour, we had obtained a firm footing, a Christian congregation, chapel, school, &c. At this time nearly the whole of New Zealand was but little known, save where our missions were established, and the Maoris were also known (from hearsay) to be very numerous in those other and more distant parts. 4. Those Roman Catholic priests and catechists with their Bishop Pompalier were all Frenchmen, and with de Thierry aimed (secretly) at New Zealand becoming a French colony; this (early known to the missionaries) was publicly confessed by their adherents among the Maori chiefs at the signing of the Treaty of Waitangi (see that book, pp. 27, 34).

Soon after their arrival they imported from France, a very large picture (perhaps 30 inches by 15 inches, either a copperplate engraving or lithograph, but I think, the former). It represented a fine flourishing full-branched vine, with a figure of Jesus on the trunk at base, and with the names of all the Popes of Rome from the earliest down to date on the sound branches, while all around it on both sides were scores of falling withered branches bearing the names of ancient heretics, together with those of Wickliff, Luther, Melancthon, Knox, Calvin, Huss, Ridley, Latimer, Cranmer, Jerome of Prague, Wesley, &c., &c.,—and all around on the ground was flaming fire depicted, into which those withered and severed branches were dropping; and with, of course, explanatory verses from *John xv*. Those pictures, with [36] others of a similar tendency, were sparingly distributed among the heathen Maoris who joined them, who were to use them

privately; *I, however, saw them*; and certainly from their novelty, their somewhat natural appearance, and quasi agreement with the words in our own Maori New Testament, made a stir, a sensation among the Maoris.

Finding that the Roman Catholic priests were becoming more and more bold and offensive,—partly owing to their want of success in drawing away our Christian Maoris, and, also, to their vexation and hate increasingly shown concerning the Maori New Testament, I deemed it right to commence operations; so, in 1839, I wrote a book in Maori on the Errors of the Church of Rome; for this purpose using standard works, mainly their own books, especially their own “Catechism of the Council of Trent,” a bulky volume, published by command of Pope Pius V. and issued from Maynooth College.

A branch “Religious Tract Society” was now formed at the Bay of Islands, (then the chief port and settlement in New Zealand,) and the following honoured names were those of its first Committee: Rev. W. Williams (afterwards first Bishop of Waiapu), Mr. J. Busby the British Resident, Dr. Ford, Messrs. Wade and Baker of the Church Mission, and Captain Clendon, and Mr. G. Mair, old and respected settlers in the Bay; and, in 1840, my book being ready for press, and submitted to a chosen few, Maori scholars,—the Committee decided that it should be published; and 8000 copies were printed, in two parts, one at Sydney, and one at Hobartown, which on their arrival were divided as follows: 4000 to the Wesleyan Mission, 1000 to the Southern District Committee Church Missionaries, 1400 to the N.Z. Religious Tract Society, and the remainder to the

Reverends Maunsell, and Taylor, other Missionaries (subscribers), and to Messrs. J. Busby and G. Mair, for distribution. In after days we heard of great good and service having been effected by these winged messengers; in not a few places the Maoris learnt them by heart.

And here, I think, I may give a few anecdotes of the Roman Catholic Bishop Pompalier, and his conduct towards us of the Church Mission.

During his first years of residence at Kororareka (now Russell) in the Bay, he occasionally travelled across the island to Hokianga, and would halt (perhaps to bait) at Puketona, or at [37] some other of the small inland villages belonging to the Chief Hoani Heke (afterwards so well-known in our early Colonial Maori History), and while the meal was preparing, as was his and their Roman Catholic wont, he would set forth the necessity of leaving the Church of England and joining the Church of Rome. Hoani Heke did not like this, but with true Maori courtesy allowed the stranger to talk; and on one occasion promised to give the Bishop on a future visit the names of some of his tribe whom he might enrol as followers. I believe this promise brought a much earlier visit and with him a priest; so, after greetings, &c., Hoani Heke was reminded of his promise; he replied, his people were all absent in the woods, &c.; however, on pressing request, their names were all duly given, and taken down by the priest, and ran much as follows :—"ko Kauri, ko Matai, ko Mangemange, ko Raupo, ko Tupakihi, ko Mahoe, ko Tawa, ko Taraire," &c., &c., more than twenty in all, and the Bishop was to see them on his next

visit, he letting Hoani Heke know beforehand of the day; and so with many thanks the Bishop went on his way — rejoicing! Ere long Hoani Heke was duly informed of the appointed day, and took good care to be himself absent when the two Roman Catholics arrived; when they were plainly told, amidst torrents of laughter on the part of the Maoris, that those names were those of the trees and shrubs and herbs, of the adjoining woods, &c. Guess what followed! The fane of Hoani Heke's exploits went far and wide among the Maoris, and I am not sure it was not acted over again in other places! Here I should remark that such names for men and women were very common among the Maoris, so that the Bishop might have been easily deceived. I was told, that the fun and laughter was more intense and continued on the day in which Hoani Heke gave the names with much gravity, after the Roman Catholics had gone; it was kept up all night!

A second anecdote I received from Governor Hobson, The Roman Catholic Bishop Pompalier was fond of going about in an ostentatious manner, (very different to all residents in the Bay,) full-dressed in coloured robes, with big gold neck-chain and crucifix, (of course, all such told upon the poor half-clad Maoris). Shortly after the signing of the Treaty of Waitangi, the Bishop went in his barge to visit the Governor, then residing in Captain Clendon's house at Okiato, about 5 miles from Kororareka, up the inner harbour. The introduction over, the Governor began [38] with, "Why is it, Bishop Pompalier, that you Roman Catholics always keep hounding the Church of England Missionaries? I know these seas well, and there are lots of islands yet unvisited

by Christian Missionaries; surely you should go to them?" The Bishop bowed, with the grace of a Frenchman, and replied,— "One thing, however, Your Excellency will permit me to say, I feel assured, and that is, by our so doing (as you say) we serve to keep them to their duty." I may remark, the Governor frequently attended divine service on Sundays, by boat, weather permitting, at Paihia Mission Chapel, some three miles distant. Other anecdotes shewing the man will be found in the little book, published by the Government, "Signing the Treaty of Waitangi," pp.13, 14, 31, 34, &c.

In 1841, early in the summer, I again visited the Maoris on the outer E. Coast as far as Whangarei, returning by the interior and Te Kawakawa. On arriving at our Mission station, I was informed by the Rev. H. Williams that the R.C. priests at Kororareka had sent us a challenge to meet them there, for a public discussion on church matters in Maori, and that he had accepted it. (We had long been desirous of this, and had several times endeavoured to bring it about.) This meeting took place on Tuesday and Wednesday, October 26th and 27th, in the open enclosed area in front of their house,—they having the advantage of their raised verandah also, screening them from the sun. On their side were four R.C priests, an Irish schoolmaster, and a Mr. Warburton—a settler, or visitor: on ours five missionaries, but only Rev. H. Williams and myself took active part in the discussion; a large number of Maoris and Europeans were assembled around.

On the first day Mr Fitzgerald was chosen chairman; and on the second day Dr. Davies. Each side was to speak a

quarter of an hour at a time by the chairman's watch. It was a curious sight at the opening to see the principal chief of the place, Rewa, (a fine commanding man, well-known to us all, and conspicuous at Waitangi, at the signing of the Treaty, but still a heathen,) arise, and addressing the Maoris in a proper speech, said,—this meeting was not about land (referring to that held at Waitangi) but church matters between us, two peoples and two contending parties, and that they were only to be quiet hearers. His speech and the occasion of it strongly reminded me of the greater [39] meeting at Nice under the unbaptised Emperor Constantine. [I now find that I have copious notes written at the time of what then took place.] At the beginning the priests tried hard to alter the terms, or course of discussion, which had been agreed on in writing—but were obliged in fairness to give way. I still have the papers—sheets of 20 accusations, written by myself in English and Maori, read by the priests, and returned to us at the close. All of their side took part in the proceedings; two of the priests spoke colloquial Maori fairly—but too often rashly; and all were continually raising their stock arguments (very suitable for their Maori hearers)—as, of Luther, excommunicated and living in adultery with the nun Catherine (his married wife): of Henry VIII., and of the Church of England originating with him: of our Bishops, Cranmer and others, being excommunicated and put to death as very wicked men—heretics: of our false Maori translation of the New Testament: of our improper spelling of common Scripture names, as Peter, Paul, Mary, Jesus, Christ, &c. (our mode being the common Maori phonetic pronunciation), and theirs (from sheer opposition —as in

many other instances,) their written one, (retaining the vowels as in English, though differently pronounced, &c.)—and at last, denying their worship of the Virgin Mary! which statement, we, from their own printed Maori leaflets produced, showed to be false, and their own Maori disciples (whom they had gathered from all places around) raised an outcry against them! They were much vexed at our producing their outrageous picture of the Vine, (I having got a copy,) and on our lending it to them tried hard to retain it, and would have kept it but for the audience, whites and Maoris, who acted fairly throughout. Our Christian Maoris had brought their New Testaments with them, but the priests would not allow our translation to be used, ever ridiculing it; and we were obliged to take up verses as wanted by us from the Douay Version, translate off-hand into Maori, write down, and hand over to them for their inspection; which took up much time; and when done and read out, was found by the audience (European and Maori) to be just the same as in our published New Testament. This raised a storm from them against the priests, who by this manner of subtle acting gained time; they rarely made any reference to the New Testament. One of their party, however, (a Monsr. Lepal,) on one occasion during the second day's discussion, rose and allowed our rendering of [40] John vi. 53-59, in our Maori version to be correct, and seemed to rebuke his *confreres*, in French,—but they altered not.

Now it was very clear that they were not only the bitter professed enemies of our Mission, but in their daring and open blasphemy against our Maori version of the New Testament, they were also enemies of our Faith and of God, and we must therefore treat them accordingly. And

so it came to pass ever after, that in my frequent travelling throughout the interior, wherever I fell in with any of those Roman Catholic priests we should have a discussion; for I invariably found them doing all they could to traduce us, deny our belonging to the Christian Church, asserting our Maori version of the New Testament, of the Psalms, and other Scriptures, to be false, and unsettling our converts from heathenism. I could relate some very striking circumstances, but want of space forbids it. I may, however, say truly, (though some, no doubt, will accuse me of rank egotism,) that I was, (or felt,) on every occasion more than a match for them; because (1) of my superior knowledge of Maori; (2) having myself printed the Maori New Testament with many other Maori books, I was looked on by the Maori chiefs and people as a "*tohunga*" of a higher grade (3) having the Maori New Testament always to refer to: and (4) my belief in the New Testament and Faith in God.

One painful instance I may however mention: those young Roman Catholic priests (some of them) in travelling among the Maoris, were always very ready to lay hold of infants and children and baptize them, not infrequently against the wishes and protests of their parents, and also in their absence. This conduct of theirs was greatly disliked by the Maoris; sometimes, however, the priest endeavoured to palliate it by little presents of trinkets, and such like. On one occasion of my revisiting a village in the Ruatahuna district, far away in the interior, (in 1843,) I found a middle-aged chief having a little bronze crucifix tied to a string and fastened to his leg at the ankle, and trailing it in the dust and dirt behind him; while his children had also a crucifix, and some

brass medals fixed in the same way to their legs, and were so dragging them about. On inquiry I found, that all this was done by him to show his utter disbelief in the *tapu* (or sanctity) of those things, and to show further his detestation of the Roman Catholic priest's conduct, who had recently passed there (in his travelling), and without asking, and in the absence of the parents in their cultivations, had baptised the children, and then hung the crucifixes and [41] medals about their necks. I redeemed those images from desecration, and have them still. One of the medals has the Virgin and Infant, with "*Mater bona consilii*," and the other, "*Sancta Philomena ora pro nobis.*" I afterwards met with this Roman Catholic priest, when he asked me to rebuke that chief for his defilement of sacred things. I replied, NO, for I did not wonder at it; at the same time I did not like it; yet, if, as I had heard, he, the priest, was in the habit of sticking up the big cross he wore round his neck and kneeling before it and worshipping it, and I got it, I would not only drag it at my heel, but trample it in the dust.

I am, &c.,

William Colenso.

Napier, December 21st, 1894.

LETTER VI.—PART 2.

On my return to the Bay in the autumn of 1842, (after my long rambling journey occupying some months, from Hick's Bay and E. Cape to Poverty Bay and Waikaremoana and the Urewera Country and Waikato,) I found, among letters and other matters lately from Home, the full and authentic account of the recent public

reception of three Roman Catholic priests by the Bishop of London into the Communion of the Church of England, two of them coming from Lisbon, and one from Italy; this event took place in St. Paul's Cathedral, London,⁹⁸³ and as the whole ceremony was very interesting and profitable, giving in full the questions and answers then put to them, and their entire renunciation of the Church of Rome, I determined to translate this narration also into Maori, and print it at the Mission Press. When this tract was issued, the hubbub and uproar of the Roman Catholic priests at Kororareka was considerable, of course with them it was all lies, and loud were their denunciations respecting me! Walter Scott, with true insight, might well write

“For, as the vassals of her will,
Such men the Church selected still,
As either joyed in doing ill,
Or thought more grace to gain!
If, in her cause, they wrestle down
Feelings their nature strove to own.” (*Marmion.*)

[Of this tract I have several copies still left.]

In the summer of 1843, the late Bishop Williams of Waiapu, his son (our present Bishop-elect), and myself first visited these parts; landing at Castle Point, and travelling together northward as far as Te Wairoa—thence they two on to Poverty Bay, and I (as before overland by Waikaremoana) to the Bay of Islands. In the following year, 1844, I was sent hither (Hawke's Bay) by the Bishop of New Zealand, Dr. Selwyn, to permanently

983 WC: In April, 1841.

reside. At first I had much, very much, to endure from powerful heathen [43] Maori chiefs, but in the course of a few years, under God's blessing, things got better, and prosperous times were at hand; and then (as a matter of course) the Roman Catholic priests, true to their instinct, arrived! and gave me and the rising Christian Church much trouble. It was truly a bitter time of blasphemy and rebuke! lasting for some years. It seemed to me, (having experienced both states,) that heathenism and cannibalism were better states than this unhallowed opposition of the Church of Rome, carried on, too, in the name and guise of Christianity!

Here, at the Mission Station at Waitangi in Hawke's Bay, at my own private printing press, I printed another tract I had written against Rome,⁹⁸⁴ (again showing her declension from the Faith and her principal errors,) which strengthened my Christian Maori teachers, now nearly thirty in their several villages, when teased by the Roman Catholic priests and apart from me. (I having to attend to and visit the Maoris dwelling between Moeangiangi on the N., to Cook's Strait on the S., with Manawatu above the Gorge, Patea, Tarawera, and Taupo.) In common with the Church of England, missionaries at Te Wairoa and Poverty Bay, I had plenty of additional uphill labour through the Roman Catholic priests, mostly, however, caused by their lying and beguiling letters to my Christian teachers, and to the still heathen chiefs, which letters were loyally brought to me; also, by letters (more rarely) direct from themselves, which I had to answer—

984 Colenso printed an anti-Roman Catholic tract at Waitangi in 1849 (Books in Māori #374).

in a way they did not like; so that, at last, they had the hardihood to write to Bishop Selwyn, against me, viz., my teaching concerning them! and the Bishop's reply, written from the Rev. J. Hamlin's at Te Wairoa, (after hearing of their malicious doings there, and at Poverty Bay,) served to stop all such letters from Roman Catholic priests for the future. Moreover, respectable settlers coming in to Hawke's Bay district early in the '50's, also caused them to be much more wary.

I may just mention my last public discussion with one of them, a man (a gentleman) long well-known among us, the late Father Reignier, shortly after his arrival here in Hawke's Bay; and this took place on the open beach between Petane and Tangoio, where we, with our respective Maori travelling parties met by chance, he travelling north, and I south, returning to Waitangi; our discussion, however, was not a very unfriendly one, and scarcely lasted an hour, as the day was waning. Father Reignier and myself often met afterwards, in travelling, &c., but [44] not to dispute; and of him to the last I ever had a high opinion, as a neighbour, a fellow-settler, and a Roman Catholic priest, but he was an educated Frenchman.

In 1849, the Roman Catholics at Kororareka, having some time before obtained a printing press, published their first thick Maori book of 60 pages; and to my astonishment it contained the whole Gospel of St. Matthew: as far as I know the *first time* that Rome ever published a whole Gospel in a "barbarian" tongue! The Roman Catholic priests had often declared that our (heretical) success was entirely owing to the printing

press, and the “false” Maori New Testament we had published; and so, to meet the demands of their Maori adherents¹ they were driven to supply one Gospel! Unfortunately they had added their usual notes about St. Peter and the Church; and worse still, some hundreds of pages of very heavy reading interspersed with a large number of foreign and strange long words (pseudo-Maori) concerning their church and its services, saints’ days, Litanies, Catechisms, the 7 Sacraments, a complete List of Popes, beginning with St. Peter, &c., &c. [Their book was of small size; like a thick Hymnbook: I possess copies.]

But I must hasten to conclude: before however that I do so, I would remark, that until the last Council of the Church of Rome, when two more additions were made to her ever-growing creed, namely, (1) the *Immaculate Conception*, and (2) the *Infallibility of the Pope*, (both being not only innovations but expressly spoken and written against by the Early Fathers of the Catholic Church)—I did venture to hope, that, with the increasing and marvellous lights “from above, from the Father of Lights,” shed liberally on all sides by Science, Truth and Reason; and her constrained abandonment of much of her old abominable ways of fire and torture and curse, that she might perchance see her theological errors and reform; hut when I found that, in spite of the earnest protestations and arguments of the judicious Roman Catholic minority at that last Council headed by the learned Dr. Dollinger and other prelates, she refused to listen to them, and, on their leaving her now still further changed communion, excommunicated them, I gave up all hope for her, and considered her now inexorably

doomed by her own acts and deeds:—"Semper eadem" (always the same) ! therefore she cannot alter or recede, and her boasted "Infallibility" is the fatal rock on which she must ultimately be wrecked! Thus writes one of their own famous [45] authors, Pallavicini,— "The whole of our Faith rests upon one indivisible article, namely the infallible authority of the Church. The moment therefore we give up any part whatever, the whole falls; for what admits not of being divided, must evidently stand entire or fall entire." *Hist. Conc. Trent.* iii., iv., 6.

It is more than 50 years since I first gave serious attention to this subject; and I have studied it often and long and thoughtfully since, with many years of painful trials and experience; and my matured convictions strengthen me in my belief, that the Church of Rome is not the Catholic Church of Christ; but rather—as our martyred forefathers declared at the stake, with a fearful fiery trial and death at hand,— "ANTICHRIST"; and as the Irish Church has it, in her 80th article,— "the Pope is that Man of Sin foretold in Holy Scripture."

And our Queen Victoria, in the presence of the assembled estates of the realm, on November 20th, 1838, took a solemn oath, of which this is part:—"I, Victoria, &c., do solemnly and sincerely, in the presence of God, testify and declare, that the Invocation or Adoration of the Virgin Mary, or any other Saint, and the Sacrifice of the Mass, as they are now used in the Church of Rome, are Superstitious and Idolatrous."

Having lately seen in the London papers a full account of what Cardinal Vaughan was pleased to say at Preston, on the 10th September last, in his inaugural address on "The

Union of Christendom;" I should like to say a few words upon it. He dwells with delight "on the marvellous changes effected during the last 50-60 years in the Church of England," and says,— "the movement continued to spread, lodging itself in Anglican homes and convents, in schools, churches, and even Cathedrals, until it was rapidly covering the country. Contrast the Churches of the Establishment of 60-70 years ago, with *the present churches, which were often distinguished only with extreme difficulty from those belonging to the Church of Rome.* The doctrines of the [Roman] Catholic Church, which had been rejected and condemned as blasphemous, superstitious, and fond inventions, had been re-examined and taken back one by one, until the 39 articles had been banished and buried as a rule of faith."

Bravo, Vaughan! Well done as an unblushing henchman of the Pope of Rome. The old cry, "*Semper cadem!*" I well recollect the outbreak of that pestilent schism at Oxford, and the publication of the infamous "Tract XC," (a copy of which I have still,) and which I, then, young as I was, [46] termed "THE BLIGHT OF THE CHURCH OF ENGLAND;" and so sure enough it has turned out, like a *Phylloxera* or *Oidium* eating into the vines,—not only at Home but also here in the Colonies! But what a humiliating position for those Ministers of the Church of England, to be thus taunted, and twitted, and talked to and of, by a Servant of Rome! Ministers, who were only admitted as such through their professed solemn adherence to those very 39 Articles! See what comes of coquetting to Rome! of longing after discarded medieval and monkish millinery and frippery and practices and hymns and symbols and superstition! But England is not

lost yet; she is Protestant to the backbone, notwithstanding the said defection of many of the sworn officers of her Church army, the sturdy rank and file will have yet to be considered, and the numerous and strong parties of Noncomformists may yet, (and again I) prove to be able defenders of the faith against the vaunted and discreditable supremacy of Rome. I am glad to see the Bishop of Manchester, in his opening address at the Manchester Diocesan Conference, come boldly and truthfully forward and reply ably to the vainglorious Cardinal. In the close of his address the Bishop says,— “Obviously the Romish claims were based on arrogant assumption and ignorant acquiescence.... This was their genuine belief, and to promote reunion of Christendom they of the Church of England could not profess to believe what it was impossible for them to believe. They could not purchase peace by the sacrifice of truth, freedom, and self-respect. If there were such clergy in the English Church as those described by Cardinal Vaughan, who were teaching and practising the superstitions which the 39 Articles condemned, their position was indefensible, and the Church of England did not wish to keep them.”

In closing, I should like to say a few words referring to some of the *ex parte* statements that have appeared in our papers since I took up my pen,—although of most of them it may be truly said, “*Ignoratum per Ignotius*”⁹⁸⁵ and, as an old rule, I never condescend to notice anonymous scribblers. But, to allow some of these to remain

985 WC: That is, A thing not understood by a thing still less understood.

unanswered, would be tantamount to assenting to error, and to approve of jackdaws remaining dressed up in peacock's feathers!

One writer, subscribed "Mickey," (but said, by the man in the street, to be Father Proteus under a pseudonym,) very learned [47] and lovingly writes:—"Mr. Colenso goes on to say, that Jesus used Greek in addressing Peter." (In *Matt.* xvi. 18.) "Poor old man, is it possible that he could render himself so supremely ridiculous in making such a blunder? Why, our Divine Lord most probably never spoke a word of Greek during his sojourn on this earth; no sir, not one word. The language he used was Syro-Chaldaic, and in that language how do the words 'rock' and 'Peter' read? There is exactly the same word for both, namely, '*Kepha*.' Hence the text would read as follows:—"Thou art '*Kepha*,' and on this '*Kepha*' I will build my Church,' &c. So you see, when Christ used the sentence there was not the least room for doubt.... If Mr. Colenso in his dotage had the presumption to go from English to Latin, Italian, and Greek, he might have gone one step further and taken the original Syro-Chaldaic. But, of course, 'there is none so blind as he who *will* not see,' and my shallow opponent seems determined on not seeing.... So, in conclusion, I have only to repeat that in the language of Christ, (Syro-Chaldaic,) there is not the least difficulty, the text being as clear as the noon-day's sun."

To this, omitting the sugar-plums, I reply, (1) That Jesus and the Apostles, I have no doubt, knew and occasionally used the Greek language, then commonly used there, profane history tells us this; the Jewish writers of that

age, Philo Judus, and Josephus, wrote their works in Greek. (2) That Jesus and the Apostles used, and quoted from, the LXX. (or Greek translation of the Old Testament) in their addresses to the people, is clearly shown in the New Testament. (3) That the writer of St. Matthew's Gospel put the words spoken by Jesus on that occasion into grammatical Greek, and so I (not being wiser than the inspired writer) quoted them: (4) that "Mickey's" rash assertion, about the Syro-Chaldaic (or Hebrew) version of the New Testament containing "exactly the same word, *kepha* in both places for *petros* and *petra*," won't stand examination! For (1) we have no such codex or version remaining; (2) If "Mickey" means the *Syriac* translation, (commonly called *Peschito*,) this probably was made "at the end of the *first* or beginning of the *second* century after Christ." Now the second *kepha* in the *Syriac* version is shown to be feminine by the use of the feminine pronoun, whereas the first *kepha* must be masculine being a man's name. Hence the difference between *petros* and *petra* is not quite lost in the *Syriac*, though that language does not admit of the same changes of [48] termination as the Greek does. Now, "Mickey," dare to be honest for once; free confession will do you good (you know). Did you know of this when you wrote, yet concealed it? or, Did you know nothing of it, save the *bit* you have been taught parrot-like by your Roman Catholic teachers? choose the horn for impalement. Arrah! "Mickey," you will have to go to school again, and take a lower Standard. Now take an old man's advice, —" *Look at the river before you cross the ferry.*"

Again a warning is given: that I (or we) only use and quote from “sceptical works, as Hume, Gibbon,” &c. I have them, and have read them with pleasure and profit, but I never quote them in arguing with Roman Catholics; No, no: as indeed all my quotations taken from their own version of the New Testament and the early Fathers of the Catholic Church before Rome fell away, clearly show.

Further, we are told, that “there is no salvation for us outside of the Roman Church” The old Testament prophets and Peter preached the contrary,— “Whosoever (singular) shall call on the name of the Lord shall be saved.” (*Acts ii. 21.*) whether in a church or out of it. Again, ye Roman Citholics, hear St. Peter,— “In very deed I perceive that God is not a respecter of persons; but in every nation he that feareth him and worketh justice is accepted with him,” (*Acts x. 34, 35.*) And also St. John, “And the Spirit and the Bride say, Come. And he that heareth let him say, Come. And he that thirsteth let him come, and he that will, let him take the water of life freely.” (*Rev. xxii. 17.*)

My task is done. I trust I have pretty faithfully fulfilled my promise; and though I have in several places used strong language, yet I have always endeavoured to write truly— “nothing extenuate nor set down aught in malice.” I should like to give more fully anecdotes and memorabilia of the early times; also our first and early big discussion with the Roman Catholic priests from my original and authentic notes; and also more concerning my many other discussions with them single-handed, copied from my journals; likewise the heads of my

several published tracts against Rome, but this cannot now be. Indeed, as it is, I feel I have trespassed largely on your kindness and the columns of your paper, but the grave importance of my subject must be my excuse. I headed this letter with words of warning from our Lord suitable to this very subject, and I will now close it with another from him to the Jewish Church, (and to all churches,) showing how “they [49] were making void the word of God by your own tradition, which you have given forth. And many other such like things you do.” (*Mark vii. 13.*)

I am, &c.,

WILLIAM COLENSO.

Napier, December 20th, 1894.



THE CLAIMS OF THE ROMAN CHURCH.

PART II.—HISTORICAL.

LETTER I.

“Veritas liberavit vos: = The truth shall make you free.”

—*John viii. 32.*

SIR,—A week ago I saw it advertised in our Napier papers—“The subject of Father Grogan’s discourse in St. Patrick’s will be ‘St. Augustine’s Doctrine,’ the Foundation of England’s Greatness, with a little more

light thrown upon the erroneous teaching of the Rev. Dr. Clifford," This, I think, was also its second week's announcement. Dr. Clifford, a passing tourist, was here on Sunday, August 1st, on which day he preached twice, leaving for Wellington on the following day, I have not heard what Dr. Clifford said on that occasion, neither do I know what Father Grogan may have said at St. Patrick's in reply; and I have been waiting to see some notice of the same in our papers, but have not seen any. Although both Dr. Clifford and his preaching are unknown to me, I cannot but suppose from his position in society,—his scholarship,—his age and his fame as a preacher and orator, that he must have well understood his subjects, and would not—could not—preach anything save what he believed to be the truth; therefore I should like to know what Father Grogan calls "his erroneous teaching," and also Father Grogan's answer thereto.

But it is not my intention at present to enter fully on any doctrinal subject or radical differences between the two ancient Churches, the Roman and the English; but merely to call the attention of members of both Communions to a few historical facts relating to both. For while there is a large amount of truth in Father Grogan's short motto-like statement, that "St. Augustine's Doctrine is the foundation of England's Greatness"; two things must be here ever borne in mind, —first, that "St. Augustine's Doctrine," (that of the Church of Rome of that day,) was not the same as this of Rome of the present day—very far from it, as most [51] of the grave errors of Rome are comparatively of recent date, and had no existence in the Romish Church for at least 1000 years after Christ. And, second, that there were Christians and churches and

Bishops in Britain hundreds of years before the arrival there of Augustine. These are the two main facts, which our friends the Roman Catholics in their teaching so commonly avoid, and it is more particularly with reference to this second subject of mine, that I now write this letter. And probably I could not do better than first to narrate briefly that delightful little dramatic and truthful story, (so well known to many of us,)—of the monk Augustine being sent by the Pope of Rome as a missionary to England.

Gregory the Great, afterwards bishop of Rome, was walking one day in the year A.D. 575 in the Forum, when he observed some boys (slaves) put up for sale “of a white body and fair complexion, and with hair of remarkable beauty.” He inquired from whence they came, The slave-owner answered, “From Britain.” Are they heathens or Christians?” The answer was “Heathens.” “How do you call their nation?” said Gregory. “Angles.” “Tis well,” said Gregory, “they have the faces of Angels. What is their province?” “Deira.” “They must be saved,” said Gregory, “*de ira Dei.*” (= From the wrath of God.) Years passed, and though we may be sure Gregory often thought of those bright faces in the Roman Forum, yet no active step was taken in the way of converting the “heathens” in Britain. In the year A.D. 596, however, more than 20 years after, Gregory resolved upon a mission to Britain, and for its head he chose Augustine.

And here, to understand that more clearly, it is well to bear in mind the position of England at that time. England was then divided into several States or

Kingdoms, each belonging to a distinct people. For the Romans (who under Claudius Cæsar first invaded England A.D. 43, landing at Ebbsfleet in Kent, and who had remained in possession for about 300 years,) having finally left the country, the Britons having lost their protectors were soon again assailed by their old enemies their neighbours; when in their extremity they invited over the West Saxon race to help them; they accordingly came in large numbers, and did so; and being the stronger party became their rulers. Now these West-Saxons were heathens, and to them Augustine came, landing also at Ebbsfleet. But Bertha, the wife of their King (Ethelbert) [52] was a Christian woman, the daughter of Charibert King of Paris; she had brought with her Luidhard Bishop of Senlis, "to practice her religion and preserve her faith." Ethelbert received Augustine kindly; very likely Bishop Luidhard and the Queen Bertha had opened a way for his success. (The full description of their arrival, and preaching before the King through interpreters, as given by the Catholic historian, is interesting.) The King gave Augustine leave to carry out his mission; this he did with the help of his large party of missionaries said to be 40 in number, and through their labours many who saw and heard believed and were baptised, the most important being King Ethelbert himself; this event took place in June A.D. 57. [I shall have to refer again to this date.] Soon after this, Augustine, at the Pope's direction, crossed over the sea to Gaul, and was there consecrated by Archbishop Vergilius, as Archbishop of the English (namely, the West Saxons); he returned to Canterbury, and shortly after he reported to the Pope at Rome respecting the British Bishops; inquiring, "How am I to

deal with the Bishops of Britain?" The Pope replied—"They are all committed to the care and authority of Augustine." [Here, I note, in passing, that the letters to and from Augustine and the Pope are well worthy of study—so plain, simple, and full.] But here arose the difficulty; the British Bishops positively refused to admit the supremacy of Rome. I quote the exact words of the Catholic Saxon historian Bede:— "Augustine, with the assistance of King Ethelbert, drew together to a conference the Bishops, or doctors, of the next province of the Britons, at a place which is to this day called 'Augustine's Ac' that is Augustine's Oak," [at Austcliffe on the south bank of the Severn,] "on the borders of the Wicci and the West Saxons; and began by brotherly admonitions to persuade them that preserving Catholic unity with him they should undertake the common labour of preaching the Gospel to the Gentiles. For they did not keep Easter Sunday at the proper time, but from the fourteenth to the twentieth moon; besides, they did several other things which were against the unity of the Church; when, after a long disputation, they did not comply with the entreaties or rebukes of Augustine and his companions, preferring their own traditions; saying they could not depart from their ancient customs without the consent and leave of their people. They therefore desired that a second synod might be appointed, at [53] which more of their number would be present. This being decreed, there came (as is asserted) seven Bishops of the Britons, and many most learned men, particularly from their most noble monastery, which in the English tongue is called Bancornburg, over which the Abbot Dinooth is

said to have presided at the time.⁹⁸⁶ After much talk, Augustine said to them, “You act in many particulars contrary to our custom or rather to the custom of the universal Church, and yet if you will comply with me in these three points, viz., to keep Easter at the due time, to administer baptism, by which we are again born to God, according to the custom of the holy Roman Apostolic Church; and jointly with us to preach the word of God to the English nation, we will readily tolerate all the other things you do, though contrary to our custom.” They answered, they would do none of those things, nor receive him as their Archhishop.—They owed no obedience to the Bishop of Rome, but were under the government of the Bishop of Caerleon-upon-Uske, who was their overseer under God.” Not long after Augustine died, A.D. 604 or 605 he had converted multitudes in Kent, and his noble work on earth was finished. The West Saxons, however, did not long retain their new faith, for, on the death of King Ethelbert, his son and successor Eadbald refused to accept Christianity, and his people joined him. So, (as the late Bishop of Lincoln, in his *Lectures on the Irish Church*, says,) “the mission of Augustine was comparatively sterile in England, whether we regard extent of space or duration of time—Truth requires us to declare that Augustine ought not to be called the Apostle of England, but the title ought to be given to St. Columba and his followers.”

986 WC: This is now called Bangor-Iscoed, Flintshire, to distinguish it from the city of Bangor in Carnarvonshire. This monastery—of Christian monks and college students—was one of the most celebrated in Britain.

In fine, let me briefly show the foundation of the Christian Church in Britain. This can be traced to three sources:—

(1) The ancient British Church; (2) The efforts of Irish and Scottish missionaries, who converted the Northern and Midland Counties; (3) the mission of Augustine, who evangelised the pagans south of the Thames—principally in Kent (already treated).

“When was the Christian Faith first preached in Britain? is a question,” writes Professor Bright, “which it is impossible to answer.” “We see,” says the historian Fuller. “the light of the [54] word shined here, but see not who kindled it.” In the ancient Welsh *Triads*,⁹⁸⁷ Bran the blessed, the father of Caractacus, is said to have brought the faith to Britain. The writings of the earliest period of the Church’s life are necessarily scarce and obscure, but the early Christian Fathers agree that long before the year A.D. 200 the inhabitants of Britain were “subdued to Christianity.” In the year A.D. 363 St Athanasius reckons the Britons among those who were loyal to the faith. Tertullian (A.D. 193-216) says, “Christ is preached among the barbarians. He reigns among people whom the Roman arms have never yet subdued, in the furthest extremities of Spain, and Gaul, and Britain.” In the beginning of the fourth century, during the reign of the Emperor Diocletian, the British Church, in common with the Church in other countries, suffered the largest and bloodiest persecution it had yet encountered. Men, women, and striplings were called upon to renounce the

987 WC: The Triads are historical poems of very ancient date, in which the facts are grouped in threes.

faith, or suffer execution. During this period Aaron and Julius, two British Christians, suffered death at the hands of the Romans at Caerleon-upon-Uske, in Monmouthshire. But the chief place as first martyr of the British Church is always given to Alban, a Roman of noble birth, who suffered death at Verulanium, the Roman name of the present town of St. Albans; the year of the martyrdom is supposed to be A.D. 304. Ten years later, A.D. 314, we have evidence of a Church settled in Britain; records exist which show that at a Church Council summoned by Constantine (the Emperor and not by the Pope) at Arles, in France, in this year, three Bishops from Britain attended and took part in the deliberations; their very names were preserved to us—they were Eborius, Restitutus, and Adelphius. British Bishops were also present at Church Councils held at Sardica, A.D. 347, and at Ariminium, A.D. 359.

One of the most celebrated missionaries to Britain was St. Columba, an Irishman, who was brought up in the monastery of Clonard in Ireland. On the eve of Whitsunday A.D. 564, Columba landed in the Island of Iona; for generations both Irish and Scottish kings came thither to be crowned by Columba and his successors.

The actual stone on which they were crowned may be seen to-day in the Abbey of Westminster beneath the Coronation Chair. I mention him, St Columba, especially (though there were [55] others—equally celebrated before him) for two reasons,—the lately erected Presbyterian or Scotch Church at Havelock N., in Hawke's Bay, has been named after him; and, recently, on the 9th. of June last, the thirteenth centenary

celebration by the Church of Scotland commemorative of St. Columba took place in the island of Iona, which was largely attended by clerical gentlemen and many others. Divine services, both in English and Gaelic were held in the nave of the ancient Cathedral, which had been prepared for the occasion. The Rev. Dr. John MacLeod preached the early Gaelic sermon, and the Very Rev. Dr. Macgregor preached the English one—taking for his text, *Exodus*,—“Put off thy shoes from off thy feet, for the place whereon thou standest is holy ground.” The Communion service was the first Presbyterian Communion that ever took place in that building. Dr. Macgregor’s sermon (an abstract of it I have read, but too long to give) seems to have been an eloquent and appropriate one. One sentence, however, it being so suitable to our present times here, I wish to quote:—“The Columban doctrine and faith went straight to the pure fountain, the word of God. The Columban system was neither Presbyterian, Episcopalian, nor Roman Catholic. Columba, as superior at Iona, was neither Presbyterian nor Elder. Columba was beloved of all, and was one of the very greatest of men—a born leader of souls, a leader of men.”⁹⁸⁸

But I must close; for, though doubly interesting as these subjects are, and ever will be, to me, (who experienced much that is similar on my coming 63 years ago as Missionary to this dark and savage people), I must not think of occupying too much of your space, neither wearying some of your readers. In conclusion, however—this year being the great year of the “Diamond

988 WC: See *Appendix* for more.

Jubilee" —let me call the attention of your readers to these additional great facts; also, by a curious coincidence, their dates (already referred to by me, in passing) happening in this very same month of June, their returning centennial celebration lately held at Home in Britain:—(1) That of St. Columba; and (2) the conversion and baptism of King Ethelbert,—when Divine services were held in the same place (if not in the same ancient structure) in which King Ethelbert was baptised, with many of his people. There on the chalk downs overlooking the valley of the Stour close by Canterbury stands that little church, which has borne the [56] name of "St. Martin of Tours" for thirteen centuries. In that church Queen Bertha worshipped, and there Augustine and his band of missionaries began their labours, and (according to the Catholic historian, Bede,) "this building, which had been assigned by the King for the use of Bertha, had been a church prior to the Saxon invasion." Dean Stanley has well said, that the view from the slope on which it stands is "one of the most inspiriting that can be found in all the world."

I am, &c.,

WILLIAM COLENZO.

Napier, August 23rd, 1894.



LETTER II.

Fratres, nolite pueri effici sensibus."— "Brethren do not become children in sense."

— *1 Cor. xiv. 20.*

SIR,—A fortnight ago you published my letter in your paper, in which I (and others) wished to know what was "the erroneous doctrine" preached by Dr. Clifford here in Napier during his one Sunday here; this heavy assertion having been publicly advertised in our Napier papers by Father Grogan, who also said he would preach against it, There were also other reasons which had weight with me:—(1) The position of Dr. Clifford (as I then briefly mentioned); (2) His being a stranger here—one of the desired "tourists," of whom so very much has lately been said; (3) His heavy loss of all his baggage and valuables in the "Tasmania," just outside Hawke's Bay and at that same time. On such occasions, some zealous priests of the Church of Rome might possibly think strange things of an interloping preaching heretic; which serves to remind me of the forcible language of one of our celebrated British poets,—himself, too, a Catholic:—

"The good must merit God's peculiar care:
But who but God can tell us who they are?
One thinks on Calvin Heaven's own spirit fell,
Another deems him instrument of hell:
If Calvin feel heaven's blessing or its rod,
This cries there is, and that, there is no God." —
POPE.

—And in my letter seeking information, and not wishing to cause any angry feelings in Father Grogan's bosom, I said, I should avoid touching on the errors of the Church of Rome.

Father Grogan, in his long and discursive letter of reply to mine, has said a good deal about many things ancient and modern, but has shrewdly avoided all reference to the main matter—the one thing sought for, viz., “The erroneous doctrine of Dr. Clifford.” It is true, at the close Father Grogan says, (though not with reference to this), “I shall refer to it again,” and “I shall attend to it later on,” therefore I have waited till now, more than [58] a week, and seen nothing more from him. I again ask Father Grogan, “What was the erroneous teaching of Dr. Clifford?”

And now for a few observations on some of the subjects in Father Grogan's letter. Passing by all his (usual) depreciating remarks on my letter, I would note that in my heading my former letter with that glorious text, “*The truth shall make you free,*”⁹⁸⁹ Father Grogan says of it, “If I had added thereto that other significant text, ‘What is truth?’ I would have been more scrupulous in the composition of my letter, and make it less liable to deceive the general public.” This from *him!* seems so peculiar, so much in keeping, seeing the text he has

989 WC: Perhaps I had better give in a note the whole of that great saying of our Lord—So deep, so full of meaning so suited to these our times:—“Then Jesus said to those who believed him: If you continue in my word you shall be my disciples indeed, and you shall know the truth and the truth shall make you free.” *John viii. 31, 32.*

chosen was spoken by a Roman and not a Christian, and *prima facie* and as spoken has nothing to do with the short text I had chosen as a motto. But I will give the true addition, spoken also by the same holy Lord—"Thy word is Truth." (*John xvii. 17.*) And note this, my Roman Catholic friends:— "It was told Jesus, Thy mother and Thy brethren stand without, desiring to see Thee. Who answering said to them, My mother and My brethren are they who hear the word of God and do it.' (*St. Luke viii. 20.*)

Then we are told of the wonderful increase of the Church of Rome in our own days, especially in England. I own it; in outward show! but I do not see anything so very wonderful in it. Is not such also the case with some scores or more of sects and parties, all, also, more or less loudly professing the Christian name? Have we not plenty of proof all around us here, in this very small town of Napier and its adjacent country districts? Adventists, Mormons, Christadelphians, Theosophists, Plymouth-Brethren, Salvation-Army-Strollers, Hau-hau and other Maori sects and prophets? All, alike modern. And also, *abroad*; of the wonderful increase of Mahomedan and other old religions, as shown in the late great jubilee rejoicings, the Lord Mayor of London himself being a Jew! Does not much of that increase arise from the mere name—the glamour of antiquity? Just as in the case of this recent war between the Greeks and the Turks, how many have been carried away from sound reasoning by the simple fascination of the name of Greece! And, lastly, has not the great alteration in our old Conservative laws had a very great deal to do in [59] bringing this about? All, however, silently but surely testifying to the truth of

that grand saying of Jesus, too often lost sight of in the bustle and fashion of every day life—"Wide is the gate and broad is the way that leadeth to destruction, and many there are who go in thereat." (*Matt. vii. 13.*) Easy religions! Full of novelties pleasing to the senses, suitable to the day, just like bicycles. When I was a young man I thought there was much of truth in that line of Dr. Young's—"Men may live fools, but fools they cannot die." But many years ago I was led to alter my opinion and believe (as I do now), that fools may also die. The poet speaks truly when he says:—

"Hear the just law, the judgment of the skies,
He who hates *Truth* shall be the dupe of lies;
And he who will be cheated to the last,
Delusion strong as hell shall bind him fast."

Father Grogan concedes all I have said about "Christians and churches and bishops being in Britain before the arrival there of Augustine"; but he adds thereto, and brings forward the story of Lucius, King of the Britons (A.D. 156) sending to Eleutherius, Bishop of Rome, a letter that, "by his command he might be made a Christian." [For the present I pass by the correctness of this: I knew this being erroneously taught in the Roman Catholic schools in this town 30 years ago when I was Inspector, from "the Modern Geography" by the Christian Brothers (hence my remark in my former letter). An admirable school book *in other respects*, one of the best of the kind I have ever known.) We have not a copy of that letter, but we have of the answer (said to have been) sent to him by the Bishop of Rome, from which I make this extract, "Ye have received of late,

through God's mercy in the Kingdom of Britain, the law and faith of Christ; ye have with you, within the realm, both parts of the Scriptures; out of them by God's grace, with the Council of the realm take ye a law, and by that law, through God's sufferance, rule your Kingdom of Britain; for you be God's vicar in your kingdom," &c., &c. But I can cap that story of King Lucius with others quite as good from Romaist writers; a sample I briefly adduce:— "St. Peter preached in Britain, Gildas says so; Simon Metaphrastes saith so,—that he stayed some days in Britain, where having preached the word, established churches, ordained bishops, priests, and deacons, in the 12th year of Nero he returned to Rome. St. Peter himself in a vision, in the days of Edward the Confessor, reported [60] that he had preached in Britain." Father Parsons the Jesuit ("Conversioner" he was called,) states all that, and more, to show therefrom the authority of Rome in England. Simon the Canaanite is said, by Dorotheus, Bishop of Tyre under Diocletian and Constantine the Great, to have been martyred and buried in Britain. Aristobulus, counted one of the 70 disciples, is said by Grecian writers to have been made Bishop of Britain. Claudia and Pudens, living at Rome, both Christians, as stated by St. Paul himself, (*2 Tim.* iv. 21,) were said to have introduced Christianity into Britain. Here, note, that Claudia was a Briton born; Martial affirms it in his Epigram,⁹⁹⁰ and that this Claudia was wife to Pudens, the

990 WC: "Claudia cœruleis cum sit Ruffina Britannis
Edita, cur Latiae pectora plebis habet?"
—*Epig.*, lib. xi. *Epig.* 54.

same poet asserts.⁹⁹¹ But Father Parsons will not admit of all this, because not direct through the Roman Church, and interfering with Lucius; though others as Catholic as he, do entertain it and are zealous of it.⁹⁹² Lastly, Joseph of Arimathea, with his companions, are said to have come to Britain and preached the faith there, in the days of Arviragus the king, erecting a small church in Glastonbury, where he lived 12 years and was buried there. And to bolster up this story, the early budding of the Glastonbury thorn on Christmas Day has been made much of. And here I may briefly note the cunning of the Jesuit Father Parsons—unwilling to confess or unable to deny so apparent a truth, as that the first preachers of the Gospel in Britain did not so much as see Rome, he flies, at last, to this slight and slender shift,— “That albeit St. Joseph came not immediately from Rome yet he taught in Britain the Roman faith, whereof St. Paul hath written to the Romans themselves ‘that your faith is spoken of through the whole world,’” (*Rom. i. 8.*)⁹⁹³ Hereby the Jesuit hopes still to keep on foot the engagement of Britain to Rome for her first conversion!

Now, having all this, and more of a similar kind before him, was not our old learned Church historian Dr. Fuller, prebendary of Sarum = Salisbury, (*temp. Charles I.*) right, when he concluded, on patiently collecting and reviewing the whole.— “We see little [61] certainty can

991 WC: “Claudia, Rufe, meo nubit peregrina Pudenti,
Macte esto tædis, O Hymennæ, tuis.”

—l.c., lib. iv. *Epig.* 13.

992 WC: PITZEUS *de Script. Brit.* p.72.

993 WC: “*Three Conversions,*” part i., chap. i., num. 26.

be extracted who first brought the gospel hither; it is so long since, the British Church hath forgotten her own infancy. Indeed, it matters not, if the doctrine be the same, whether the Apostles preached it by themselves, or by their successors. We see the light of the Word shined here, but not who kindled it.” This conclusion of his I had also stated in my former letter.

Father Grogan goes on to say, “there are other proofs; Bede tells us, of ‘the sacrifice of the Mass,’ ‘prayers for the dead,’ ‘devotions to the Mother of God,’ &c. &c.,—‘are these not Catholic practices?’” These are (I regret to say) “Catholic practices” of to-day; but does Father Grogan suppose that such as they are now they were then at that early age taught and practised? Why, they were unknown as matters of faith; proved by the annals of the Roman (not Ecumenical) Councils themselves, which show when they were severally first received as such:—eg., the Mass at the Council of Lateran, A.D. 1216; the Seven Sacraments—first heard of as such in the 12th century; and all confirmed and established at the Council of Trent, A.D. 1545-1563, at which time were also added other new articles of faith (the Creed known as that of Pope Pius IV.), against the ancient and universally received Creeds of the true Catholic Church; besides the still newer modern errors of Rome, made in my day for the first time articles of faith—“the Infallibility of the Pope” and the “Immaculate Conception,” which additions and new Creeds all Roman Catholic priests are sworn to maintain and obey.

Moreover, Father Grogan says “that the difference between Augustine and the British Bishops were only

ritualistic and disciplinary, not doctrinal or essential,” and takes me to task for not having observed this. But let us hear what his Catholic historian, Bede, says on this very subject. “They” (British Bishops) “answered they would do none of those things nor receive him as their archbishop. To whom the man of God, Augustine, is said in a threatening manner to have foretold, that in case they would not join in unity with their brethren, they should be warred upon by their enemies; and if they would not preach the way of life to the English nation, they should at their hands undergo the vengeance of death. All which, through the dispensation of the Divine judgment, fell out exactly as he had predicted. For afterwards the warlike king of the English, Ethelfrid, having raised a mighty army, made a great slaughter of that perfidious nation” [62] —the British! . . . “Being about to give battle, he observed their priests, who were come together to offer up their prayers to God for their soldiers, standing apart in a place of more safety, he inquired: ‘Who they were?’ or ‘What they came together to do in that place?’ Most of them were from the monastery of Bangor.... Many of these, having observed a fast of three days, resorted among others to pray at the aforesaid battle, having one Brocmail appointed for their protector, to defend them whilst they were intent upon their prayers, against the swords of the barbarians. King Ethelfrid being informed of the occasion of their coming, said: ‘If then they cry to their God against us, in truth, though they do not bear arms, yet they fight against us, because they oppose us by their prayers.’ He therefore commanded them to be attacked first, and then destroyed the rest of the impious army, not without considerable loss of his own forces.

About twelve hundred of those that came to pray are said to have been killed, and only fifty to have escaped by flight. Brocmail turning his back with his men, at the first approach of the enemy, left those whom he ought to have defended, unarmed and exposed to the swords of the enemies. Thus was fulfilled the prediction of the holy Bishop Augustine, though he himself had been long before taken up into the heavenly kingdom; that those perfidious men should feel the vengeance of temporal death also, because they had despised the offer of eternal salvation." So neither Bede nor Augustine seems to have considered their differences non-essential. (Augustine died A.D. 604; and this battle was fought about A.D. 60.)

And here it should be noted and remembered, as it often appears cropping up in Bede's work, what Father Grogan has himself termed "race hatred"; Bede himself being a Saxon; and, also, that Bede lived and wrote more than 100 years after the time of Augustine, dying A.D. 735.⁹⁹⁴

Here I must close. Before, however, I do so I would just offer a word of counsel to my reverend antagonist. (First, calling to his remembrance an Irish proverb, which, in concluding my former letters in 1894, written on the assumption of Archbishop Redwood here in Napier, I then brought forward, hoping he would profit by it, viz., "*Look at the river before you cross the ferry.*") And my closing word of counsel on this occasion is,— "Si autem [63] fortior eo superveniens vicerit eum universa arma

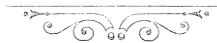
994 WC: See Appendix for more.

eius auferet, in quibus confidebat, et spolia ejus distribuet.”⁹⁹⁵

I am, &c.,

WILLIAM COLENSO.

Napier, September 6th, 1897.



LETTER III.

“The truth shall make you free.”—*Jesus Christ.*

SIR,—A letter, a very long one from Father Grogan, said to be in reply to mine of the 8th inst., appeared in your paper of the 5th. I have read it carefully and note two things. (1) It is no reply to mine. (2) It is very discursive, going in all directions, as if intended to draw away the attention of its readers from three main subjects originally at issue, viz.:—

1. What was “the erroneous doctrine” preached here by Dr. Clifford, as asserted in public advertisement by Father Grogan ?
2. That the Church of Christ was established in Britain before the advent of Augustine, A.D. 597.

995 WC: “If a stronger than he come upon him and overcome him; he will take away all his armour wherein he trusted, and will distribute his spoils.”—*St. Luke xi. 22.*

3. That that early British Church was free from the latter errors and corruptions of the Faith by the Church of Rome.

At the same time I said, I should for the present not animadvert on anything doctrinal; having already pretty fully written on the same in your paper about three years ago; and not wishing to arouse Father Grogan's warm Irish Roman-Catholic susceptibilities.

Father Grogan dexterously evaded the *first*, and now terms my request a "rather peremptory demand": concluding by asking, "What consideration had I alone of some 9000 odd people to ask for such a thing?" Perhaps Father Grogan is right, here; for who am I? A voice crying in the wilderness? or, as Michaeas against the 400 priests of the Court of King Ahab? (*Kings*, chap. xxii.) I gave, however, my reasons for intruding in my last letter, which seemed to be fair and honest. The *second* he could not deny. The *third* he has strenuously sought to combat; though if he had known ecclesiastical history sufficiently (I mean, from its original truthful sources, and not merely from modern Roman Catholic extracts, as taught in their colleges and schools) he would not have done so.

It is almost marvellous, throughout the whole of Father Grogan's long letter, how steadily he keeps this one thing in view [65] —the blinding the eyes of his readers, especially of his own people (Roman Catholics) to the truth of historical facts! a plausible sophistical letter. And while I make this heavy charge against Father Grogan, I will also add, that it is quite possible he believes all he has said to be true; this of course follows from his exclusive Roman Catholic training—from his oath to

uphold the Roman Church and Creed in all its teachings without questioning, without hearing the other side, and so *placing authority before truth!*

Here I am strongly reminded of two things; the one, solemn and divine, the parting advice (dying words I might properly call them) of the Apostle St. Paul—“I beseech you, brethren, to mark them who make dissensions and offences contrary to the doctrine which you have learnt, and to avoid them. For they that are such serve not Christ our Lord, but their own belly; and by pleasing speeches and good words, seduce the hearts of the innocent.” (*Rom.* xvi. 17, 18.) The other, (now laughable though once firmly believed,) the traveller’s story of the apes and lions in Barbary; how the apes overcome the lions by flinging fine sand into their eyes on their coming on to attack them! This, too, is illustrated with a curious quaint copper-plate engraving in an old folio volume of travels that I have.

Now I had adduced the strong and plain statement of Christ, concerning his mother and her family, as shown in an especial degree what our Lord meant in the words of my text-motto, in these words:—“It was told Jesus, thy mother and thy brethren stand without desiring to see Thee. Who answering said to them, my mother and my brethren are *they who hear the word of God and do it.*” (*St. Luke* vii. 20.) Father Grogan on this says:—“Mr. Colenso’s reference to Christ and His mother and His brethren, has no application in the present question, and so need give no trouble.” No application, eh? What did He also say in that gospel whence my motto was taken? In His divine prayer to His Father in Heaven—“Sanctify

them in truth. *Thy word is truth.*" Of course we (Protestants) can understand Father Grogan quickly shutting the box, lest the gross and vain idolatry as taught and practised by the Church of Rome and Father Grogan—of praying to the mother of Jesus as Mediator—should be even for a single moment questioned. But the word of God stands firm and true—"There is One God and One Mediator of God and men, the man Christ Jesus." (*Tim.* ii. 5.) Yes, my Roman Catholic friends, *One only*; He [67] who is "the Way, the Truth, and the Life," (*John* xiv. 6,) and *not* Mary, however holy, nor any other of the Saints. And that you, too, might see, that exactly as our Lord was when on earth, so He is now in glory, and so He will be to us hereafter. He says, "He that despiseth me, and receiveth not my words, hath one that judgeth him; the *word* that I have spoken the same shall judge him in the last day." (*John* xii. 48.)

Father Grogan says, "We are told by authorities like Bishop Tait (Anglican) and Cardinal Manning, that there are, and have been of late, men acting as Christ's ministers who do not believe in the Resurrection of Christ from the dead." Possibly so; but I believe there are many priests of the Church of Rome who do not believe in the Scriptures at all! Has Father Grogan not read of the number of Roman Catholic bishops and priests who in a body abandoned their Church at the time of the great French Revolution?—its Centenary soon to be celebrated with great public rejoicings. But all this defection—this disbelief and unbelief does not date "from the memorable year 1534," (Henry VIII.,) as Father Grogan asserts; but from the earlier ever-progressive and increasing

departure by the Church of Rome from the pure and simple Christian Faith—the truth as taught by Jesus and his Apostles.

Father Grogan says, “In 1895, 3000 clergymen, with many of the nobility and gentry, with the other lesser members of the Church Union, applied through their chairman (Lord Halifax) to the Pope of Rome for readmittance into the one fold under the one head and shepherd.” But I ask, “If true, why were they not received?” I, however, have not heard of that, as stated by Father Grogan; but that Lord Halifax himself did make some kind of private (single) application to the Pope; for which he was deservedly severely taken to task by the members of his society (E.C.U.) on his return to London. Methinks Father Grogan, well and truly knowing that the Lambeth Conference of Bishops of the Church of England, just 300 in number, gathered together from all parts of the globe, has only just been concluded, should have thought twice, at least, ere he ventured to suppose that the Church of England was decreasing, or inclined to move Romeward! Such can never be, until, at least, Rome repents and abjures her many and grievous errors respecting the Christian Faith. [67]

And here I can give the Archbishop of Canterbury’s own letter respecting Lord Halifax and his imprudent movement.

“Lambeth Palace, March 28th, 1895.

“Dear Mr. Webb-Peploe,—I have given full consideration to your letter and its important enclosure. I feel, however, I should be setting a precedent fraught with much difficulty hereafter, were I to put forth

Official utterances with respect to the speeches of clergy or laity to members of the private societies to which they may belong. I did not gather that the speech in question was to be regarded in any other light than as the expression of the individual opinions of the speaker; and, indeed, if I am not misinformed, it has already been made clear in the newspapers that he did not express the sentiments of the society generally. But while I must abstain from the task of commenting upon the speeches thus delivered (a task which might indeed be endless), I have no hesitation in saying that, in my opinion—to quote your own words—‘Any co-operate union with Rome so long as she retains her distinctive and erroneous doctrines, and advances her present unprimitive and unscriptural claims, is absolutely visionary and impossible.’—Believe me, sincerely yours,

(Signed) ED. CANTUAR.”

“The Rev. Prebendary Webb-Peploe,
Chairman of the National Protestant Union.”

Father Grogan says “Henry VIII. proclaimed himself the Pope and spiritual head of the Church of England.”

Another glaring error! Henry did nothing of the kind. At that time of Henry’s dispute with the Pope, the clergy and people of England groaning under papal intolerance, threw their influence on the King’s side, and eventually the King proposed that the clergy should acknowledge him to be “the protector and only supreme head of the Church and clergy of England next to Christ.” This was agreed to in the Convocation of Canterbury in 1531, with the following clause, “as far as is allowed by the law of Christ,” which was afterwards embodied in the Act called “The Submission of the Clergy.” Later on the “Act of

Supremacy" and the "Statute of Appeals" were passed—utterly abolishing every vestige of Roman supremacy and jurisdiction—always previously illegal and unconstitutional—and thus the old constitutional position of the King was restored, and freedom obtained for the Church to enter on her own work of reformation. The Pope's usurped authority [68] was then declared to be at an end, and Henry claimed to be the supreme head of the Church. The Act which gave the title "Supreme Head" was repealed in Mary's time, and not revived by Queen Elizabeth. The King's supremacy is a point which is often misunderstood and purposely made very much of, but it means practically very little. This claim was not a new one in any sense; it was simply the restoration to the Crown of the supremacy which once belonged to it before the Popes usurped the right. Both Coke and Blackstone assert, that power was restored to the King which had been conferred on former monarchs, but then in abeyance.⁹⁹⁶ The action of declaring it by Henry VIII. was the practical restoration of a principle as old as the monarchy and constitution, and dating back to Anglo-Saxon times; the Act of Henry VIII., c. 21., declares it to be an ancient constitutional principle; Canons I. and II. of the Church of England affirm it; and such is also, in *Article XXXVII*, in the Common Prayer-book of the Church of England. Jesus Christ is the *Spiritual Head* of the Church of England.

Again: If, as Father Grogan says, quoting Bede, "King Lucius was made a Christian by Pope Eleutherius (A.D. 156)," what need to make several others—more or less

996 WC: See *Appendix* for an early instance.

doubtful—who preceded him the introducers of Christianity into Britain, but only as from Rome? One thing alone in Bede concerning the ancient British Church is pretty clear and certain, that of Augustine finding an established Christian Church there, with her bishops and her large and flourishing schools of learning (as quoted by me in my first letter), but, as Bede states, under different ecclesiastical customs—as, the time of keeping Easter, the tonsure, (shaving the crown of the head,) and their manner of celebrating baptism; all showing, witnessing, proving, that the ancient British Church did not receive their Faith with its rites and ceremonies from the Western Church Rome, but from the Eastern Church, which especially held to that different time or computation of keeping Easter.

Father Grogan has also said in his first letter that “those differences between Augustine and the British Bishops were only ritual and disciplinary, not doctrinal or essential.” But, again, on the contrary, I showed, that neither Augustine nor Bede had considered them to be such—as clearly shown in Bede’s account [69] of the dreadful slaughter of some thousands of those poor unfortunate and unarmed Christian monks by “barbarians (pagans)” shortly afterwards; which, Bede says, was predicted by holy Augustine, and inflicted by God on them for their perfidy! I note, in passing, Father Grogan—with all his sensibilities for his people of Connaught, with all his professions of love for Truth—does not care to acknowledge this: it does not suit him to do so. Indeed, in his last letter he even re-asserts his former statement and that more clearly, saying—“I conclude that the faith and doctrine of the early Britons

was just the same as that of Rome." Alas poor British Church, such at an early date was the love of the Church of Rome towards you; how truly in this respect her motto—"Semper eadem."

Father Grogan tries hard, in many words, to make me accuse the "Christian Brothers" of teaching erroneous doctrine; repeatedly stating it. I did nothing of the kind; I merely stated that, 30 years ago, I knew of their having in their "Modern School Geography," this historical error of King Lucius sending to Rome to be made a Christian; moreover, I praised their school geography as being in *other respects* an admirable work: I possess a copy.

Two more remarkable statements of Father Grogan require notice: The first (he says)—"The mission of St. Peter to Britain, with Aristobulus, Joseph of Arimathea, and all the rest, this has nothing to do with the question." [If so, why did the mediæval Roman Church writers strive so earnestly to bring them forward in support of the claims of Rome?] "It matters not" (he says) "how or when they came to Britain provided they came from Peter, because, as St. Ambrose says, '*Ubi est Petrus ibi est ecclesia.*' Peter held the citadel, the head and centre of all ecclesiastical power and jurisdiction." This quotation from St. Ambrose is, to me, astonishing—indeed, without its context, it appears strained, perverted, (much like two other small quotations are by Father Grogan; the one, mine, from Dr. Young; the other, his own, Melancthon's to his mother.) After, too, the direct quotations from St. Ambrose's works *to the very contrary*, I had given in your paper, when writing on this

subject three years ago,⁹⁹⁷ which I now repeat, together with those from St. Augustine. These two great men were indeed early Fathers of the Church, living before Rome had so grievously gone astray from the Truth (Ambrose [70] A.D. 374, and Augustine A.D. 398). Thus St. Ambrose, “that not Peter, but the faith of Peter was the foundation of the Church.”⁹⁹⁸ So St. Augustine says that our Lord meant “On this Rock which thou hast confessed will I build my Church.”⁹⁹⁹ To the same effect writes Chrysostom,¹⁰⁰⁰ Hilary, Cyril of Alexandria, Basil of Seleucia, Theodoret, Isidore, Theophylact, and others. The second respects the supremacy, &c., of the pope of Rome over the whole Universal Church. I could give a vast amount from undisputed ancient Catholic authorities on this head, but shall content myself with that of Pope Gregory the Great, who sent Augustine to England—who so vehemently protested against John Nesteuta, the

997 WC: See page 15.

998 WC: "Fides ergo est ecclesiæ fundamentum. Non enim de carni Petri, sed de fide dictum est, quia portæ mortis ei non prævalebunt sed confessio vincit infernum."—*De Incarnat. Domin. Sacrament.* c. 5.

999 WC: "Super hanc Petram, quam confessus es, ædificabo ecclesiam meam."—August in *Johan.*, tr. 124, tom. iii., par. ii., p. 822. And, in his *Retractations*, he tells us. that he had formerly interpreted the passage of St. Peter, but that he afterwards thought it more correct to understand it of Him, whom St. Peter confessed. "Non enim dictum est illi, Tu es Petra sed Tu es Petrus. Petra enim est Christus, quem confessus Simon, sicut tota ecclesia confitetur dictus est Petrus"—*Retractat.* i. 21, tom. i. p. 32.

1000 WC: "St. Chrysostom interprets 'On this Rock,' by 'On the faith of this confession.' *Epi tauite tee petra . . . toutesti epi tee pistei tees homologias.*"—*Hom. LVI in Malt. XVI.*

bishop of Constantinople, for desiring to have the name of Universal Bishop, that he pronounced such an assumption a proof that he who made it was the *forerunner of Antichrist*. "None," says the Pope, "of my predecessors ever consented to use so profane a word; because if one patriarch is called universal the name of patriarch is taken away from the rest."¹⁰⁰¹ The Canons, too, of the earlier General Councils were to the same effect, viz., of Constantinople (A.D. 381) and of Ephesus (A.D. 431), forbidding bishops to go beyond their dioceses or to invade another province.

Berengarius (adduced by Father Grogan) Archdeacon of Angers, a man eminent for piety, was forced to recant (A.D. 1050) the old received doctrine concerning the Lord's Supper, (which had been also taught before in the writings of Bertram, Scotus, and Aelfric, all eminent churchmen,) but not so much by his preaching against the Mass and Transubstantiation, and so showing their existence at that period, which is not denied, (as Father Grogan ingeniously puts it,) as by his standing for the ancient [71] belief of the Church. It has been well observed by some ecclesiastical historians, "that the doctrine of the Anglo-Saxon Church was more than others in accordance with the primitive truth." The famous Aelfric, who was Archbishop of York, died about A.D. 1051. Some valuable fragments of his writings remain in Latin and Anglo-Saxon full of clear statements

1001 WC: "Ego autem fidentur dico quia quisquis se universalem sacerdotem vocat, seu vocari desiderat, in elatione sua Antichristum præcurrit quia superbiendo se cæteris præponit."—Gregor. Magn. *Epist.* vii. 33, et v. 43.

on the doctrine in question. “That housel” (ie. the Eucharist) “is Christ’s Body, not bodily but ghostly; not the Body which He suffered in, but the Body of which He spake when He blessed bread and wine to housel, a night before His suffering,” &c. According to all ancient Church historians the word “transubstantiation” was *first* used A.D. 1100 said to have been invented by Stephen Bishop of Augustodonus, in his book *De Sacramento Altaris*. I suppose Father Grogan has read of the long and heavy war waged by the Church of Rome against the Bohemians respecting their right to continue to partake of the Cup at the Lord’s Supper as of old; the denial of it to the laity having of course followed from the figment of transubstantiation; in which at last, after much slaughter as usual! Infallible Rome was obliged to give way and concede it. It is a remarkable acknowledgment of Cardinal Bonar, “That always, everywhere, from the very first foundation of the Church to the 12th century, the faithful always communicated under the species both of bread and wine.”—(Bonar, *Rev. Liturg.* Lib. ii. c. 18, n. 1.)¹⁰⁰²

I must not omit to notice with pleasure that Father Grogan agrees with me in my “disapproval of the various divisions, or denominations, as they are usually called, in which” he says, “I quite agree with him that it is the realisation of the words of the Sermon on the Mount,

1002 WC: “Certum est omnes passim clericos et laicos, viros et mulieres sub utraque specie sacra mysteria antiquitus sumpsisse, cum solemini eorum celebrationi aderant, et offerebant et de oblatis participabant.... Semper enim et ubique, ab ecclesiæ primordiis usque ad sæculum duodecimum sub specie panis et vini communicarunt fideles,” &c. (Quoted by Bingham, E.A, xv. v. 1.)

'For wide is the gate and broad is the way that leadeth to destruction, and many there are who go in therat.''" Closing also his long remark with— "I don't think my friend wishes to include the Catholic religion with those he terms as easy and full of novelties like bicycles." Here, however, I must undeceive Father Grogan, and plainly yet courteously tell him, that I consider his Church of Rome to be the very worst of them all!—the oldest and first, and furthest gone, and most hardened in error; indeed to her example and practice all the [72] others may be well and logically traced. Surely Father Grogan can never have forgotten the plain language I used in the conclusion of my last public letter (December 20th, 1894) on Roman Catholic Errors? I will again use it:— "It is more than 50 years since I first gave serious attention to this subject, and I have studied it often and long and thoughtfully since, with many years of painful trials and experience, and my matured convictions strengthen me in my belief that the Church of Rome is not the Catholic Church of Christ, but rather—as our martyred forefathers declared at the stake, with a fearful fiery trial and death at hand—ANTICHRIST," and, as the Irish Church has it in her 80th article—"the Pope is that Man of Sin foretold in Scripture." Also (as the great "Diamond Jubilee" is just passed, and still in the minds of the people) I may well copy the sentence following in that same letter—"Queen Victoria, in the presence of the assembled Estates of the realm, on November 20th, 1838, took a solemn oath, of which this is part:—'I, Victoria, &c., do solemnly and sincerely, in the presence of God, testify and declare that the invocation and adoration of the Virgin Mary, or any other Saint, and the sacrifice of

the Mass, as they are now used in the Church of Rome, are superstitious and idolatrous.”” Had not the Church of Rome declared herself “Infallible,” (which untenable position Father Grogan attempts to support and defend,) I would fain hope for repentance and reformation on her part under clearer light; and that carried out, would be the means for the Church of England and all the Western National Churches, Denominations, and Sects, joining her in true unity and brotherly love; then the present “Babel discord” (as Father Grogan aptly terms it) would cease to be. And, lest Father Grogan and his fautors should say or suppose—“Tut, ‘tis only the voice of one very old man,”—I will first give a quotation from the work of one of our most celebrated modern divines and scholars—the late Henry Alford, Dean of Canterbury, the writer of many theological works, and particularly the editor of the Greek New Testament in several volumes, with a revised text and translation and learned digest. This work, I may mention, being a class-book with our English bishops in their training and examining of students for the ministry—Alford says:—

“Many signal apostasies the world and the Church have seen. Continually, those are going out from us, who were not of us. Unquestionably the greatest of these has been the Papacy, [73] that counterfeit of Christianity, with its whole system of falsehood and idolatry. But both it, and Mohammedanism and Mormonism, and the rest, are but tentamina and foreshadowings of that great final apostasy (*hee apostasia*), which shall deceive, if it were possible, even the very elect.”—*Prolegomena 2 Thess. sect. v. c.*
37.

In concluding my long letter—necessarily long owing to Father Grogan's prolix and very discursive one, requiring an answer or a remark on many of its subjects—I would say, that I do not intend to write another on this occasion to your paper, whatever Father Grogari may please to say by way of rejoinder to this. And, seeing that Father Grogan has so commonly ignored or forgotten my letters on those and kindred subjects, published by you in your papers of November and December, 1894, my present determination is, to republish them with additions in book form at your press by the end of this year (which I was asked to do at the time they were being published, but rather too late as the type had been distributed). For, thoroughly believing, as I do, in the truth of what I have therein written and brought together, I should like for the same to remain on record and handy for reference after I am gone Home; if only to show in days to come what one who had long laboured among you once thought and believed.

I am, &c.,

WILLIAM COLENSO.

Napier, September 18th, 1897.



APPENDIX

Father Grogan's first advertisement in the "Daily Telegraph," August 7th., 1897.

The subject of Father Grogan's discourse to-morrow evening in St. Patrick's will be, "The Mission of St. Augustine, Apostle of England; who sent him, and what was his doctrine? With some light thrown on the erroneous and unhistorical doctrine of the Rev. Dr. Clifford on last Sunday.*

Father Grogan's second advertisement in the "Daily Telegraph," August 14th., 1897.

The subject of Father Grogan's discourse to-morrow evening in St. Patrick's will be, "St. Augustine's Doctrine the Foundation of England's Greatness, with a little more light thrown upon the erroneous teaching of the Rev. Dr. Clifford."**

The following extract from Bede's work will also show how well and greatly Christianity was known in the more northern parts of Britain long before the arrival of Augustine in Kent, through the instrumentality of Columba, and Ninias, and others of the British nation.

"In the Year of our Lord 565, when Justin, the younger, the son of Justinian, had the government of the Roman empire, there came into Britain a famous priest and abbat, a monk by habit and life, whose name was Columba, to preach the word of God to the province of the Northern Picts, who are separated from the southern parts by steep and rugged mountains; for the Southern Picts, who dwell on this side of the mountains, had long before, as is reported, forsaken the errors of idolatry, and

embraced the truth, by the preaching of Ninias, a most reverend bishop and holy man of the British nation. . . . Columba came into Britain in the ninth year of the reign of Bridius, who was the son of Mailochon, [elsewhere called Mailcuin,] and the powerful king of the Pictish nation, and he converted that nation to the faith of Christ by his preaching and example, whereupon he also received [75] of them the island of Hii for a monastery, for it is not very large, but contains about five families according to the English computation. His successors hold the island to this day; he was also buried therein, having died at the age of 77, about thirty-two years after he came into Britain to preach. Before he passed over into Britain, he had built a noble monastery in Ireland.... The island of Hii has for its ruler an abbat, who is a priest, to whose direction all the province, and even the bishops, contrary to the usual method, are subject, according to the example of their first teacher, who was not a bishop, but a priest and monk,... this we know for certain, that he left successors renowned for their continency, their love of God, and their observance of monastic rules. It is true they followed uncertain rules in observance of the great festival, as having none to bring them the synodal decrees for the observance of Easter, by reason of their being so far away from the rest of the world, wherfore they only practised such works of piety and chastity as they could learn from the prophetical, evangelical, and apostolical writings. This manner of keeping Easter continued among them for the space of 150 years, till the year of our Lord's incarnation 715.”
(*Bede*, book III. chap. 4.)

Of King Lucius.

There has ever been grave doubts among ancient standard writers of Ecclesiastical History of the truthfulness of the story of King Lucius sending afar off in such troublous times to the bishop of Rome to be made a Christian. This also appears from the manner of Roman Catholic writers themselves, seeking to add thereto from other well-known legendary and still more strange sources; as if they were afraid of relying on it; as I have briefly shown at pages 59, 60. And this story of King Lucius, I may say, seems to be the more doubtful from Bede's own manner of mentioning it—being so very short and abrupt; so widely different from his usual mode of writing on Church matters—especially on important ones—and this (if true) the most important of all! and yet containing other historical errors in it—of Biography and Chronology, as I shall show.

First, however, I will quote Bede's own words; these being all he says— “In the year of our Lord's incarnation 156, Marcus Antoninus Verus, the fourteenth from Augustus, was made emperor, together with his brother Aurelius Commodus. In their [76] time, whilst Eleutherus, a holy man, presided over the Roman Church, Lucius, King of the Britons, sent a letter to him, entreating that by his command he might be made a Christian. He soon obtained his pious request, and the Britons preserved the faith, which they had received, uncorrupted and entire, in peace and tranquillity until the time of the Emperor Diocletian.” Ch. IV. (the whole of it.)

In this passage are several errors as to Roman (secular) history. No such emperors as the two mentioned ever reigned together, nor is the date or name of the bishop of Rome more correct than those of the emperors.

Eleutherus flourished between A.D. 176 and 192, and Marcus Antoninus was made emperor A.D. 161—

And, by old Roman Catholic writers, (nearly 30 in number,) the date of King Lucius' conversion, range from A.D. 99, P. Jovius in *Descrip. Brit.*: William of Malmesbury, A.D. 166 : Polydore Virgil, A.D. 182: Saxon Annals, A.D. 189; all, however, solely deriving their accounts from Bede, as above; moreover, at that very early period, there was no such a king known as of “the Britons.”

An eminent early instance in Ireland, of a Priest indicted on the Statute of Premunire. (Reign of Henry VI, A.D. 1450.)

One Robert Lalor, priest, a native of Ireland, to whom the Pope had given the titulary bishopric of Kilmore, and made him Vicar-General of the see apostolic within the archbishopric of Dublin, &c., boldly and securely executed his pretended jurisdiction for many years, was indicted at Dublin in Hilary term, *Quarto Jacobi*, upon this Statute of *Premunire*, made two hundred years before being the Sixteenth of Richard II. His Majesty's learned counsel did wisely forbear to proceed against him upon any later law—because recusants (swarming in that kingdom) might have their judgments convinced, that long before King Henry VIII. banished the usurpation of the Pope, the King, Lords, and Commons in England,

though for the most part of the Romish religion, made strict laws for the maintenance of the crown against any foreign invasion. Whereupon, after the party indicted had pleaded at large for himself, the jury departed from the bar, and, returning within half an hour, found the prisoner guilty of the contempt whereof he was indicted; whereupon the Solicitor-General [77] moved the Court to proceed to judgment, and Sir Dominick Sarsfield, one of the justices of His Majesty's Chief Pleas, gave judgment according to the form of the statute whereupon the indictment was found. Hence it plainly appears, that such misdemeanours of papists are punishable at this day, by virtue of those ancient statutes, without any reference to such as were enacted since the Reformation.

FULLER'S *Church History*, vol. 1., p. 513.

Of the Statute of Premunire.

As this word has been a few times used by me, and may not be clearly understood by all who may read this little book, (it being a foreign term derived from the Latin,) I should like to explain it in a few words.

In LAW, *Premunire* is the offence of introducing foreign authority into England: also, a *writ* in the common law whereby a penalty is incurable: and, also, the *penalty* itself so incurred. The great Cardinal Wolsey incurred a *premunire*, forfeited his honour, estate, and life, which he consequently ended in great calamity.

The grand old “*Statute of Premunire*” was enacted in the reign of Richard II., A.D. 1393; wholly against the inordinate grasping avariciousness of the Popes of Rome;

which was then, and long before, sucking out the very vitals of the Church and Commons of England; several Proclamations and other Acts containing the principle of this statute, had been from very early times issued by the Kings of England. I possess a copy of this famous ancient English Statute, (too long for insertion here,) it is well worth a close study as showing the determined spirit of our British forefathers against the increasing innovations of the Popes of Rome. It was commonly known by the name of the "*Maul-Popes Statute*"; it gave such a blow to the Church of Rome, that it never fully recovered itself in Britain, and gradually decayed down to the time of the Great Reformation.

The St. Columba centenary.

The thirteenth centenary celebration by the Church of Scotland, commemorative of St. Columba, took place yesterday in [77] the island of Iona, cloudless skies, bright sunshine, and an exhilarating breeze making the day all that could be desired. By the beginning of the week many of the rev. gentlemen who had promoted the centenary celebrations, together with many more who were to take part in the services, had, along with their families, arrived and taken up their quarters in the island. Tuesday's steamer brought a contingent of over thirty clerical gentlemen to the island, but by far the greater body of visitors to Iona, both clerical and lay, came over from Oban yesterday morning. A very large and representative company left the bay at 8.0 a.m. in the steamer Grenadier, of the Royal Mail route. Among the more prominent visitors to the island were Lady Victoria

Campbell, Lady Frances Balfour, Lord Balfour of Burleigh, Sir John Burns, Lady Burns, and the Misses Burns, Mr. Montague Douglas Campbell, Mr. R. Shaw Stewart, the Rev. Dr. Mitford Mitchell, the Rev. Professor Story, the Very Rev. Dr. MacGregor, the Very Rev. Dr. Muir (Moderator), the Rev. Dr. M'Adam-Muir, the Very Rev. Dr. John MacLeod, the Rev. Dr. Norman MacLeod (London), the Rev. Dr. Russell, and the Rev. Colin Campbell. In addition to these, the Church of Scotland generally was well represented, while other clerical gentlemen were also in evidence.

The services arranged for, which were four in number, were conducted in the Cathedral. The nave and aisle were artistically roofed in, while a handsome stained and draped pulpit and chancel rail were erected. The first service of the day, in Gaelic, was held at 10.45 a.m., at which there was a good attendance. The Rev. Mr. Macmillan conducted the preliminary services. The Rev. Dr. John MacLeod, Dr. Blair, and Dr. Russell also took part, the former of whom preached the sermon, in which the Rev. Doctor quoted in Gaelic, with remarkable effect, Dr. Johnson's well-known words, "that man is to be little envied whose patriotism would not rise higher on the field of Marathon, and whose piety would not wax warmer on the ruins of Iona." The singing of the Psalms was done in the old Gaelic style, each line being read before being sung, and the effect was most striking. The Rev. Mr. M'Farlane, of Morvern, led the singing.

The principal service was in English at 12 o'clock noon, when a crowded congregation attended. After the opening voluntary on the organ, an intoned prayer was

offered up; after which the 34th and 84th Psalms in the prose version were chanted, [79] the Doxology being sung at the end of each. After the 49th chapter of Isaiah had been read, a hymn was sung, and the fifth chapter of St. Luke's Gospel was read, followed by singing and prayer. The very Rev. Dr. MacGregor was the preacher, who took as his subject the words contained in the Book of Exodus, "Put off thy shoes from off thy feet, for the place whereon thou standest is holy ground." Dr. MacGregor said there was no holier spot than that on which they were gathered. It witnessed the beginning of a mighty influence, and the one light radiating from there kindled the religious light of the greater part of Britain as well as part of the Continent. Columba's biography was written some sixty years after his death, by Adamson, and on that account they could rely on what was therein given as being authentic. Proceeding to deal with the great event in Scotland's religious history—the coming of Columba to the shores—he briefly indicated the condition prior to Columba's coming, taking and giving a short résumé of the life of Columba to his fortieth year, when he crossed to Scotland. Dr. MacGregor remarked that the training Columba had could have been got nowhere else. In the earlier part of the history of Columba he had exemplified the truth of the saying that the child is father of the man, but the outstanding point in Columba's life was his coming to Iona. The derivation of the name gave the meaning as "matchless beauty." Speaking of the literary compositions of Columba as gems of English literature, the preacher referred to his building the monastery at Iona, and described the building and the mode of living. Dealing with the Columban

doctrine and faith, he held that it was that of Jerome and Augustin. For their tenets they went straight to the pure fountain of the Word of God. The Columban system was neither Presbyterian, Episcopalian, nor Roman Catholic. Columba, as Superior at Iona, was neither a Presbyter nor an Elder. The preacher pictured Columba and his followers as having neither purse nor scrip. Columba was beloved of all, and was one of the very greatest of men. One fact stood out prominently. He was a born leader of souls, a leader of men. The preacher then went over in details the incidents of the last days of Columba, and the closing scene of his death. Touching upon the outcome of Columba's labours, the preacher dwelt with enthusiasm on the influence of those labours in moulding Scotland and the Scottish character, and also in influencing England. Dr. MacGregor claimed a very high place for the Saint—a place, perhaps, above [80] any Roman Catholic Missioner. In conclusion, he pointed to the coming Jubilee, and was inclined to class among the great outcomes of Columba's work all civilising and religious work.

The Rev. Dr. McAdam Muir, the Rev. Professor Story (Glasgow), the Rev. Dr. Russell, and others took part in the service. The hymns were largely part singing, were conducted by a special choir from Govan, and most effective. No more ornate service could have taken place under the same auspices. The Communion service was the first Presbyterian Communion that ever took place in the building, and by the first Presbyterian minister ever ordained on the soil. A Gaelic service at 3.30, and an English service at 7.0 p.m., were also conducted.

Among the various anniversaries which happen to fall within the present year, the thirteenth centenary of the death of St. Columba, celebrated at Iona Cathedral yesterday, is not the least interesting. The commemoration was conducted under the auspices of the Church Service Society—as the “High Church” Party in the Kirk are called—and will be kept over again by the Roman Catholics on Tuesday. The 9th of June, 597 A.D., was the day on which Columba died, so that the Presbyterians have the advantage of the Catholics in the exact date; yet, as Dr M’Leod remarked in his sermon yesterday, the Columban system was neither Presbyterian, Episcopalian, nor Roman Catholic. The Duke of Argyll is the proprietor of the Island, and it was he who gave permission to the Roman Catholics to perform their ceremony, but on condition that the Establishment had priority in the celebration. The Anglican Communion in Scotland is probably a better representative of St. Columba than either, but its members do not seem to have bestirred themselves in the matter. Lord Balfour of Burleigh, the Secretary of State for Scotland, was present yesterday. A good deal of interest has recently been reawakened in St. Columba, owing to the controversy that has arisen in regard to St. Augustine, and the curious coincidence that the one died less than two months after¹⁰⁰³ the other first set foot in Britain. But however their rival claims may be adjusted, it is certain that Columba was the founder of the Church in Scotland and in the North of England, and the number

1003 WC: I take this word “after” to be an error—it should be before: as Columba died in June (6th. or 9th.) and Augustine landed in August.

of Churches and monasteries which he built in Ireland entitle him to be considered a kind of second [81] founder. Two great men have visited Iona in modern times, and have left descriptions of it to which all persons interested in the subject may be referred—Dr. Johnson and Sir Walter Scott. But they do not throw much light on its ecclesiastical history. Scott introduces “Iona’s holy fane” into “The Lord of the Isles” for the purpose of contrasting it with the celebrated cave at Staffa, which forms a kind of natural cathedral, seeming to put to shame the work of any earthly architect, however excellent in its way; and he says the same thing again in a letter to his friend Morritt. The two, Staffa and Iona, stand over against each other, and naturally suggested the contrast.¹⁰⁰⁴ Iona was the burying-place of the ancient Scottish Kings, Shakespeare’s Macbeth being the last who was interred here. The ground was reserved for people of high degree, and the number of stones commemorating them is something prodigious. But most of these are defaced, or sunk so low in the earth, that, from one cause or another, any inscriptions which they may have borne have now disappeared. The Island itself, however, seems to have changed but little since the days of Columba. Sheep have been introduced, and there may be more grass and less heather. But little else has been

1004 WC: “Nor doth its entrance front in vain
To old Iona’s holy fane,
That Nature’s voice might seem to say,
‘Well hast thou done, frail Child of clay!’
Thy humble powers that stately shrine
Tasked high and hard—but witness mine.”

—*Lord of the Isles*: Canto IV.

altered since the day of its celebrity, when it was still the spot ‘where secret piety reposed, and fallen greatness was deposited.’ A hundred years ago the traveller dined on a cluster of rocks, and slept in a farmer’s barn. But nowadays better accommodation has been provided; an inn has been built, and we can almost anticipate the day when the [restless mercurial] tourist will carve his name on the sepulchres of ancient Kings, and the ruined tombs of Saints to whom he is indebted for his own religion. *It is some comfort to think that we cannot have a railway to Iona.* “STANDARD” June 10, 1897.

The ancient name of Iona, was I, or Hi, or Aoi, which was Latinized into Hyona, or Iona. The common name of it now is I-colum-kill,—the Island of Colum of the cells. It is one of the most fertile and most romantic of the Scottish islands, separated from the west point of Ross by a narrow channel called the Sound of I; and is about three miles long, and nearly a mile in width. [82]

The Bishops at Glastonbury.

At the invitation of the Bishop of Bath and Wells, the representative Bishops of the Church of England, who lately assembled at Lambeth, visited Glastonbury yesterday. The Bishops arrived by special train from Waterloo, and were received and entertained at the Assembly Room by the Mayor. Their Lordships afterwards robed, and, accompanied by about a thousand clergy, marched in procession to the Abbey ruins, in the choir of which a short service was held.

The Bishop of Stepney delivered an historical address. He spoke of the legend of the foundation of Glastonbury by Joseph of Arimathea, and expressed his instinctive belief that in prehistoric times there was a sacred tree at Avalon.¹⁰⁰⁵ He said he regarded the story of Lucius and the Bishop of Rome as an invention of four hundred years later. He pointed out the successive stages in the conquest of Wessex by the English. The West Saxon King had been baptised seventeen years before the Battle of Bradford-on-Avon (652), which opened the region of Glastonbury to the English armies, so that the sacred spot was taken possession of by Christian English, and worship there was not broken off. Whatever else was merely legendary about Glastonbury this was not—that the earliest oratory or church there was built of wattlework,¹⁰⁰⁶ and that this *vetusta ecclesia* was for

1005 WC: Old chroniclers point out Avalon or Glastonbury as the spot where the first Christian rites were performed by Joseph of Arimathea and his 12 companions who planted Joseph's staff in the ground, which grew into the Holy Thorn. This legend, like many others of early days, is one of interest—especially in its entirety, wherein their journey and voyage from Jerusalem is given; which stories (like these still more romantic ones of the Maoris of their immigration hither to New Zealand) serve to show how easily humanity may be deceived! But this legend of Joseph was unknown until Norman times.

1006 WC: As was also the case in this country everywhere on the reception of Christianity by the Maoris. Here in the Hawke's Bay District "the earliest oratory or church was built of wattle-work," (or reeds and rushes compactly and neatly bound together between worked timber posts,) and stood at the then Maori village of Waipukurau. This building—the first inland Christian church—was the talk and admiration of all, its fame went far and near; Maoris coming from a distance—as lower Manawatu, Wairarapa,

many centuries preserved. Gildas and the younger Patrick were buried in it. To the east of it a British saint built a little church of stone, dedicated to the Virgin Mary. Later still, but still before the Saxon time, some visitors from North Britain built a third church to the east of the [83] other two. Then Aldhelm, the Saxon Abbot of Malmesbury, and afterwards for four years (705-709) first Bishop of Sherborne, advised Ina, King of Wessex, to build a considerable basilica of stone to the east of the other three, and he dedicated it to St. Peter and St. Paul about the year 680. The four churches were all enclosed within one wall. After repeated rebuildings, consequent upon fires, about the year 1350 the mighty temple was completed among whose ruins they were gathered. The dedication of a church there to St. Peter and St Paul, by Ina, bore in an important manner upon a document issued four years ago, signed by all the Bishops of the Roman Communion in England, with Cardinal Vaughan at their head.

The document claimed that England was dedicated in the earliest times of the English Church to St. Peter. In support of this they declared that "the second monastery at Canterbury was dedicated to St. Peter himself." Unfortunately for them, it was not true; it was dedicated to St. Peter and St. Paul, and the emphatic "himself" was a serious aggravation of the error of the statement. In fact, when Ina built a large church there, he dedicated it

Taupo, Mohaka, and Wairoa (on foot and barefooted, and without made roads!) to see it; and in it, for a considerable time in the '50's, the first early settlers used to assemble on Sundays for church service.

to St. Peter and St. Paul. They should, indeed, have expected that it would be so, for early dedications to St. Peter alone were rare. He might add that, beyond all possibility of question, the earliest dedications in England to single Apostles were dedications to St. Andrew and St. Paul, not to St. Peter. At Glastonbury, if anywhere in the world, they were face to face with the terrible crisis of ages of increasing error requited in one short spasm of wrong more grievous still. From one end to another of that fair land of theirs, once the very garden of the Lord in the multitude and in the beauty and splendour of its religious houses, from one end to another were scars that told of the cutting out of a widespread, deep-rooted cancer from the national life. As they looked back upon the past and saw how internal dissensions led, now one side now another, to seek the intervention of a foreign Power in disputes that ought to have been settled at home, and how a spiritual power that would have been more than human if it had refused these aggrandisements made a very mundane use of the opportunities which now the shepherd and now the sheep offered for fleecing the flock, they felt that the day was bound to come, if the nation was to live, when the lion would rise up in the shorn lamb. They saw the wrath gathering. The statutes, and the preambles of the statutes, of provisors and *premunire*, and appeals to Rome, grew in the intensity of [84] their national force, till it came to pass that the heaven was black with clouds and wind, and the lightnings struck the very mountain of God, and Glastonbury and her compeers fell. They fell by human means. How foul the means were was one of the enhancements of their sorrow that they fell. They had this

one relief, that at least those who wrought the destruction were art and part in the errors of those whom they destroyed. They were not those who thought as we think. They were not those who, some years later, cast to the winds, to follow the usurped authority of Rome, the accretions of the dark ages, the devouring growth which had covered, in the most ignorant and unintelligent centuries, the faith once delivered to the saints. There were persons foolish enough to declare that the Church of England before the Reformation was a Roman Catholic Church. It never was. It was always the *Ecclesia Anglicana, Anglorum Ecclesia*. But if they would have it so, then it was the Roman Catholics who threw off the supremacy of the Pope in England, and it was men of Roman Catholic belief and practice who destroyed the monasteries and took the plunder. And it was the head of the Roman Catholic Church himself who guaranteed to one and another of them, as, for instance, to Sir William Petre, that they should not be disturbed in the possession of the property thus acquired. And it was a Roman Catholic Sovereign, Queen Mary, who passed the stringent act against any one being disturbed in the possession of "the sites of the late monasteries, and other religious or ecclesiastical houses or places, and all the manors, glebe lands, advowsons of monasteries, abbeys, rectories, vicarages, churches, archbishoprics, and bishoprics." When they asked, Of what faith was this King? (Henry VIII.) they found the answer in an Act of Parliament of the same year, which condemned to death all who denied transubstantiation and other characteristic Romish doctrines and practices. So far as faith was concerned, it was a Roman Catholic King who struck the

foul blow; it was a Roman Catholic Queen, in a fuller sense, who prevented the vast property from being restored to the Church. They had in the mind's eye, gathered from successive ages of Glastonbury, the Irish, the North British, the Welsh, the Angles, the Saxons, the Normans, and that blended race we call the English. Not in the mind's eye only, but in the flesh too; not in successive ages, but all here that day. The descendants, the representatives, of all the ancient Churches were [85] there. And there were present with us, profoundly welcome, those whose presence proclaimed that the Almighty looked at the heart, and under the new covenant there was no asking, "Can the Ethiopian change his skin?" Here were represented a great multitude, which no man could number of all nations and kindreds and peoples and tongues. They were met where first, in the dim and distant past, the seed of the Gospel was sown by the side of the glassy creek; some tending at home the growth of sixteen or seventeen hundred years; others sowing in far-off lands the small seed where sixteen or seventeen hundred years hence there might be a gathering such as that. They had gone deeper down than the warfare between the English and the Britons; they had drunk inspiration from the source of Irish, and Scottish, and Welsh, and English alike. They went forth to their various tasks, drawn together in a way that he could not have conceived of a month ago. As the news passed through the Christian world that this man or the other has done such and such a thing, they would know what he looked like wherever he might be; they had heard the ring of his voice; they knew the very turn of his phrase; they had pressed his hand. He would counsel all to keep

their printed list of Bishop's names, and read them from time to time as the diptychs were read of old. From that great eighth century, with its fervour of work at home, its passion for the missionfield, there came the lesson that they would do well never to forget that in the spiritual world it was not land and sea that made separation, that distance was annihilated, that all were one, in mutual prayer and Eucharist. (= Thanksgiving: add, and *Faith*.)

“LITTLE CHILDREN KEEP YOURSELVES FROM IDOLS.”

1 *John* v. 20.



**1898 A Description of some Newly Discovered
Indigenous New Zealand Ferns.**

Transactions of the New Zealand Institute 31: 263-
266.

[Read before the Hawke's Bay Philosophical Institute,
10th October, 1898.]

CLASS III, CRYPTOGAMIA.

Order I. FILICES.

Genus 5. Hymenophyllum, Smith.

1. *H. alpinum*,¹⁰⁰⁷ sp. nov.

Plant small, terrestrial, creeping, glabrous, caudex very long, horizontal, intermixed, bare, with a few small fine red hairs scattered on rootlets. Stipe flexuous, suberect, slender, wiry, 2 in.-3 in. long, woody, terete, smooth. Frond tri-subquadripinnate, deltoid, $\frac{3}{4}$ in.-2 in. long, generally much recurved and compacted, dark-green, frequently possessing reddish spots, and bearing a rusty tinge (red-brown in age); main rhachis bare below, above with subrhachises narrowly winged, serrate; pinnae irregularly and closely overlapping, ultimate pinnules subflabelliform; lobes narrow-linear, truncate, coarsely serrate; tips sometimes dilated and 2-3 serrulate; single-veined; veins stout, not extending to tips. Involucres very few, solitary, supra-axillary in upper pinnae, free, substipitate, pale-green; valves rather large, cut nearly to

1007 *Hymenophyllum multifidum* (Forst.f.) Swartz.

base, oblong; tips broad; margins entire, purplish; receptacle stout; capsules large, compact.

Hab. Ruahine Mountain-range, alpine woods, east side; 1898: *Mr. H. Hill*. Same mountain-range, common; 1845–52: *W.C.*

Obs. I. This species is near *H. truncatum*, Col. (Trans. N.Z. Inst., vol. xxiii., p. 390), but differs from that species in several characters, particularly in its very long, wiry, flexuous, bare, and glabrous stipe, which is also remarkably tough, though extremely slender; its fruiting fronds are very few.

II. This fern is the mountain species referred to above; *l.c.*, p. 391. [264]

2. *H. oligocarpum*,¹⁰⁰⁸ sp. nov.

Rhizome long, wiry, harsh, creeping, blackish, bare, with a few rootlets. Stipe 2½ in.–3 in. long, filiform, wiry, naked, dark-brown. Frond erect, ¾ in.–1 in. apart, glabrous, sub-ovate-acuminate, 2½ in.–3 in. long, 2 in.–4 in. wide, rather irregular in outline, bipinnate, membranous, decurved, bright emerald-green; pinnæ free; midrib, rhachis, and subrhachises prominent, slender, blackish throughout, winged, denticulate-serrate, the wings of subrhachises broader, secondary pinnæ rather distant; lobes linear, sharply serrate, teeth distant, tips obtuse-truncate, sometimes denticulate. Involucres large, few, solitary, supra-axillary in upper secondary pinnæ, and extending to tip of frond, free, pedicelled, erect and drooping; pedicel often winged on one side,

1008 *Hymenophyllum multifidum* (Forst.f.) Swartz.

with a short lobe or tooth on the other; valves large, broadly obovate, entire, smooth, shining, cut half-way down, immature closed and much curved together, mature open, gaping. Receptacle stout, largely exserted; capsules few, red.

Hab. Forests, Waikaremoana, Hawke's Bay; 1898: *Mr. H. Hill.*

Obs. A species allied to *H. multifidum*, but differing in several characters, particularly its irregular and open pinnæ and pinnules, its few solitary pedicelled sori, and largely decurved involucre; the cells, too, of its frond are different, as shown in the plate of the type specimen of *H. multifidum*, Sw. (Hk. and Grev., Ic. Fil., t. 167), and Baker describes its sori: "1 to 12 to a pinna, terminal on the lateral segments of the upper pinnæ on both sides" (Sy. Fil., p. 69).

Genus 18. *Asplenium*, Linn.

1. *A. symmetricum*,¹⁰⁰⁹ sp. nov.

Plant small, tufted, upright, drooping; rootstock compact, 8–10 fronds. Stipe 1 in. long, greenish, subsucculent, thickish, clothed at base with long deltoid acuminate scales. Frond subovate-lanceolate, 3 in. long, 1 in.–1¼ in. wide, bipinnate, membranaceous, glabrous, dark-green; rhachises scaly and pinnæ sparsely so, with smaller scattered scales; pinnæ alternate, oblong, obtuse, regular, 9–10-jugate, close but not overlapping, each having 3–4 pairs of pinnules; pinnules all stalked and distant, free throughout, cut to base into 4–5–6 lobes; the lowermost

1009 Uncertain, possibly *Asplenium richardii* Hook.f.

pinnule on upper side of subrhachis, and always the largest, 6-lobed; lobes long, linear and linear-lanceolate, flat, narrowly margined, very acute, rarely bifid, tips pointed, single-veined; veins central, not extending to margins, their tips prominent on upper surface, white. Sori general throughout; one cluster on vein in each lobe red. Involucre rather large, white, oblong-lanceolate, ends acute; [265] margins entire, very thin, not extending beyond margin of lobe. Scales (basal) deltoid-acuminate, 3 lines long, their margins distantly serrate-lobed, tips very narrow-elongated; cells large, unequal, parallelogrammatic, and extending to tips, their margins black and very stout.

Hab. Hills (altitude 2,000 ft.) near Rangiora, North Canterbury; 1898: *Mr. T. Keir.*

Obs. This strikingly neat little fern is allied to *A. colensoi*, Hook, f., with which it has been hitherto classed, but is very distinct in many particulars—in colour, size, form, and general appearance; its pinnæ are more regular and closer, all pinnules free, many-lobed, and stipitate; scales larger and differently shaped.

Genus 8. *Cystopteris*, Bernh.

1. *C. laciniatus*,¹⁰¹⁰ sp. nov.

Plant terrestrial, tufted, suberect and drooping, membranaceous, glabrous, light-green. Stipe slender, flattish above and slightly canaliculate, subsucculent, pale, 3½ in.—4½ in. long, a few small scales and reddish hairs at base and scattered scales a short distance up

1010 *Cystopteris fragilis* (L.) Bernh.

stipe; scales very delicate, light-brown, ovate-acuminate-caudate. Frond ovate and ovate-deltoid, much acuminate, 6 in.–8 in. long, 4 in.–4½ in. wide, bipinnate (subtripinnate lower pinnæ); pinnæ subopposite, patent, horizontal, loose, distant below closer above, rhachis very slender; pinnules distant, stipitate, pinnatifid, deltoid-acuminate, acute, lowermost with 8–10 segments; segments stipitate, ovate, obtuse, decurrent; secondary segments ovate, deeply cut or lobed; lobes irregular, laciniate, sharply toothed, tips truncate and bifid, veined; veins white, decurrent, and collateral on stipes of pinnules. Sori numerous, small, distant, scattered, blackish, shining, central on vein, regular, 2–4 on a segment, extending to ultimate lobe. Involucre small, oblong, tip obtuse, retuse, sometimes bifid and lacerate, very membranous, white, shining, sparsely echinate, margins entire; at first covering sorus.

Hob. North Canterbury, New Zealand; 1898: *Mr. T. Keir, Rangiora.*

Obs. It is not without some doubt, and much research and long examination, that I describe this fern as a new species, for it is certainly pretty closely allied to *C. fragilis*, Bernh., and its varieties. It differs, however, considerably from them all, and did I not possess ample correct botanical drawings with dissections of them (Hooker's "British Ferns" and "Flora Tasmaniæ," Beddome's "Ferns of British India," &c.) I should hesitate to do so. This fern, however, is much larger, and possesses characters which those ferns do not, [266] particularly in its stipitate pinnules, which are also largely laciniate, with lobes bifid and sharply toothed,

and in its involucre, which is much more oblong and obtuse with entire margins; whereas in *C. fragilis* and all its varieties their involucres are always shown broadly ovate, their bases largely rounded, very acuminate, with finely serrulate margins. Hooker refers to his figure of the Tasmanian fern (*C. fragilis*, var. β) as being identical with the known and described New Zealand species or variety; but that is widely different from this plant.

**1898 Phænogams: A Description of a few more
Newly Discovered Indigenous Plants; being a
Further Contribution towards the making
known the Botany of New Zealand.**

Transactions of the New Zealand Institute 31: 266-
281.

[Read before the Hawke's Bay Philosophical Institute,
10th October, 1898.]

CLASS I. DICOTYLEDONS.

Order I. RANUNCULACEÆ.

Genus 1.¹⁰¹¹ Clematis, Linn.

1. *C. hillii*,¹⁰¹² sp. nov.

1011 WC: The numbers of the orders and genera given here are those of them in the "Handbook of the New Zealand Flora."

1012 *Clematis parviflora* A. Cunn.

Branches very long and slender, climbing; bark dark-purple, striate, ribbed. Leaves and flowers together at regular distances 3 in. apart, opposite on branches. Leaves on slender petioles sub 3 in. long, densely hairy; leaflets small, ternate, petiolulate, broadly ovate, sometimes suborbicular, $\frac{1}{2}$ in. (rarely $\frac{3}{4}$ in.) long, margins entire, sometimes irregularly cut and serrate, base dimidiate; green; veined, veins prominent and dark on under-surface; veinlets anastomosing; hairy on both surfaces, hairs shining, pale ferruginous; petiolules very slender, 2–3 lines long. Flowers few, often 3 together in short panicles; peduncles and pedicels stout, densely pubescent. Sepals 5, tawny, very silky-hairy on outside, subovate-lanceolate, obtuse, tips truncate and jagged; 5-veined; veins dark. Stamens numerous, 20 or more; filaments linear-lanceolate; anthers suborbicular or broadly elliptic, flat, tips very obtuse.

Hab. Forests, slopes Ruahine Mountain-range, east side; October, 1898: *Mr. H. Hill.* [267]

Obs. I. A distinct species, allied to *C. parviflora*, but widely different in sepals and anthers.

II. Named in honour of its discoverer, Mr. Henry Hill, F.G.S., Inspector of Schools, who has often visited that mountain region, bringing therefrom many of its botanical novelties, described by me in papers in the Transactions.

Genus 3. *Ranunculus*, Linn.

1. *R. uniflora*,¹⁰¹³ sp. nov.

Plant very small, perennial, tufted, erect, spreading, about 1 in. high. Rootstock hard, woody; rootlets few, wiry, descending. Leaves few, 4–6, subdeltoid, 2–3 lines long, trifoliolate; lobes suborbicular, sessile, entire, terminal one largest, 1–1½ lines broad, lateral much smaller, thickish, veins obsolete, light-green; petioles ½ in.–¾ in. long, stout, sheathing half-way up; sheaths large, membranous, white. Flowers solitary, one on each plant; scape stout, shorter than petioles, with a spathe-like bract encircling, stem a little below calyx, white, membranous. Sepals 3, suborbicular, very thin, pale-yellow. Petals 4, yellow, shining, obovate-spathulate; claw narrow; nectary below middle, foveolate. Filaments short; anthers elliptic. Achenes few, turgid, roughish; tips filiform, curved; head of fruit small, green.

Hab. Waikaremoana, Hawke's Bay; October, 1898: *Mr. H. Hill.*

Obs. A species near *R. acaulis*, Banks and Solander, but differing in several characters—e.g., not stoloniferous, leaflets always entire, petioles largely sheathing, scape with a bracteolate spathe under calyx, petals fewer and differently shaped, and achenes roughish. In size, too, it is much smaller than *R. acaulis*. This very small size is general; I have upwards of a dozen plants, which are nearly alike. I may further remark that *R. acaulis* is

1013 Possibly *Ranunculus acaulis* Banks & Sol. ex DC.

largely delineated with dissections in Hooker's "Flora Antarctica": Auckland and Campbell Islands, vol. i.

Order III. CRUCIFERÆ.

Genus 4. Cardamine, Linn.

1. *C. xanthina*,¹⁰¹⁴ sp. nov.

Plant herb; perennial, small, depressed; leaves spreading horizontally, subrosulate; root long, thick, white, tapering. Leaves radical, numerous, imbricate, with a few on flowering-stem near its base, glabrous and slightly hairy, spatulate-acute, $1\frac{1}{2}$ in.– $2\frac{1}{2}$ in. long, membranous, much and deeply cut, sinuate-lobed, subpinnatifid; lobes regularly opposite their margins, variously cut and toothed, decreasing gradually to [268] petiole; petiole $\frac{3}{4}$ in.–1 in. long. Flowering-stems (several) horizontal and suberect, 5 in.–7 in. long, terete, slender, greenish and purple, having (with pedicels) curious small scattered white hooked hairs reversed. Flowers few, solitary, 2–3 scattered on stem from middle upwards on long slender pedicels and 4–6 together forming a small loose corymb at top. Calyx sepals 4, oblong, green-purple striped, subechinate, 2 outer slightly concave, their tips obtuse and involute, 2 inner tips acute, with membranous white margins. Corolla 5 lines diameter, bright-yellow, patent, shining, flat, vertical; limb suborbicular-obovate, gradually decreasing from below middle to base; tip slightly truncate. Stamens stout, 4 long, 2 short; style $1\frac{1}{2}$ lines long, stout, erect (with pod), as long as long

1014 Thought to be an introduced weed.

stamens; stigma large, circular, densely pubescent. Pod $\frac{3}{4}$ in.—1 in. long, linear-subterete, slightly compressed. Seeds oblong, light-brown, smooth.

Hab. Napier, in house-paddock; flowering October, 1898: W.C.

Obs. I. This little plant has caused me much research and diligent examination, not only from its being wholly new to me, but from its bright-yellow and striking flower, its long style, its large bushy stigma, and its subterete pod; so that it scarcely belongs to the true *Cardamine* genus, as laid down by Bentham and others—*i.e.*, flowers “white,” pods “flat,” and seeds “pitted”—not notwithstanding its resemblance—*primâ facie*—to some of Sir J.D. Hooker’s Auckland and Campbell Islands *Cardamine*—as given in his drawings of them in his Flora of those islands—is very great. Moreover, while Bentham says of the genus the flowers of *Cardamine* are “white” (and certainly all our known southern species are so) and their seeds “pitted,” yet we have a British *Cardamine* with coloured flowers—*e.g.*, *C. pratensis*: and *C. purpurea*, a North American species, has dark-purple flowers; and I notice in the “Index Kewensis” a *C. flavesrens*, which, not knowing it, I suppose to have yellowish flowers; and Bentham himself, in his “Flora Australiensis,” describes four species of Australian *Cardamine* with their seeds “not pitted.” (*l.c.*, vol. i., pp. 69, 70); and Hook, f., in his ample descriptions of the *Cardamine* of Auckland and Campbell Islands, describes two species as having pods “linearibus compresso-tetragonis.”

II. Further, I am not certain of my plant being truly indigenous, for, were it so, I must surely have noticed its striking open bright-coloured flower attracting notice. Last year I found three small plants, distant from each other, growing in the side of the pathway to my house, which, from their appearance, were from the year before. This pathway had been then—in the former year—cleared out and laid down thickly with limestone gravel from the quarry. At first sight I [269] supposed them to be shepherd's purse (*Capsella bursa-pastoris*), which grows here plentifully; and I am pretty certain this plant is not of any described Australian cruciferous genera. I have, however, now plenty of specimens, and shall send some shortly to Kew for examination.

Order XXVI. DROSERACEÆ.

Genus 1. Drosera, Linn.

1. *D. ligulata*,¹⁰¹⁵ sp. nov.

Plant perennial, small, suberect, 1 in.–1½ in. high; rootstock thickish, hard, black, much branched; branches finely and thickly woolly-hairy. Leaves radical, few, erect and spreading, thickish, linear, 9–10 lines long, $\frac{1}{10}$ in. wide, red and reddish-green, tip obtuse, subapiculate, knobbed on upper surface, and shining, the apical half or more glandular above; glands long, erect, spreading, flat, white, their tips dark-red, ciliate at margins, the central ones sessile; petioles long, bases widening, enwrapping, membranaceous, nerved; Scape erect, slender, bare, as

1015 *Drosera arcturi* Hook.

long as leaves or longer, rarely shorter, black (also calyx), 1-flowered (one specimen bore 2 scapes, one being much smaller). Calyx longer than corolla, sepals cut nearly to base, oblong, subacute. Corolla, petals oblong, membranous, nerved; tips obtuse, pale-brownish (dried). Stamens as long as petals, slender, spreading, curved; anthers elliptic, whitish or pale-yellow. Styles 3, stout; stigmas large, suborbicular, thickish. Ovary large, broadly oblong, longer than calyx, shining.

Hab. Ruahine Mountain-range, in low-lying wet spots; 1898: *Mr. A. Olsen.*

Obs. A species having affinity with *D. polyneura*, mihi (Trans. N.Z. Inst., vol. xxii., p. 460).

2. *D. atra*,¹⁰¹⁶ sp. nov.

Plant small, perennial, erect, 1 in. high, bearing 7–8 leaves; rootstock thick, bushy, roots many, wholly blackish save corolla. Leaves radical, sub 1 in. long, spatulate, limb 4–5 lines long, densely glandular the whole upper surface, glands long and dark; petioles slender, $\frac{3}{4}$ in. long, nerved. Scape erect, slender, bare, 1-flowered. Calyx-lobes cut one-third length, large, broad, truncate, margins of tips serrulate-crenulate. Corolla white, twice as long as sepals. Stigma large, tuberculate.

Hab. Ruahine Mountain-range, east side, wet spots near summits; 1898: *Mr. A. Olsen.*

1016 *Drosera arcturi* Hook.

Obs. Only one specimen received—among other plants *in situ*—but a good one; and, while near the preceding species, bears differential characters. [270]

Order XXXVIII. RUBIACEÆ.

Genus 1. *Coprosma*, Forst.

1. *C. lanceolata*,¹⁰¹⁷ sp. nov.

A large shrub or small tree (specimens); branchlets stout;, woody, 6 in.–8 in. long, wholly glabrous; bark pale-brown, smooth, regularly scarred sub 1 in. apart, the main branch having an angled subtetragonal form. Leaves 8–12 at top, rather distant, loose, spreading, shining, subrecurved, lanceolate, 5½ in. long (including petiole), 1¼ in.–1½ in. wide; tip very acute produced; base tapering, subcoriaceous, margins plain, very slightly uneven, dark-green above, pale below; veins 7-jugate; veinlets largely anastomosing; midrib prominent on both surfaces; petiole 1 in. long, stout, firm, smooth above, not furrowed, connate at base with stipules; stipules large, deltoid, broad and sharply pointed, cuspidate. Flowers not seen. *Fœm.*: Fruit (immature) subterminal, axillary on long peduncles ½ in.–¾ in. long, usually 3 drupæ together (sometimes 2 or only 1), sessile, with two long linear bracteoles at base. Drupæ broadly elliptic, 4 lines long, smooth, shining, with hollow crown. On same specimens higher up young undeveloped flower-buds—*alabastron*—on stout peduncles ¾ in. long, each bearing

1017 Possibly *Coprosma lucida* J.R. & G.Forst var. *angustifolia* Cheesem.

three small clusters or fascicles, 2 on lateral subpeduncles opposite and containing 3 each, and the central one 5, all alike compact, sessile, erect, ovoid, every one enclosed in a simple cup-like calyx or perianth, showing at top 4—5 closely packed flowers, each cluster having a pair of long linear green leafy bracteoles at base.

Hab. Thickets, slopes Ruahine Mountain-range, east side; 1898: *Mr. H. Hill.*

Obs. This plant, though specimens received were incomplete, is so greatly diverse in its foliage and striking general appearance from all other *Coprosmae* known to me that I have no hesitation in describing it as a *species nova*.

2. *C. sagittata*,¹⁰¹⁸ sp. nov.

Shrub 8 ft.—10 ft. high, erect and diffuse (specimens 1 ft.—2 ft. long, straight); branches slender, glabrous; bark pale, smooth. Leaves submembranous, various in size, distant, scattered, glabrous, green above, rather dull, not shining, pale below, the largest 1 in. long $\frac{1}{2}$ in. wide, the smaller and more numerous less than half that size, broadly lanceolate, oblong, acute and obtuse, base cuneate, tapering nearly to base of petiole; veins few—usually 5-jugate—foveolate; midrib prominent, lower half above; veinlets curiously and closely anastomosing; petioles narrow, 2—3 lines long, [271] when young green and subsucculent, closely dotted with red; stipules rather large, broad, glabrous, with narrow erect teeth, 2 being longer. Flowers single, axillary on short opposite branchlets, which are often forked at top, each having 2

1018 Possibly *Coprosma colensoi* Hook.f.

small leaves with a flower between them; calycine bracts 2, erect, leaf-like. *Masc.*: Corolla, bell-shaped, greenish dashed with purplish streaks, shining, 4 lines long, 6-lobed; lobes cut halfway down, subovate, acute, 1-nerved, spreading, revolute, stamens. 6, largely pendulous; filaments $\frac{1}{2}$ in. long, dark, flaccid, pubescent; anthers $3\frac{1}{2}$ lines long, linear, pale with a dark nerve running throughout, tip acuminate-apiculate; base largely sagittate, sharply acute. *Fœm.* (immature): Fruit only seen, solitary, sessile, suborbicular, green, shining, $1\frac{1}{2}$ lines diameter.

Hab. Forest near Dannevirke (barren); 1892: W.C. Slopes Ruahine Mountain-range; 1898: *Mr. H. Hill.*

Obs. A species near *C. fætidissima*, but differing in several characters, particularly in its peculiar long linear anthers apiculate and sharply sagittate, produced. Forster, who discovered and described *C. fætidissima*, establishing the genus on it, gives a dissection of its flowers showing a very differently formed anther, &c. ("Genera Plantarum," tab. 69).

Order XXXIX. COMPOSITÆ.

Genus 6. *Brachycome*, Cass.

1. *B. alpina*,¹⁰¹⁹ sp. nov.

Plant small, slender, slightly hairy, simple (sometimes, 2-branched); rhizome, 3 in. (and more) long, filiform. Leaves radical, scattered, suborbicular, 4 lines diameter,

1019 *Inc. sed.*

tapering, faintly crenate-lobed, lobes few, their tips pointletted-hardened from vein produced, dark-green above, paler below, membranaceous, much veined; hairs sprinkled, appressed, substrigillose, white, flat, subulate, strangulated, thicker on upper surface; petioles very slender, 1 in. long, canaliculate and dilated at base with membranous margins and patent hairs, dark purple-brown. Scape erect, 3 in.- $3\frac{1}{2}$ in. long, filiform, with 2-3 small linear distant bracts, glabrous but pubescent towards tip. Head small, drooping, 2 lines diameter. Involucral scales numerous, sub 20, linear, dark-green with a thick purple central nerve, margins membranaceous, white; tips acute, jagged. Florets few; ligulae white, revolute. Receptacle broad, naked, shining, alveolate. Pappus 0. Achene sublanceolate, $\frac{1}{10}$ in. long, slightly glandular, viscid.

Hab. Ruahine Mountain-range, east side; Feb., 1898: *Mr. H. Hill.* [272]

Genus 17. *Senecio*, Linn.

1. *S. tripetaloides*,¹⁰²⁰ sp. nov.

A small, neat, upright shrub, $2\frac{1}{2}$ ft.-3 ft. high, bushy above, main stem $1\frac{1}{2}$ in. diameter; bark grey.

Branchlets—peduncles and involucres—greenish, very slightly scurfy and glutinous. Leaves alternate, rather distant and confined to ends of branchlets, petiolate, broadly lanceolate or narrow-oblong, obtuse, slightly tapering, $1\frac{1}{2}$ in.-2 in. long, 9-11 lines broad (some smaller), coarsely and irregularly serrate, membranaceous, glabrous, light-green, paler below with

1020 Probably *Senecio perdicioides* Hook.f.

scanty fine white scurf; veins white, largely anastomosing on upper surface; petioles $\frac{1}{2}$ in. long, subterete, canaliculate, stoutish, pale-green. Flowers rather numerous, terminal, subcorymbose, loose, on long axillary slender peduncles 1 in.-2 in. long, each usually containing 5 (rarely 4-6) heads of florets on long slender pedicels $\frac{1}{2}$ in.-1 in. long, each having a leaf-like bract at base and a small linear appressed bracteole (sometimes 2-3) at base of involucre. Heads small, $\frac{1}{2}$ in. diameter, bright-yellow. Involucre erect, cylindrical, 3 lines long; scales 5, linear-oblong, 3-nerved, margins membranous, broad; tips obtuse, ciliolate. Ray-florets 3, spreading, equidistant; ligulæ broadly elliptic, $\frac{1}{4}$ in. long, tip obtuse, slightly 3-notched, smooth, subconcave, obsoletely many-nerved; style short, one-third length of ray, slender, curved, obtuse. Disk-florets 5, 5-lobed; lobes 3-ribbed, largely revolute; style long, much produced, stout, obtuse, curved. Pappus numerous, erect, length of tube of disk-florets and longer than involucre, scabrid, obtuse, white.

Hab. "Tatapouri" Hills, on east coast, ten miles north from Poverty Bay; also (earlier) north of East Cape: *Mr. H. Hill.*

Obs. I. The affinities of this plant are with *S. glastifolius*, Hook., though very distinct. The heads present a, peculiar appearance from each having only three spreading divergent ray ligulæ.

II. The description is taken from living specimens in Mr. Hill's garden, Napier, flowering November, 1897.

Order XL. STYLEDIEÆ.

Genus 1. Forstera, Linn.

1. *F. major*,¹⁰²¹ sp. nov.

Plant wholly glabrous, main stems 8 in. long, stout, naked, succulent, dark-reddish, forked; 2 branches, one 3 in. and one 2 in. long, stout, each having 2 branchlets of 2 in.–3 in. in length; branches and branchlets very leafy. Leaves close and spreading, broadly oblong, $\frac{1}{2}$ in. long, subsessile, tips [273] thickened with a circular pore above, light-green, margins recurved. Flowers terminal, on a long slender erect scape 2 in. long, bearing 2 flowers on short pedicels with 5 bracts at their bases half as long as perianths; bracts linear-lanceolate-obtuse, reddish-green (as also calyx), their tips slightly ciliolate. calyx-lobes oblong, 1-nerved, tips knobbed. Corolla longer than calyx, lobes broadly oblong-obtuse, membranaceous. Column summit subreniform, longitudinally trisulcated, ovary dark-reddish.

Hab. Ruahine Mountain-range, east side; 1898: *Mr. H. Hill.*

Obs. A much larger and stouter plant in all its parts than *F. sedifolia*, from the same locality, and nearly allied to *F. truncatella*, mihi (Trans. N.Z. Inst., vol. xx., p. 196).

Order XLI. CAMPANULACEÆ.

1021 Probably *Forstera bidwillii* Hook.f. var *densifolia* Mild.

Genus 1. Wahlenbergia, Schrader.

1. *W. pygmaea*,¹⁰²² sp. nov.

Plant very small, $\frac{1}{2}$ in. high, simple, tufted, glabrous; root 2 in. long, slender, hard, white; sometimes 2–4 branches (tufts) rising distantly from one long branched root.

Leaves radical, numerous, sub 20, close, spreading, somewhat verticillate, linear-spathulate, 4 lines long (including petiole), 1 line broad, tip rounded very obtuse, with 2 small crenulate serratures on each side, tapering gradually to base, pale-green, shining. Flower large (for plant), solitary, terminal, drooping; scape $\frac{1}{2}$ in.– $\frac{3}{4}$ in. high, very slender, bare. Calyx campanulate, 2 lines long, dark-green, 5-lobed; lobes cut halfway down, linear-acuminate-obtuse, 1-nerved. Corolla 5 lines long, sub $\frac{1}{2}$ in. diameter, white, lobes pale-blue, 2-nerved, triangular, subacute, half length of corolla. Style flat, 2-nerved, densely minutely tuberculate on each side and upwards to top of stigma; stigmas 2, oblong-lanceolate.

Hab. Ruahine Mountain-range, west side, near summits; 1848: W.C. East side; 1898: *Mr. A. Olsen.*

Obs. This is a peculiarly striking little plant, from its uniform size and pleasing appearance, a rather large drooping bell-flower springing from its little squarrose moss-like tuft of leaves. As I first made its acquaintance in its alpine habitat fifty years ago, and sent specimens to England—probably not quite perfect—I think it may have been considered as identical with *W. saxicola*, A. DC., but that plant is different in several characters; a good drawing of it, with dissections, is given by Sir W.J.

1022 *Stet.*

Hooker in "Icones Plantarum" (tab. 818), under the name of *W. albomarginata*. [274]

Order XLII. ERICEÆ.

Genus 1. Gaultheria, Linn.

1. *G. calycina*,¹⁰²³ sp. nov.

Shrub (from specimen, apparently erect growth), branch 5 in. long, subflexuous, slender, 1 line diameter; outer bark silvery-grey, longitudinally furrowed, bearing 7 branchlets at top 1½ in.–2 in. long, dark-red, glabrous, very leafy. Leaves numerous, suberect and spreading, oblong-lanceolate, 8 lines long, 3 lines broad, flat, margins serrulate, teeth blunt; tip subacute, thickened, a little knobbed; base slightly tapering; pale-green, much veined on both surfaces, veins anastomosing, translucent; petioles sub 1 line long, stout, red. Flowers terminal in small corymbs 1 in.–1½ in. diameter; peduncles much bracteolate, bracts pale-green, deltoid-ovate-acute, patent, pedicels stout, 1 line long, curved, with 2–3 spreading bracts at base. Calyx rather large, inflated, pale-green, 5-lobed; lobes ovate, acute, thin, margins entire. Corolla tubular, red, 2 lines long, 5-lobed; lobes small, recurved, obtuse.

Hab. Ruahine Mountain-range, east side; 1898: *Mr. A. Olsen.*

Obs. A species having affinity with *G. glandulosa*, mihi (Trans. N.Z. Inst., vol. xxviii., p. 600).

1023 *Gaultheria subcorymbosa* Col.

Genus 2. Pernettya, Gaud.

1. *P. polyphylla*,¹⁰²⁴ sp. nov.

Plant a small twiggy glabrous under-shrub, semi-prostrate and suberect; branches spreading, 4 in.–5 in. long, slender, bearing many short branchlets, which are sometimes branched, $\frac{1}{2}$ in.– $\frac{3}{4}$ in. long, subsecund, and erect. Leaves numerous and closely set on tips of branchlets, quadrifariaously disposed, subdecussate, erect, imbricate, linear-lanceolate, sub 2 lines long, margins entire, 3-nerved, tips obtuse, thickish, pale-green; petiole $\frac{1}{2}$ line long, stout, reddish, terete, swollen at base.

Flowers few, terminal, solitary on tips of branchlets; peduncle short, bracteate; bracts broadly ovate, pale-brown, appressed. Calyx small, lobes ovate-acuminate, tips minutely ciliolate, margins membranous, finely serrulate. Corolla linear-tubular, 2 lines long, reddish-brown, slightly hairy within; lobes one-third length, linear-acuminate-acute, recurved, densely woolly-pilose with white hairs, smooth, shining without. Anthers included, linear-oblong, dark-red. Style shorter than anthers; stigma capitate. Fruit globular, size of a small pea, dark-red, shining, style persistent.

Hab. Ruahine Mountain-range, east side, secondary summits; 1898: *Mr A. Olsen.*

Obs. A strikingly neat little plant, with showy fruit. [275]

1024 Probably *Pernettya pumila* (J.R. & G.Forst) R.Br.

Genus 8. *Dracophyllum*, Lab.

1. *D. brachycladum*,¹⁰²⁵ sp. nov. to here

Apparently from specimens a medium-sized shrub; specimens 5 in.–8 in. long: one specimen—branchlets 18–20, sub-verticillate, 2 in.–3 in. long, crowded on top of branch; and in another specimen extending: on main branch 1 in. apart—erect, very slender, $\frac{1}{2}$ line or less wide; bark reddish-brown, glossy, irregularly and deeply ringed. Leaves 10–12, terminal, opposite, loose, open, spreading, filiform, sub 1 in. long (decreasing in length upwards), $\frac{1}{25}$ in. wide, 1-nerved, much recurved throughout their whole length, their bases greatly enlarged, $1\frac{1}{2}$ lines wide, and many-nerved. Flowers terminal, erect, 5–6 together in a short broad spike 6–9 lines long; calycine bracts nearly as long as flowers, their bases large wrapping, tips suddenly acuminate, subacute. Calyx narrow, sublinear-acuminate, tip acute, longer than style. Corolla red, narrow tubular, 3 lines long, expanded at base, and many-nerved (10); lobes 5, half as long as tube, deltoid, recurved, 1-veined, tips acute, margins incurved. Anthers narrow-oblong, margins straight parallel, base and apex abrupt truncatulate. Style 1 line long, stout; stigma rounded, black, smooth, shining. Scales small, half as high as capsule, broadly cuneate, apex rounded.

Hab. Ruahine Mountain-range, east side; 1898: *Mr. H. Hill.*

1025 *Dracophyllum recurvum* Hook.f.

Obs. A species near *D. rubrum*, Col. (Trans. N.Z. Inst., vol. xx., p. 200), and also near *D. tenuicaulis*, Col. (vol. xxii., p. 476).

Order L. BORAGINEÆ.

Genus 1. *Myosotis*, Linn.

1. *M. polyantha*,¹⁰²⁶ sp. nov.

Plant perennial; rootstock thick and bushy, with many long fine roots and rootlets, blackish. Leaves many, radical, petiolate, broadly oblong, 8 lines long, 5 lines broad (some smaller), apex subacute, base tapering, much veined; petioles 9 lines long, very slender; upper surface closely covered with white sparkling dots, from each a single hair springs. Flowering-stems several, 8 in.–10 in. long, forked, spreading, leafy two-thirds of length; leaves similar to radical but smaller, and becoming gradually less in size upwards; each raceme bearing 8–15 rather distant flowers; pedicels slender, 1 line long. Calyx green, coarsely veined, rough with short hairs arising from white circular dots, as in leaves; lobes cut half-way down, linear-ovate; tips sharply acuminate, ciliate hairy. Corolla small, 2 lines long, 1½ lines diameter, veined; scales small, narrow. Anthers ovoid, obtuse, cordate-acuminate. [276] Style very long, longer than calyx; stigma small, clavate.

Hab. Ruahine Mountain-range, east side; February, 1898:
Mr. H. Hill.

1026 *Myosotis forsteri* Lehm.

2. *M. tenuifolia*,¹⁰²⁷ sp. nov.

Plant small, erect, hispid; roots numerous, long, woody, wiry, blackish. Leaves radical, spreading; flower-stalk 3 in.–5 in. high, solitary, slender, sometimes two from one root; hairs white, strigose, scattered on leaves but close on stalk. Leaves radical, 6–8, petiolate, limb broadly oblong, $\frac{1}{2}$ in. long, 4 lines wide, smaller ones suborbicular, thin, margins entire; petioles slender, sub $\frac{1}{2}$ in. long, dilated at bases; on stem, 4–6, the lowermost pair opposite, petiolate; others sessile, smaller, scattered, alternate. Flowers terminal on raceme, 6–10, distant, pedicelled; pedicels slender, $1\frac{1}{2}$ lines long. Calyx green, campanulate, 2 lines long; lobes cut halfway down, spreading, ovate-acuminate, tips acute, 3-veined, margins ciliate; hispid on veins, which are ridged and coloured. Corolla small, pale-pinkish; tube cylindrical, narrow; lobes large, rounded, veined. Scales of throat reniform, margins entire. Stamens short; anthers narrow ovate-cordate, tips produced above scales, obtuse. Style long, exserted; stigma small, globose. Nuts orbicular, light-brown, shining, slightly margined.

Hab. Ruahine Mountain-range, east side; 1898: *Mr. A. Olsen.*

Order LIII. SCROPHULARINEÆ.

1027 *Myosotis forsteri* Lehm.

Genus 7. Veronica, Linn.

1. *V. truncatula*,¹⁰²⁸ sp. nov.

Shrub small, glabrous; branchlets erect, opposite, woody, slender, $2\frac{1}{2}$ in.–3 in. long, $\frac{1}{12}$ in. diameter, regularly ringed, scars $\frac{1}{10}$ in. distant; bark grey, longitudinally furrowed. Leaves terminal, rather numerous, 12–15, patent, spreading, sub narrow-ovate, 1 in. long, 2–3 lines wide, sessile; tip truncate, thickened; midrib rather prominent below; submembranaceous, light-green. Flowers small and closely set in a narrow subterminal raceme, 1 in. long, pedicelled; pedicels $\frac{1}{2}$ line long; bracts small, oblong. Calyx small, 1 line long, 4-lobed; lobes oblong, obtuse, pale-green, 1-nerved, with white membranous margins. Corolla small, 2 lines diameter, white; lobes nearly equal; tips rounded. Stamens excluded; anthers subcordate, tips acute; style erect, straight, longer than stamens; stigma capitate.

Hab. Ruahine Mountain-range, east side; February, 1898:
Mr. H. Hill.

Obs. I do not know of any New Zealand species of this [277] genus that this one is closely allied to, or may be compared with. At first sight its pale-green narrow foliage reminded me of some species of *Pimelea*. Its small close-set flowers, with their light-green calyces bordered white, and clear light-green narrow leaves with their peculiar truncated tips, are good characters.

2. *V. azunea*,¹⁰²⁹ sp. nov. (*non* Link.).

1028 *Hebe truncatula* (Colenso) L.B.Moore.

1029 *Hebe venustula* (Colenso) L.B.Moore.

Shrub erect, branched, glabrous; branches generally having 3 short terminal branchlets, deeply and regularly ringed $\frac{1}{15}$ in. apart; branchlets slender, sub 2 in. long, 1 line diameter; leaves at tips subdistichous, 12–14, crowded, erect, ovate, 4 lines long, 2 lines broad, subsessile, subcoriaceous, strongly keeled; tip subacute semi-knobbed by the stout prolonged midrib; expanding at base, and closely appressed to branchlet; slightly concave and transversely wrinkled on upper surface at base. Flowers terminal in short compact corymbs of 4–5; pedicels 1–1½ lines long; bracts broadly ovate. Calyx as long as tube; lobes large, oblong, obtuse, slightly ciliolate. Corolla clear bright-blue, 3 lines diameter, limb-lobes rather large, nearly equal; tips of the 2 lateral ones and lower lobe rounded, of the upper subacute; tube 1 line long. Stamens stout, excluded; anthers largely cordate. Style longer than stamens, flexuous; stigma small, coloured, simple. [278]

Hab. Ruahine Mountain-range, east side; February, 1898:
Mr. H. Hill.

Obs. A striking and neat species from its small symmetrical foliage and its pretty bright-blue flowers—a colour rather rare in our New Zealand *Veronicæ*. Its nearest alliance is I think, with *V. buxifolia*, Benth.

3. *V. polypylla*,¹⁰³⁰ sp. nov.

A small low diffuse undershrub; branches hairy, long; branchlets woody, ascending, slender, 1½ in.–2 in. high. Leaves on top of branchlets, small, numerous, close, spreading, suborbicular, 2 lines diameter (some much

1030 Thought to be an introduced weed.

smaller), thickish, margins deeply crenate and subrevolute, their lobules thickened, glabrous, apical lobe large and very obtuse, base tapering, slightly hairy underneath and wrinkled; petioles 1 line long, slender; hairs short, scattered. Flowers rather large for plant, terminal, generally 2 together on separate peduncles, 1 line long, with very small subspathulate leaves at bases and between them. Calyx, sepals 4, cut nearly to base, linear, thick, obtuse, irregular in width. Corolla pale, whitish, 2 lines diameter, upper and 2 lateral lobes large, the lower smaller, all much veined, with tips rounded. Stamens short, curved; anthers large, suborbicular, cordate, flattish, pale, included.

Hab. Ruahine Mountain-range, east side; 1898: *Mr. A. Olsen.*

4. *V. subrosulata*,¹⁰³¹ sp. nov.

Plant very small, main stems slender, prostrate, subwoody, with little branches erect, 1 in.–2 in. apart, rising sub 1 in. and each bearing 2–3 minute branchlets, and each branchlet crowned with 10–12 minute leaves. Leaves close, subrosulate, and subimbricate, subobovate-orbicular, $\frac{1}{16}$ in. long, tapering, thickish, undulate-crisp, deeply crenate, margins much recurved, green above, brown and longitudinally rugulose below, very hairy (with young stems and calyces); hairs scattered, curved, white; petioles stout, nearly as long as leaves. Flowers large for plant, terminal, 2 together, each on a very short peduncle. Calyx 4-lobed, lobes oblong, very obtuse, margins straight-parallel, ciliolate. Corolla pure white, 4-

1031 *Parahebe spathulata* (Benth.) W.R.B.Oliv.

lobed, the 2 lateral and upper lobes broadly obovate or suborbicular, the lower lobe small and narrow, entire; tube short. Stamens short; anthers large, orbicular, dark-purple, scarcely excluded. Style erect; stigma subcapitate.

Hab. Ruahine Mountain-range, east side; February, 1898:
Mr. H. Hill.

Obs. An interesting little species—a gem!—pretty near *V. vulcanica*, mihi (Trans. N.Z. Inst., vol. xx., p. 203), which is also an alpine plant, but differing in several characters.

5. *V. subsimilis*,¹⁰³² sp. nov.

Shrub low and thick-growing; upper branches suberect and stout, cylindrical, scarred, $\frac{1}{4}$ in. diameter, thickly branched at top; branchlets square, erect, subsecund, 1 in.—2 in. long, $\frac{1}{12}$ in. diameter, leafy throughout; secondaries decreasing gradually in length upwards, so that their tips are nearly even, mostly simple, sometimes forked. Leaves quadrifarious, symmetrical, subvertical, deltoid, $\frac{1}{15}$ in. long, obtuse, sessile, connate, closely imbricate and adpressed, concave above, glabrous, thick, backs rounded not keeled; green, thickly dotted, dashed with red in age, the lower margins of young leaves densely mealy-white, subciliolate. Flowers small, crowded 3–4–6 together at tips of branchlets, sessile. Calyx-lobes oblong, very obtuse, tips rounded, obsoletely 3-nerved, submembranous, light-green, margins slightly incurved, densely ciliolate-woolly, wool-white. Corolla white, $\frac{1}{6}$ in. diameter, 4-lobed, lobes spreading, the two

1032 *Hebe subsimilis* (Colenso) Ashwin.

lateral and upper elliptic tips broad suborbicular, the upper lobe largest tip entire, lower lobe small; tube shorter than limb. Anthers suborbicular, large, much exserted. Style longer than stamens; stigma simple.

[279]

Hab. Ruahine Mountain-range, east side; February, 1898:
Mr. H. Hill.

Obs. A species *primâ facie* very like *V. tetragona*, Hook., and without dissection or careful comparison would be taken for it; but it differs in several particulars—as in leaves not keeled and tips rounded; calyx-lobes, tips rounded; corolla tube short; and upper lobe of limb entire, not bifid.

Order LXVII. THYMELEÆ.

Genus I. Pimelea, Banks and Solander.

1. *P. montana*,¹⁰³³ sp. nov.

Shrub, branches (specimens) 6 in. long, erect, stout, 2 lines diameter, bark chocolate-colour; branchlets woody, erect, slender, 2½ in. long, 1 line diameter, closely and regularly scarred, thickly black muricated between scars, with many short secondary branchlets at their tips 1 in.—1½ in. long, very leafy; the young branchlets densely clothed with coarse grey woolly hairs between the leaves. Leaves numerous, close, subdecussate, suberect, spreading, ovate, 4 lines long, obtuse, wrinkled, much keeled, pale-green, margined; margins translucent

1033 Possibly *Pimelea buxifolia* Hook.f.

yellow-green; petioles short, stout, thick. Flowers few, solitary, sometimes in pairs on tips of branchlets; perianth very hairy, shaggy, 5 lines long; hairs white; lobes 4, oblong, subapiculate. Anthers oblong, excluded. Style longer than stamens; stigma simple.

Hab. Ruahine Mountain-range, slopes, east side; 1898:

Mr. A. Olsen.

Obs. A species near *P. gnidia*, Forst., and also *P. subsimilis*, mihi (Trans. N.Z. Inst., vol xxviii., p. 609).

Genus 10. *Euphrasia*, Linn.

1. *E. pygmaea*,¹⁰³⁴ sp. nov. (*non* C. Koch).

Plant simple, minute, about $\frac{1}{2}$ in. high, erect, glabrous; root $1\frac{1}{2}$ in. long, slender, straight. Leaves few, generally 6, thickish, lowermost pair radical, opposite (seed leaves?), ovate, entire, obtuse; the next pair trifid or 3-lobed; the next cuneate-spathulate, limb 2 lines long, 7-lobed, the apical lobe large, rounded, the two lateral ones very small and distant, each 3-lobed; lobes, tips thickened, dark-green; limb pale, nearly white, tapering; petiole slender. Flower single, terminal, large for plant, sessile. Calyx 5-lobed; lobes deltoid, subacute, irregular in size, half as long as calyx. Corolla 3– $3\frac{1}{2}$ lines long; tube slender, long; lobes of limb large, rounded, 3-veined. Anthers glabrous, mucronate.

Hab. Ruahine Mountain-range, east side, secondary summits; 1898: *Mr. A. Olsen.* [280]

1034 *Euphrasia zelandica* Wettst.

Obs. I. I have lately received several 1-flowered specimens of this minute plant, all as described; and also—on a former occasion—some others, much larger, each bearing 2–3 flowers, terminal on short branchlets; which I take, without dissection, to be of the same species, and, if so, then the very minute 1-flowered specimens are young seedling plants.

II. Sir J.D. Hooker, in his “Handbook of the Flora of New Zealand,” under “*E. antarctica*, Benth., a native of Tasmania, Fuegia, and South Chili” (which plant I also originally discovered on Ruahine Mountain-range in 1845), mentions having received from Sir James Hector several forms of *E. antarctica* collected on Mount Alta, one of them being “a most minute form, $\frac{1}{2}$ in. high, with a single flower; altitude, 6,000 ft.” I at first supposed that this little plant might prove to be of the same; but Bentham describes *E. antarctica* as being “glandular pubescent,” with other marks of difference.

Order LXX. CUPULIFERÆ.

Genus 1. *Fagus*, Linn.

1. *F. truncata*,¹⁰³⁵ sp. nov.

A tree; branches (specimens 3 in.–4 in. long) slender; branchlets short; bark glabrous, dark purple-brown, irregularly ribbed and wrinkled. Leaves glabrous, rugulose, charta-ceous, dull-green above, paler below, subrhomboid-oblong, $\frac{3}{4}$ in.–1 in. long, 6–7 lines wide, very obtuse, base slightly tapering, margined; margins

1035 *Nothofagus truncata* (Colenso) Cockayne.

thickened, white, dentate; teeth, few, on upper half only, large, knobbed, caused by nerve being produced, generally 3–4 at truncate apex; midrib prominent beneath; nerves few (3–4-jugate), alternate, obsolete; veinlets closely anastomosing on lower surface, which is also finely dotted; petioles 2 lines long, narrow, slightly pubescent; leaf-buds narrow-ovoid, with 4 rows of scales, red-brown, shining. Flowers (male) on small branchlets, sub-corymbose, solitary and 2–3 together on short peduncles, subsessile, pedicels small. Perianth very thin, glabrous and shining, slightly glutinous, broadly campanulate, margin shortly cut into 5 broad teeth or lobes, obtuse, rounded, 1-nerved; filaments short, not exserted; anthers long, linear, reddish-brown, deeply sulcated.

Hab. Ruahine Mountain-range, east side; October, 1898:
Mr. H. Hill.

Obs. I. This plant is evidently allied to *F. fusca*, Hook.f., but differs from it in several characters—in its smaller leaves, which are also margined, their apices tri- or quadridentate, the teeth knobbed, and fewer nerves; its perianths very thin, glabrous and shining; and filaments not exserted. Sir J.D. Hooker, in his clear description of *Fagus fusca*, [281] says, “Branches clothed with minute pubescence, ... nerves of leaves conspicuous (*pinninerviis*)” [in his faithful drawing represented 6-jugate and opposite]. “Flowers ternate, pedunculate, drooping; perianth turbinate, 5–6-toothed, downy as well as peduncle. Filaments slightly protruded; anthers oblong” (“Icones Plantarum,” vol. vii., tab. 630).

II. I have received only two small specimens of this plant, both male, each possessing 12–14 leaves and 12–20 flowering perianths, apparently obtained as if casually gathered in passing; yet their difference is so great from *F. fusca, vera*, as described and ably drawn by Hooker, that I have considered it right to bring this plant to notice, even should it hereafter prove to be a variety only of *F. fusca*. A peculiarity in the leaves of these two specimens is that they are nearly all repeatedly bored through by some insects, twenty holes and upwards in some leaves.

Class II. MONOCOTYLEDONS.

Order I. ORCHIDÆ.

Genus 12. *Pterostylis*, Brown.

1. *P. trifolia*,¹⁰³⁶ sp. nov.

Plant small, glabrous, 2½ in. high; 3-leaved at base; leaves close, equidistant, spreading, flat, sessile, broadly oblong, 1½ in. long, 1 in. broad, tips very obtuse-rounded, many-nerved longitudinally, with veins largely anastomosing between nerves. Scape 1 in. long, stout, erect; flower solitary. Perianth 1¼ in. diameter, sepals and petals nearly equal in length, narrow, sub 8 lines long, membranous and veined, not long-tailed; tongue narrow, thickish, dark-red, tip subacute, exserted; appendage large, membranous, veined, erect, curved, tip acute; column wings upper and lower corners largely produced, tips narrow-acute. Capsule very stout, obovoid, sub 1 in. long, 4 lines diameter; sutures ribbed, thick.

1036 *Pterostylis venosa* Col.

Hab. Ruahine Mountain-range, east side, near secondary summits; 1898: *Mr. A. Olsen.*

Obs. Only a single specimen received, and that with withered (though perfect) perianth, so could not afford to break it up for closer examination. A species very distinct from all other New Zealand ones known to me.

1899 Of a Radiant Phenomenon: “In hoc signo vinces”¹⁰³⁷

Transactions of the New Zealand Institute 32: 305-309.

A Fragment left by the late W. COLENZO, F.R.S., F.L.S.

[*Read before the Hawke's Bay Philosophical Institute.*]

MEMORANDUM.—31st May, 1892: Returning this day by the express railway-train from Woodville to Dannevirke in a thick fog, I was suddenly struck with admiration and delight on seeing the exact image of the letters “N.Z.R.” and of the whole ornamental and coloured glasswork in the upper lights in the narrow raised roof clearly and beautifully shown high up in the foggy air, in altitude far above the roof of the carriage, and on its eastern side. Every fine and delicate line and point of tracery was most

1037 εν τούτῳ νίκα = in this sign, conquer.

distinctly produced, without any blurring or scumbling, and such was also continued, notwithstanding the rapid progress of the train, throughout its running in a straight direction, or in one suited to catch and reflect the beams of the sun. Of course, when the carriage deviated to the right or to the left the image vanished, but it was sure to reappear on the train again running in that same direction; and when the train stood still at any of the stations and keeping the same course the image was fixed. This happened between the hours of 12.45 and 1.15, when the sun had declined but little from its highest altitude (though naturally low in the heavens at this midwinter season), and when it was shining brightly through rifts and breaks in the dense fog and scattered white clouds; at times also the imagery was highly illuminated, becoming of a brilliant-red colour, and largely magnified. And again, when the sun shone out strongly, being quite clear of fog and of clouds, the reflected images were remarkably vivid red, dazzling the eyes. At such times the image of the sun itself would also be represented by an additional brilliant round and bright-red figure, partly encircling the other reflections, on which the eye could not remain momentarily fixed: this, however, was transitory. Sometimes the appearance of the legend "N.Z.R.," with its accompanying delicate ornamentation, was agreeably changed in its colour, becoming merely dark on a dead frosty-white background. And when the fog had wholly cleared away the same pictures were again vividly and faithfully produced against the deep-blue and clear sky: and all this show continued for a considerable time—more than half an hour.

Naturally it led me to think on the famous legendary sign in the sky, said to have been seen by the Emperor Constantine, [306] A.D. 312, and I exclaimed, “*Ecce signum!*” and the question arose in my mind whether that appearance in the sky was not caused in a similar kind of natural manner—by the sun’s rays striking down on such a device, which might have pertained to some one of the Emperor’s legionaries, and so reflected it high up in the sky.

Considering this matter has led me to look up what ancient history says of that famous sign (which I had nearly forgotten), and I find—(1) That it was not the sign of the cross at all as we moderns understand it; (2) that it was not even thought so much of at the time it was said to have happened; and (3) that those historians who were then living have given differing accounts of it, and also of the time or season of its occurrence.

As this story is, I think, little known to my audience, and also liable to much doubt, I will briefly mention a portion of what has been said about it.

But first of Constantine himself. At that very period he was not a Christian. This is clear from Eusebius (Bishop of Cæsarea), who, in his life of the Emperor (with whom he was in great favour), says, “In the commencement of his war with the Roman Emperor Maxentius he was still at a loss to what god he should trust himself and his affairs.”¹⁰³⁸ He was a deist of the lowest class, who considered the god of his father as a limited being, though more benevolent and powerful than any of the

1038 WC: Eusebius, “*De Vitâ Constantini*,” l. i., c. 27.

Greek and Roman deities. This is manifest from his regulations in favour of the Christians and from his laws tolerating the Pagan haruspices.

There is great difference of opinion as to the time when, and the place where, the Emperor saw this sign.

According to Eusebius he saw it while in Gaul, and when making preparations for the war with Maxentius.

Lactantius, however (a celebrated Christian historian and contemporary), states that Constantine saw the cross on the 26th October, 312, the day before the battle in which Maxentius was vanquished near Rome.¹⁰³⁹ Others (ancient writers) would compromise it by supposing there were two appearances of the cross, and both in dreams—the first in Gaul and the second in Italy. Again, some suppose it was a pious fraud, and others that it was a trick of State. The first supposition is most improbable, for at the time the cross is said to have appeared to him Constantine thought nothing about spreading the Christian religion, but only about vanquishing Maxentius. Besides, he was not then a Christian, and the event was not used for the advancement of Christianity, but for the animation of his [307] troops. The other supposition has more probability—indeed, we are told by Lactantius (*l.c.*, ch. 46) that the Emperor Licinus (brother-in-law of Constantine) once resorted to something of this kind. But if Constantine had been inclined to use artifice in order to encourage his soldiers he would far more probably have represented Mars, or some other of the common deities.

1039 WC: *De Mortib. Persecut.*, ch. 44.

An ancient writer has observed, “This sign is a subject involved in the greatest obscurities and difficulties. It is, however, an easy thing to refute those who regard this prodigy as a cunning fiction of the Emperor, or who rank it among fables; and also those who refer the phenomenon to natural causes, ingeniously conjecturing that the form of a cross appeared in a solar halo, or in the moon: and likewise those who ascribe the transaction to the power of God, who intended by a miracle to confirm the wavering faith of the Emperor. Now, all these suppositions being alike rejected, the only conclusion that remains is that Constantine saw in a dream, while asleep, the appearance of a cross with this inscription: ‘By this conquer.’”

But the splendid, clearly defined, and wonderful reflection in the sky mentioned above as seen and enjoyed by me seems to be another and still more reasonable and natural mode of accounting for that phenomenon, which appears to have escaped the notice of former writers. Indeed, Fabricius, in his learned work on this subject, admits that the appearance of visible words in the air cannot be explained; and so he resorts to a new exposition of the language of Eusebius for relief, and believes that the words “By this conquer” ($\tauούτω$ *víka* = *hoc vince*) were not actually seen, but that the sense of them was emblematically figured in a crown of victory that appeared in the heavens. But if the Emperor intended to say this he himself very obscurely caused the very words be affixed to the standards the legions, and to the medals



expressed
Moreover, he
mentioned to
(*labara*) of
and other

monuments of the event; and, further, all the ancient writers so understood the account given by Eusebius. Again (according to Eusebius¹⁰⁴⁰), the Emperor did not see the sign or form of a real cross, but the Greek letter X intersected perpendicularly by the letter ρ, thus—Eusebius says a great deal about it, also prefacing the Emperor's personal relation to him by remarking, “Perhaps had another declared this singular divine manifestation it would not easily be credited; but the victorious Emperor himself having related it to us, who write this, [308] when we had, a long time afterwards, the privilege of knowing and conversing with him, and having confirmed it with an oath, who can hesitate to believe the account ?” Then Eusebius goes on to enter into it very minutely, as he had the story privately from the Emperor's own lips, who affirmed “that about the middle hours of the day, as the sun began to verge towards its setting, he saw in the heavens with his own eyes the sign, with its legend, and amazement seized him and the whole army at the sight, and the beholders wondered as they accompanied him in the march.” And he said “he was at a loss what to make of this spectre (τὸ φάσμα), and, as he pondered and reflected on it long, night came upon him by surprise,” &c.

Now, if this relation is all true, how happens it that no writer of that age says one word about the luminous cross in the heavens? Lactantius mentions only the “dream,” in which Constantine was directed to use the sign of the cross; and the same is true of Sozomen (*lib. i., c. 3*), another ecclesiastical historian; and Rufinus, and others.

1040 WC: “*De Vitâ Constantini*,” 1. i., § 28–31.

Hence, too, it seems that the whole story was counted fabulous by the Pagans, which confirms the ancient statement and supposition that it was a dream. How came it that Eusebius himself said nothing about it in his "Ecclesiastical History," which was written about twelve years after the said event, and about the same length of time before his "Life of Constantine"? Why does he rely solely on the testimony of the Emperor, and not even intimate that he ever heard of it from others, whereas, if true, many thousands must have been eye-witnesses of the fact? What means his suggestions that some may question the truth of the story; and to confine himself simply to the Emperor's private representation to himself? And how came the whole story of the luminous cross to be unknown to the Christian world for more than twenty-five years, and then to be made known only through a private conversation between Eusebius and Constantine?

Here I may observe that the hour of the day, and almost the season of the year (as stated by Eusebius), and consequently the position of the sun in the heavens, pretty nearly correspond with the time and season in which I first noticed the phenomenon. Moreover, the onward movement of the train did not interrupt its appearing; and this also agrees with the march of the army. Further, the occasional fulgent image of the sun itself surrounding the other and darker imagery (as witnessed by me) serves to remind one of one of the ancient suppositions respecting that spectre seen by Constantine as being a solar halo. Of course, I do not mean to say that this which I have here adduced is the true solution of that old mysterious story, but merely that

it has much [309] more of natural and reasonable supposition in it than any other (as far as I know) yet brought forward. And, further, the peculiar and true form of the so-called cross, or sign, as clearly given by Eusebius, both in words and in a figure, seems not unlike in outline that of a disarranged and multilated bundle of fasces as borne by the Roman lictors, with the small axe jutting out from the top instead of the middle of the broken bundle. Now, supposing the particular date of the sign being seen as given by Lactantius to be correct, would such a figure as a spoiled and broken bundle of fasces be considered as an ill-omen against Maxentius and the Roman army?

In fine, I may add that I have very often since seen the same reflected figures when travelling over the same ground in the express train on sunshiny days, though never so beautifully and vividly shown as on that day of dense white fog. I dare say that many other passengers may also have noticed it, though to see it at all one must keep close to the glass window and look up above the altitude of the carriage, and there, with attention and a fixed gaze, watch for its appearance.

**1899 Memorabilia, Ancient and Modern; being
Remarks and Information respecting some of
the Tin-mines in Cornwall, England.**
Transactions of the New Zealand Institute 32: 309-
324.

*A Fragment left by the late W. COLENSO, F.R.S.,
F.L.S. [Read before the Hawke's Bay Philosophical
Institute.]*

The minerals of the kingdom, of lead, iron, copper, and tin, are of great value. BACON.

— valiant as a lion,
And bountiful as mines of India.

SHAKESP., *King Henry IV.*, part i., act iii., sc 1.

FOR some time past I have been desirous of bringing before you a few statements and remarks on the tin-mines of Cornwall. Several circumstances combined have induced me to attempt to do so: (1.) My being a Cornishman by descent and birth, and having still a clear remembrance and recollection of what I had there seen in connection with the mines in my youthful days (seventy years ago!), some being peculiar and but little known here at this end of the globe, and some of them very likely have become inefficient and obsolete through the continued and rapid advances of science during a long lapse of seventy years. (2.) Certain public occurrences [310] that have lately taken place both here in New Zealand and in Australia—as the rich gold-mining at Coolgardie and other places in Australia and in the

Thames district in New Zealand, and also the great number of the unemployed everywhere among us; these two diverse matters considered together with what has recently taken place in connection with the mines at Home in Cornwall, of which I intend more particularly to speak in this paper. (3.) My possessing some interesting specimens of tin-, copper-, lead-, and iron-ores from the Cornish mines, which I should like to show you (these mementoes from Home have been in my possession nearly sixty years, having been early sent to me by my uncle, the father of the late Bishop Colenso, of Natal, who for many years held the office of Mineral Agent in the Duchy of Cornwall).

The County of Cornwall, as no doubt you all well know, is both the southernmost and westernmost county of England. It is of peculiar configuration in its outlines, long, narrow, and irregular, being surrounded on all sides but one by the ocean for more than seven-eighths of its total circumference, save where it joins on its eastern end to the County of Devonshire, which is also its broadest part. The westernmost headland or extremity is the Land's End, and the southernmost point or cape is the Lizard—often the last portion of Old England seen by the voyager or emigrant on his leaving the old Mother-country for New Zealand.

Geologically speaking, the country is very rocky, the principal stone being granite.

Cornwall has long been famous for its tin. We find in the earliest histories that the Phœnicians traded into Cornwall for tin before the invasion of Britain by Julius Cæsar, or, in other words, long before the Christian era. But I am

not, at present, going into the ancient history of Cornwall—of its distinct people and language, or of its Druidical and prehistoric remains; valuable information on these subjects may be obtained from books in our library. I shall confine my remarks to the proper subject of this paper—viz., its mines and staple industry of mining.

Tin-ore is obtained by two principal processes, which are widely different from each other; the one is called “mining,” the other “streaming” (“tin-streaming”). The first, or mining, is carried on by sinking deep shafts perpendicularly in the earth, and by following in every direction the course or veins of the metal tin, often horizontally and irregularly disposed in the granite and other stones. This mode of mining includes many modern and scientific operations, and can only be carried out at an enormous outlay. The ore—that is, the metal in the stone—when brought to the surface has to be [311] broken up into very small fragments by powerful machinery, and the tin extracted. This class of mining gives employment to many hundreds of labourers, including women and children. The second mode, or streaming, is much more primitive and easy. This may be termed “surface work,” as it is generally carried on in moorland plains and valleys, in shallow pits of only a few feet in depth, and at but a small distance below the surface of the ground. The tin is here found deposited in blackish sand-like particles, in small, worn, brown lumps or pebbles, with occasionally a few larger pieces. I have seen such pieces (or nuggets) of almost pure tin weighing from 12oz. to 20oz. The variety known as “wood tin” is of a lighter colour, variegated, striped, and pretty. Tin

thus procured is cleaned from sand and earth by simply washing in water, as from its great weight and purity it speedily sinks, when it is collected and laid out to dry.

A large number of tin- and copper-mines are irregularly scattered all over the county, but more particularly in its western half, some being romantically situate on the top of high hills, sea-cliffs, and crags. The mines in the Parish of St. Just, near the Land's End, are among the most remarkable in Cornwall, no less from the great variety of unusual minerals which they have produced than from the fact of the direction of the veins seaward having tempted the miners to follow them to long distances under the billows of the Atlantic Ocean. From among them I would especially mention three—Botallack, Levant, and Dolcoath; these being also A1 among the principal metal mines in Britain. Very recently, the sad news reached us that two of these mines were likely to be closed, after yielding untold wealth for nearly two centuries, the cost of working the deposits of tin and copper being now greater than the profits to be earned. If these mines closed they would throw out of occupation and livelihood more than four thousand people—men, women, and children—engaged therein.

The celebrated Botallack Mine is situate in the Parish of St. Just, about two miles from the town of that name, about the same distance from Cape Cornwall, seven miles from the Borough of Penzance, and about the same distance from the Land's End. Levant Mine is also near to Botallack, and, like that mine, is close to the sea. This one, however, is still working well, and rich. Botallack is in itself worth seeing, even if no mine existed in its

recesses. It is a bold headland composed of huge masses of hornblende, marked by walls of slate, against which the Atlantic surges are continually dashing. But the persevering efforts of man have at this point been more-powerful than those of nature. Here is to be seen the most striking example of man's boldness in the search of [312] wealth, and his skill in securing it. Gloomy precipices of slate which unnumbered ages of sea-storms have been unable to displace are here cut in twain by the miner, whose complicated machinery clings to the cliffs at places where it would seem almost impossible for an engine to be fixed. The spectator here finds himself at once in the midst of a busy community. Powerful steam-engines, a stamping-mill, and all the heavy machinery required in modern mining are perched on what at first sight seem inaccessible situations, so that from a distance they look as if growing out of the crags. All is noise and bustle, which contrast strangely with the placidity of the seaward view in calm weather. "Kibbles"¹⁰⁴¹ descend fathoms beneath the sea through the shafts, and ascend again laden with tin- or copper-ore, which is wheeled away to larger heaps, where women, boys, and girls pick and separate the various qualities with the systematic industry of workers in a factory. Everybody and everything—rocks, platforms, and paths—are smeared with the prevailing red hue, derived from a slight mixture of iron with the ore; and the muddy stream flowing from the stamping-mill to the sea has imparted to the beach, the breakers, and the foam the same ruddy tinge. If ore is coming up plentifully and of good quality everybody is

1041 WC: Large buckets.

pleased, and far down in the gloomy depths of the mine, which Cornish legends people with sprites and gnomes, the news that a new "bunch" (vein or mass) of copper has been struck, or that the old lode is growing richer, fills the workers with professional joy. As the visitor creeps along the underground passages, into which the light of day has never entered, he hears comparatively little. Having become accustomed to the darkness, barely illumined by the flicker of lamps, he dimly distinguishes the stalwart miners at work. Coming down from the upper world amid the incessant din of heavy stamps, the measured gush of pumps, the clang of machinery above and the surge of the sea below, the rattle of wagons on tram-ways, and the crowds of men and boys climbing up and down paths which seem too steep for a goat, the modified silence of the deep underground levels strikes one as unnatural. In places, however, the guides may ask the visitor to listen to a curious sound. It is the booming of the waves overhead, and the grating of the stones on the sea-bottom. Then he is told, to give him courage, that in some of the recesses of the first level the ore has been cut away until a roof not more than 6 ft. or 8 ft. thick has been left. First worked on the face of the cliff only, the mines descended level by level until the excavations extended for more than 600 [313] fathoms under the sea, and for long distances inland, while the greatest depth to which it had been sunk was about 2,000 ft. It was this persevering search after ore which gave Botallack its celebrity, and that brought it streams of more or less distinguished visitors.

The Queen, with Prince Albert, visited this mine in 1846, to see what her Cornish subjects could accomplish, and

Her Majesty also bravely descended a considerable distance into the mine by the common miner's way through the diagonal shaft, a kind of narrow subterranean gully or tunnel. And again, in 1865, the Botallack miners kept holiday in honour of a visit from their Duke and Duchess, whom we know more commonly as the Prince and Princess of Wales. The Duchy of Cornwall was created in 1337 for Edward the Black Prince, who became entitled to the revenues from the manors, and also the tin dues.

I may here quote, for your information, a portion of a graphic description of a visit to one of the submarine mines in St. Just during a storm: "At the extremity of the level seaward, about 100 fathoms from the shore, little could be heard of its effects, except at intervals, when the reflux of some unusually large wave projected a large pebble or boulder outward, bounding and rolling over the rocky bottom. But when standing beneath the base of the cliff, and in that part of the mine where but 9 ft. of rock stood overhead between us and the ocean, the heavy roll of the larger boulders, the ceaseless grinding of the pebbles, the fierce thundering of the billows, with the crackling and boiling as they rebounded, placed a tempest in its most appalling form too vividly before me to be ever forgotten. More than once, doubting the protection of our rocky shield, we retreated in affright; and it was only after repeated trials that we had confidence to pursue our investigations."

The deeper workings, having a natural temperature of 70° to 80° Fahr., in some places rising to 85° or 90°, tax the ingenuity of the mine captains to introduce a sufficient

ventilation; but the arrangement of numerous shafts with abundance of communication by winzes between the levels have enabled them so far to triumph over difficulties that, in several examples, we may point to a great complication of workings satisfactorily ventilated without furnaces or mechanical appliances, and yet carried out through hundreds of fathoms of excavation.

Mining is so ancient an art in Cornwall that it is often difficult to trace the beginning of any particular working in that county. It must, indeed, have often happened that openings now excavated deep in the earth, or, like Botallack and Levant, far under the sea, had their beginnings in the [314] rude washing of the surface alluvium known as "tin-streaming." This was the method adopted by the ancient miners for obtaining the metal which they sold to the Phœnician merchants. At all events, close to Bunny Cliffs, a little south of the present mine, there are some "old men's workings," as the remains of what are taken to be ancient surface streaming of the prehistoric races are called. As early as 1721 Botallack was wrought as a tin-mine, on the method which, with modifications suggested by modern discoveries, has been followed ever since. By 1841 it was famous as a very rich copper-mine, a reputation which it may be hoped it will some day recover, though until recently it was notable for both of these metals, or for whichever exploration brought to light in greater abundance. Since 1862 the more picturesque aspects have suffered by its being wrought more economically, and with greater sanitary efficiency, by the Boscowen shaft, which runs from near the water's edge in an oblique direction under the sea. This diagonal shaft is

400 fathoms long, and cost about £4,000. A difficulty not much less than that of sinking the tunnel, which is descended by wagons, was that of lowering the engine to its position. The Crown engine had been lowered to its exposed situation on the Crown Rocks over a cliff 200 ft. high. When, however, the 24 in. cylinder engine was first dropped on its wild exposure, over the face of a rugged precipice, it was never expected that it would undergo a second migration. But in 1863 the huge boiler and beams were, after being drawn to the top, again relowered to a new resting-place, and a house built for their reception.

It is therefore not without good ground that Cornishmen claim Botallack as one of the world's wonders. Apart from the place it must always occupy in the history of mining engineering, it will be a distinct loss to Cornwall that so extensive a concern is likely to be closed, either permanently or until times mend. But mines are at best among the most fickle of fortune's gifts, and the enormous imports of foreign tin and copper are, undoubtedly, not to the profit of the more expensively worked native mines.

As an instance of the uncertainty in tin-mining, I may relate a well-known circumstance that took place in Botallack Mine. After expending nearly £20,000 the prospect of a return seemed hopeless, as the resident agent declared to the proprietors, at their meeting in November, 1841, that "he knew not where to find twopennyworth of ore in all the mine." Several of them were therefore strongly inclined to abandon the concern, but it was eventually determined to continue it for a further period of two months, with a resolution to give up

the whole in case of no improvement in that period. It afterwards appeared that, when they were, thus discussing the [315] propriety of abandoning the concern, the workmen were within 2 in. or 3 in. of a “bunch” of copper-ore, which in twelve months yielded a profit of £24,000.

From published reports I gather that the profit on the working of Botallack from 1836 to 1865 was £102,150 in actual dividends, and on Levant, from 1830 to 1865, was upwards of £200,000.

Botallack Mine had been for some time past worked at a heavy loss. It is composed of seventeen hundred shares, and the shareholders not long ago had been called on for £1 10s. a share. This call was met; but, notwithstanding, the mine was still being worked at a great loss, the return of tin being scanty and inferior in quality, so that the directors had no desire to make another call. Lately fifty men had been discharged, but these fortunately found employ at Levant Mine, near by; and there were still 130 men and forty-four boys employed on the mine, but all working at much lower wages. There were also upwards of five hundred children dependent on the miners of this one mine. At the last adjourned meeting of the shareholders it was decided to offer the mine, with all its extensive machinery, for sale, or, failing that, to shut it up, which means a heavy blow for West Cornwall.

Having shown on a small summary scale the digging and raising of the ore from deep in the bowels of the earth to its surface, I may also briefly relate a few interesting items that follow concerning its preparation for the

market, having not infrequently witnessed them all with much delight in my youth :—

(1.) The ore as it comes from the mine is taken to the stamping-mill. This mill is composed of upright beams of squared timber several feet in length, and, say, 8 in. or 9 in. in diameter, each piece being strongly shod, or armed, at its lower end with a heavy iron stamp or pestle. These posts or beams are set up vertically close together in a row, and are raised continually by water-power, and when set working soon pulverise the mass of ore below. Water is continually let in, and the stones, earth, and sand, reduced to small particles, are carried off with the tin into sloping pits and courses prepared to receive them. The tin being the heaviest sinks early, and is soon detained. This is taken up and “dressed”—that is, put into proper heaps on flat earthen floors specially prepared for its reception, where it is in due time “ticketed,” or assorted, according to its purity and value.

(2.) All things being ready, the tin (in grains or sands) is put up into strong, long, narrow sacks and carried off on mules to the tin-smelting house, of which there were two in the west of Cornwall, one being at Stable-Hobba, a village [316] about a mile and a half to the west of Penzance, between Treneipe and Newlyn, and one at Chyandour, a village a little to the east of Penzance, and almost a suburb of it. Those sacks of tin were often carried on mules from the mines through Penzance to the smelting-house at Chyandour, and to me it was always a gladdening sight to see the drove of twenty or more mules coming steadily along in pairs, keeping step in due marching order, and bearing their heavy burdens,

following the man in charge, who preceded them on horseback, their red-looking sacks of tin appearing so uniform, each sack (of which there were generally three on a mule) containing about 1 cwt.

(3.) Arrived at the smelting-house, the raw tin was melted down in large furnaces and run into regular-shaped moulds cut in granite, each block forming a parallelogram of about 2 ft. long by 1 ft. broad on the surface and 6 in. to 9 in. deep, and narrowed on all sides and on the base below, its upper surface shining brilliantly.

(4.) The next step in the process would be to carry these blocks of pure tin metal into Penzance (as one of the "coinage towns") to the "coinage-hall" there, in order to their being duly coined by the officers of the Duchy. This was done—(a) By weighing them separately and infixing the weight in the face of the block; (b) by stamping each block with the arms of the Duchy; (c) by clipping off a small piece (an ounce or two) from one of the corners: and now it was ready for sale, use, or exportation.

(5.) But there was still another tin-melting house, or premises, near the quay at Penzance, where those blocks of tin were (when required) again melted down and made into small tin bars or rods. This was a peculiar and pleasing process, which I will briefly describe: An open furnace, or big melting-pot, into which one of those blocks of tin was placed, being suspended on a large iron hook. Around the building, against the walls, was a row of thick flat-surfaced grey-marble slabs, each about 4 ft. long by 2 ft. wide, cramped around with iron. In the face of those slabs were cut across straight, narrow,

semicylindrical grooves, very near each other, about $\frac{3}{4}$ in wide and deep. These were carefully filled with the liquid tin, brought from the furnace in deep short-handled bowl-ladles, and poured into the grooves, which soon became solid and cooled, and were dexterously picked out singly by the workman. It was a very interesting sight to see the skilful and experienced workman pour quickly into each groove sufficient metal to fill it from his heavy ladle held by both hands, and then to pick up rapidly the shining tiny bars, still very hot, into his left hand well armed with thick woollen rags. These bars were then stacked crosswise, and looked [317] very pretty. Sometimes, but rarely, there would be a short or imperfect one, which, of course, would be again consigned to the melting-pot. I understood, that those small tin bars were exported in that state to the West Indies and other countries as an article of commerce.

I would also remark on the peculiar appearance of the tin-smelting houses, owing to their several very high and narrow telescope-shaped brick chimneys, regularly cramped and banded with iron throughout to the top, one, of course, to each furnace. On a dark night the bluish flame that rises in the still air from the top of each chimney has a very singular look, somewhat weirdlike, and must often seem strange to the visitor or traveller by night not knowing the cause, particularly the smelting-house at Chyandour, from the fact of it being situate in a low valley close to the foot of a high range of thickly wooded hills, the dark foliage of the trees in the immediate background serving to enhance the romantic appearance of the tremulous and coloured flames of fire.

Moreover, I believe those smelting-houses are often, if not generally, worked in by night.

I have said that Penzance is one of the “coinage towns” of the Duchy of Cornwall. This I will further explain. In Cornwall at present there are five coinage towns—viz., Launceston, Lostwithiel, Truro, Helston, and Penzance. These are termed in law “stannary towns,” and have certain peculiar laws and privileges respecting mines and miners; and all tin raised in the county must be taken to one of them in order to it being stamped and the dues paid. The infancy of the stannaries, with which the history of the Courts is almost inseparably interwoven, is obscured by the “purple haze of antiquity.” Gilbert, in his “Historical Survey of the County of Cornwall,” observes that the “hand of time, united with the loss of the first charter and the destruction of many stannary records at Lostwithiel in the unnatural times of Charles I., have thrown an air of obscurity, doubt, and uncertainty on the stannary laws which it would now be a difficult, if not impossible, task to remove.” There is a consensus of opinion that the word “stannaries” is derived from the Latin stannum = tin, but it is believed by some it comes from stean, the old Cornish word for tin. It would seem that the formation of Stannary Courts followed hard upon one of the recurrent periods, of activity in the production of tin a century or two after the Norman invasion. The tin-mines of Cornwall were not very productive in the reign of John. That king was Earl of Cornwall, and according to one or two historians he bestowed some valuable privileges on the county—relieved it from the operations of the arbitrary forest laws, and granted a charter to the tanners. A still more favourable [318]

charter was granted to them by Edward I., under which the miners were exempt from all jurisdiction except that of the Stannary Courts, save in cases affecting land, life, and limb. The tanners agreed to pay to the grantor $\frac{1}{2}$ d. on every pound weight of wrought ore. Then, the labouring tanner who might discover tin in waste or uncultivated lands became entitled to a certain interest in such land upon giving proper notice in the Stannary Court to its proprietor. The laws and privileges of the Cornish mines were further enlarged in the reign of Edward III., and subsequent Acts passed during the sovereignty of Richard II. and Edward IV. confirmed them. Blackstone says, "The Stannary Courts of Devonshire and Cornwall for the administration of justice among the tanners therein are also Courts of record." These records, which exist in great numbers among the rolls of the Exchequer, record the usage of five centuries. The Stannary Parliament in Cornwall, which enacted laws for the government of the stannaries, consisted of twenty-four members. This Assembly elected its Speaker and proceeded regularly with its business when meetings were necessary. It was also known by the name of "Convocation." Tonkin asserts that the charter of Henry VII. first regularly established the Cornish Convocation.

Camden, in his "Britannia," writing on the Cornish mines, says, "After the coming-in of the Normans the Earls of Cornwall had vast revenues from those mines, especially Richard, brother to Henry III. And no wonder, when Europe was not supplied with tin from any other place, for, as for the mines in Spain, the incursions of the Moors had shut them up; and the veins of tin in Germany were not then discovered, nor opened before the year of

Christ 1240, at which time (as a writer of that age has it) ‘the metal called tin was found in Germany (by a certain Cornishman who was banished his country) to the great damage of Richard, Earl of Cornwall.’” Further, Camden says, “The Dukes of Cornwall, according to ancient custom, are to have forty shillings as tribute for every thousand pounds of tin; and it is provided that whatever tin is made it shall be carried to one of the four [now five] towns appointed for that purpose, where, twice every year, it is weighed and stamped and the impost paid; and before that no man may sell or convey it away without being liable to a severe fine” (*l.c.*, vol. i., pp. 143, 145).

Referring to the historical fact of the Phœnicians trading for tin with the ancient Britons, already intimated, I may also bring before you what the early historians have left on record concerning this primitive commercial transaction. The first notice is by the celebrated Greek historian Herodotus, who lived 450 years B.C., and who has been justly termed “the [319] Father of History.” In writing of the natural productions of Europe he says, “Of that part of Europe nearest to the west I am not able to speak with decision. Neither am I better acquainted with the islands called the Cassiterides, from which we are said to have our tin. I have endeavoured, but without success, to meet with some one who, from ocular observation, might describe to me the sea which lies in that part of Europe. It is nevertheless certain that both our tin and our amber are brought from those extreme regions” (*lib. iii., “Thalia,” ch. cxv.*) Scanty as this information is, yet you will have noticed its charming careful simplicity, which is also the more pleasing seeing

that of late years much of what Herodotus had written concerning little-known and distant countries, and which had been called in question, has since proved to be in the main correct.

The second notice is by the historian Diodorus Siculus, who flourished about 50 B.C. Diodorus says, "The Britons who lived in those parts, digging tin out of a rocky sort of ground, carried it in carts at low water to certain neighbouring islands, and thence the merchants transported it into Gaul"; and, again, he pleasingly observes, "The inhabitants thereof, by conversation with merchants trading thither for tin, became remarkably courteous to strangers." Here I may also fittingly quote a nice observation respecting our Mother-country made at a very early date by another historian, Dionysius of Halicarnassus, who was famed for his caution and fidelity in his histories, and who lived about 30 B.C. Dionysius, in his "Periegesis," says "that no other islands whatever can claim equality with those of Britain."

The third record concerning Britain and its tin is found in the work of the celebrated Roman geographer Strabo, who flourished in the age of Augustus and Tiberius, and who died in the year 25 A.D. Strabo says, "The Cassiterides (from the Greek word *kassiteros* = tin) are ten in number, lying near each other in the Atlantic Ocean, towards the north from the haven of the Artabri"¹⁰⁴² (lib. iii.).

The fourth mention of the subject is by the great Roman historian and naturalist Pliny, who lived in the first

1042 WC: Lusitania and Cape Finisterre.

century of our Christian era, and who lost his life in that terrible eruption of Vesuvius that destroyed the towns of Herculaneum and Pompeii, on the 24th August, 79 A.D., while too closely and fearlessly engaged in investigating that grand phenomenon of nature, as is graphically written by his nephew, Pliny the Younger, his letters describing it to his friend Tacitus, the historian. Pliny, the elder, writes,

Opposite to this coast is the island called Britannia, so [320] celebrated in the records of Greece and of our own country. It is situated in the north-west, and, with a large tract of intervening sea, lies opposite to Germany, Gaul, and Spain, by far the greater part of Europe. Its former name was Albion, but at a later period all the islands, of which we shall just now briefly make mention, were included under the name of Britanniæ. ... Timæus,¹⁰⁴³ the historian, says that an island called Mictis is within six days' sail of Britanniæ, in which white-lead¹⁰⁴⁴ is found, and that the Britons sail over to it in boats of osier covered with sewed hides" (*lib. iv.*, ch. xxx.). Further on Pliny writes, "Midacritus was the first who brought tin from the island called Cassiteris. ... Danais was the first who passed over in a ship from Egypt to Greece. Before his time they used to sail on rafts. Even at the present day they are made in the British Ocean of wicker-work covered with hides" (*lib. vii.*, ch. lvii.).

1043 WC: Timæus, an historian of Sicily, who flourished 262 b.c.
All his works are lost.

1044 WC: White-lead = *Plumbum album*; the Latin word stannum denoted originally a compound of silver and lead, and was not used to denote tin until the fourth century.

There appears some confusion here in the geography, which is not to be wondered at, for the Greek and Roman geographers, borrowing their knowledge from the Phœnician merchants, seem to have a very indistinct notion of the precise locality of those islands. It is not unlikely that Cornwall itself, or a part of it, or even small islands then existing in Mount's Bay and elsewhere, is meant, particularly in the relation of Timæus, and also in that of Diodorus; even St. Michael's Mount, in Mount's Bay (now and for some time past a shipping port with a quay), has been by some modern writers supposed to be the island referred to, whence the tin was taken by the Britons in carts, that island being easily accessible for carts, &c., at low water and at half-tides. There is an old tradition there in the west of Cornwall that a large portion of the south-west coast in Mount's Bay, &c., was early submerged and lost in a grand inroad of the ocean. A portion of the bay near the west side, about a mile from the shore, where ships frequently anchor, is always called "the Lake," and "Gwavas Lake," and I myself have seen, on the low flat sandy beach near Marazion and the Mount, at low water (the tide receding largely there), many upright stumps of large trees imbedded in the sand and mud.

Camden has some statements and observations on this particular subject, and I may again briefly quote from him. He says, "The inhabitants of the west end of Cornwall are of opinion that the promontory of the Land's End did once reach farther to the west. The neighbours will tell you, [321] from a certain old tradition, that the land then drowned by the incursion of the sea was called 'Lionesse.'" Here follow several

reasons, or “hints,” as Camden calls them, “contributing something of probability”; and he closes with the following remark: “To these we may add a tradition that, at the time of the inundation supposed here, Trevelyan swam from thence, and in memory thereof bears gules an horse argent issuing out of the sea proper” (*l.c.*, p. 148). This last remark is a very suitable one for Camden to make, he being Clarencieux King-at-Arms. I have myself heard of the tract of land overflowed by the sea being called Lionesse, and also know of large portions of land extending along the shore in the western part of the bay, once covered with delightful green turf (on which I had often walked and played), being entirely carried away by the sea.

I have mentioned a modern belief that St. Michael’s Mount is (at least) one of the places in Britain anciently resorted to by the Phoenicians for tin, but I do not agree therewith. No doubt it has at present a kind of raised flat and broad beach, or natural causeway, connecting it with the mainland, passable for carts, &c., at and near low water, but whether such existed in those ancient times is highly questionable. And this, moreover, is largely supported by the Cornish name of the mount (Carregluzenkuz = “the hoar-rock in the wood”), and we know from our own ancient history that Cornwall was largely disforested in the reign of King John. William of Worcester records a tradition that “St. Michael’s Mount was originally enclosed with a very thick wood, distant six miles from the ocean.” The ancient Britons, workers of and traders in tin, must have had a long way to bring their heavy metal ore to such a mart or port, seeing that all old ancient workings have been found at a great

distance from the mount. I should rather incline to believe that the Looe Pool, in Mount's Bay (only a few miles east from the mount), was then both open (without its bar of sand at its mouth) and, with the Cober River at its head, formed more of a harbour than it is at present, and quite sufficient for the light Phœnician vessels; and that Helford River and Harbour, on the east side of the Lizard Promontory (its head-waters at Gweek being only a short distance—three or four miles—across the same from the Looe Pool), was also another port visited by the Phœnicians. There are good antiquarian reasons for believing this, some of which I will briefly mention: (1.) Many ancient stream-tin workings have been discovered at and around those two places, with the rude implements then used in the extraction and dressing of tin. (2.) Various foreign remains have also been found there, as urns, coins, beads, &c., of Roman and other nations; and [322] on the Helford River are the ruins of large Roman encampments and towns. (3.) The ancient name of that country—the Lizard Promontory—is a very peculiar one—*Meneâge*, said to have been given to it by the Phœnicians, and to mean, in their language, a low heath-like plant with which that district abounds.¹⁰⁴⁵ Certain it is that the name is not English, nor Cornish, nor Norman-French, nor Saxon, and it is still the common and legal name of the whole district; while several other names of places around the coast are also of foreign origin—some are said to be Persian. (4.) The principal tin, or “coinage,” town in Cornwall, according to ancient

1045 WC: *Erica vagans* = Cornish heath, a highly ornamental little shrub, often grown in gardens, and only found here in Britain; is a native also of the south of Europe.

English laws and charters, was Helston, which town is only a short distance from the Cober River.

I have said that Cornwall is rocky, and that granite is the chief stone; but there are many other stones and minerals to be found. The granite which forms the great bulk of the westernmost portion of the peninsula is succeeded by a series of very curious stratified rocks, which are generally slaty, but in certain bands assume the characters of a hornblende schist, of serpentinous rock, or of singular alternations of folia, in which garnet and its massive variety—allochroite, axinite, chlorite, and other silicates—play a prominent part. It is these variously coloured and angular, or even jagged, rocks that lend so wild and picturesque a character to the whole range of coast from Cape Cornwall to Pendeen Point, which includes Botallack and Levant; and again we meet these same stratified and ambiguous masses when, after descending through the deep shafts hewn out of the solid granite, we enter the levels or galleries which have opened the way under the western ocean; and, at smaller or greater distances, according to the depth, encounter them again, extending to the farthest points, some half a mile from the shore, which have yet been attained.

The lodes or mineral veins themselves are notable for their deviation from the directions which are usual elsewhere in the west of England. They may be seen especially in Levant and Botallack Mines, as well as in others near. They have a tendency to strike north-west and south-east; at the same time they are intersected by cross-veins (the guides of the miners). Some of these veins are narrow strings, but running—a number of

them—parallel, in a width of from 10 ft. to 20 ft., through a somewhat friable granite. The ordinary lodes are from 1 ft. to 3 ft. in breadth, though in Botallack and Levant they have been much larger. As [323] usual, they are often made up of quartz, and commonly in a number of successive crystalline plates or combs; but even here they often exhibit charming little crystals of dolomite, of specular iron-ore, of göthite, or of manganese spar. Tin-ore (cassiterite) is the substance which has most largely contributed to the wealth of this district; occurring principally where the lodes occur in the granite rock, it has been followed down from the open “coffins”¹⁰⁴⁶ of our remote Cornish ancestors to a depth of 300 fathoms (1,800 ft.) from the surface.

While, however, certain of the veins, as the north lode of Levant (and those of Huel Cock, a mine adjacent), carry a good deal of yellow copper-ore along with iron and arsenical pyrites, enormous wealth has been obtained from the courses of vitreous copper-ore, the sulphide-of-copper glance, which, especially in Botallack and Levant, extended for a great length under the sea, and which ore was more or less continuous down to a depth of almost 200 fathoms. The occasional occurrence of native bismuth, of cobalt-ores, of silver, and the rare and costly ores of uranium, add much interest to the mineralogical contents of these lodes.

Dolcoath Mine is mentioned at the beginning of my paper. This mine is situated near Camborne, and has long been the premier mine in Cornwall. However, after several years of continued unexampled prosperity, the

1046 WC: Miners’ term for the surface streaming-pits.

mine is now worked only at a great loss, the loss on the last three months being nearly £6,000 (the total expenditure for the last quarter being nearly £20,000), with no prospect of doing better without a fresh and large outlay required to sink a new perpendicular shaft that would cost from £3,000 to £4,000, and take two years to complete, which is absolutely necessary. Tin-ore is plentiful in the mine, which is still rich, but only found at great depths, some of the levels being 364 and 425 fathoms. To abandon the mine would mean great and absolute want for many hundreds of the population. One of the obstacles was the heavy amount of lords' dues, which should have been levied on a more equitable and sliding scale; while another was the unwillingness of the adventurers (or shareholders, many of whom lived in London) to respond to a call for a very heavy outlay—a capital of £90,000 being required. A third hindrance was the very low price of tin in the market, mainly owing to the large quantity of that metal imported from the Straits, where it is also plentiful, and can be worked cheaply. However, after several meetings of the shareholders matters seem to be in a fair way of arrangement, by forming the mine into a limited liability company of 300,000 shares, and by the [324] lords' dues being more equitably assessed according to the profits. It is only by the hearty co-operation of all parties—lords (owners of the soil), adventurers, and working miners—that the industry can be carried on, which will now be done for the first time in mining in Cornwall under a limited liability company.

In writing this paper for you I have culled from a few available sources, works both old and new—from

Camden's "Britannia" (a ponderous folio first published in 1586, and the fourth and corrected edition in 1722), a veritable literary mine of learning, to sundry small serials of the present year—in order the better to support my own views and observations, made more than half a century ago, with undoubted modern authorities, and by so doing make my paper the more varied and generally interesting.
