Cockayne Memorial Paper No. 2.

The Genus *Aciphylla*

By W. R. B. Oliver

[*Received by the Editor, December 5, 1955.*]

Aciphylla is one of the most remarkable genera of plants in New Zealand. It consists of heavily armed herbaceous plants. The flowers are arranged in compound umbels on a central stem, usually in the form of a spike-like panicle, the larger ones attaining a height of over ten feet. The leaves are arranged in a rosette at the base with all the leaflets ending in stiff spines and pointing outwards, thus presenting an impenetrable front against herbivorous animals. There are now no indigenous animals against which the spines would afford protection. It has been suggested, however, that these plants were armed against the moas which formerly roamed the country. This explanation is not convincing. More probably the spine-like leaflets are xerophytic adaptations to dry climatic conditions either on the eastern South Island lowlands or on the mountains where the species of this genus are mostly found. Under European conditions *Aciphylla* plants gradually die out because stock eat them in their young state before the leaves become hard and spiny. In the mountains rabbits are said to eat them and to cause their numbers to decrease.

The genus has not been studied closely by botanists. This may be due in part to the difficulty of collecting specimens which usually draw blood when attempts are made to gather them. Consequently specimens of the larger species showing full-sized leaves and flower heads are seldom found in herbaria, and in any case specimens not poisoned are usually destroyed by insects.

The first species of *Aciphylla* to be collected by botanists was *A. squarrosa* which was obtained at Queen Charlotte Sound by J. R. and G. Forster, naturalists to Cook's second voyage, in 1773 It was described and figured by these botanists in their "Characteres Genera Plantarum" in 1776, both the generic and specific names being there introduced. J. D. Hooker in the "Flora Novae-Zelandiae," 1853, described *A. squarrosa* var. *latifolia (colensoi)* and in the second volume, 1855, added *A. monroi.* In the "Handbook of the New Zealand Flora," 1864, he described *A. colensoi, A. lyallii* and *A. dobsoni.* Mueller in his "Vegetation of the Chatham Islands," 1864, described *Gingidium traversii,* a handsome species peculiar to that island. The collection and description of the species of *Aciphylla* was then taken up by resident botanists in the following order: J. B. Armstrong, J. Buchanan, T. Kirk, D. Petrie, T. F. Cheeseman, L. Cockayne and H. H. Allan. In the present paper I have found it necessary to describe eleven new species.

Distribution

Of the 39 species of *Aciphylla* here recognised, 38 are confined to New Zealand; the remaining one, *A. simplicifolia,* is Australian. In New Zealand only *A. subflabellata* and *A. squarrosa* on the main islands and *A. traversii* in the Chatham Islands grow at sea level. All the remaining New Zealand species as well as the Australian *A. simplicifolia* are plants of the mountains, some ascending to 7,000 feet altitude. All species live on open country: grassland, low scrub, and open alpine situations such as cushion plant formations and rocks.

The Australian species *A. simplicifolia* is nearest related to the New Zealand species *A. townsoni,* an advanced type. Concerning this relationship see under the species. It may therefore be derived from a form which somehow migrated from

A

New Zealand to Australia, or it may be the descendant of some early Tertiary species common to these two countries when they were joined by land. An early Tertiary fossil from Wangapeka was named and figured by Hector (Outlines Geol. N.Z., 61, 1886) as *Aciphylla pungens,* but the illustration looks much more like a spine of *Discaria.*

Classification

The type species of the genus *Aciphylla* is *A. squarrosa* Forst., Char. Gen. Pl., p. 136, Pl. 68, 1776, the specimens on which both genus and species were founded being obtained at Queen Charlotte Sound. *A. squarrosa* is typical of most of the species of the genus, having specialised stipules, 2–3-pinnate leaves with hard sharp-pointed leaflets and the flowers arranged in compound umbels on stout stems. *Aciphylla* is approached closely by the genus *Anisotome.* On the whole the species of *Aciphylla* are heavily spinous, the leaflets always being linear and sharp pointed. But the character which I have relied on to separate *Aciphylla* from *Anisotome* is the presence (with the exception of the species *simplex* and *simplicifolia*) in *Aciphylla* of leaf-like stipules, either similar in width to the leaflets or modified into shorter and narrower leaf-life organs. In *Anisotome* the sheaths end in rounded membranous lobes. The nomenclature of the different parts of the leaf has varied with different authors. In the present paper I apply the term stipules to the lateral organs at the top of the sheath whether they be similar to the leaflets or shorter and narrower. The succeeding section of the rachis to the lowest pair of pinnae is the petiole. If the stipule is differentiated from the leaflets the terms 3–5–7-foliolate do not include the stipules, but if the stipules are similar to the leaflets then the terms 3–5–7-foliolate include the stipules. Only in *A. simplex* and *A. simplicifolia* is there no organ that could be called a stipule either a leaf-like or a specialised one. The nature of the stipules is an important character for the classification of the genus.

Synopsis of Species of Aciphylla

I. No stipules. See also Section IV. *A. simplicifolia.* Leaf simple. Inflorescence globose — *A simplex*

II. Stipules leaf-like, simple. Leaflets, including stipules, 3–7
- Inflorence globose
  - Leaves hard, conspicuously reticulate
    - Leaflets (incl. stip.) 3
      - Small — *A. leighi*
      - Larger — *A. dobsoni*
    - Leaflets (incl. stip.) 5–7 — *A. crosbysmithii*
  - Leaves soft, striate. Leaflets (incl. stip.) 5–7
    - Flabellate — *A. spedeni*
    - With short petiole — *A. congesta*
- Inflorescence elongate, female shorter and more dense than male
  - Leaves 1–3-foliolate (5-fol. in var. *cartilaginea* of *A. traillii*) Bract sheaths short, broad
    - Leaflets narrow, 3–4 mm — *A. traillii*
    - Leaflets broad, 8–12 mm — *A. kirkii*
  - Leaves 3–5-foliolate
    - Bract sheaths short, broad — *A. hectori*
    - Bract sheaths long, narrow — *A. verticillata*
  - Leaves 7-foliolate Bract sheaths short, broad — *A. flexuosa*

III. Leaflets and stipules pinnatifid — *A. pinnatifida*

IV. Stipules (absent in *A. simplicifolia*) modified into small leaflets or acicular organs. Small plants, mostly with weak stems.
- (a) Inflorescence more or less globose
  - Leaves pinnate
    - Leaves small, to 6 cm, leaflets narrow, 10 x 1 mm. Female heads short, bracts narrow. Leaf sheaths longer than petiole — ***A. polita***
    - Leaves larger, to 12 cm, leaflets narrow, 35 x 3 mm. Female heads short, on long stems, bracts narrow. Leaf sheaths longer than petiole — ***A. monroi***

Leaves large, to 27 cm, leaflets broad, 60 x 4 mm. Female head large oblong, bracts broad. Leaf sheaths about as long as petiole — *A. similis*
Leaves 2–3-pinnate
Leaves bipinnate, leaflets 1½–3 mm wide. Inflorescence oblong — *A. divisa*
Leaves 2–3-pinnate, leaflets 1–1½ mm wide. Inflorescence globose
Leaflets rigid, long, 6–7 pairs, stipules simple — *A. multisecta*
Leaflets soft, short, 9–10 pairs, stipules simple or trifoliolate — *A. dissecta*

(b) Inflorescence elongate
Leaves tripinnate. Leaflets short, dagger-like, margins serrulate — *A. hookeri*
Leaves simple or pinnate. Leaflets hard, linear, margins smooth
Leaves simple or pinnate, leaflets 3–6 mm wide. Male inflorescence compact — *A. lyallii*
Leaves pinnate, leaflets 1–2 mm wide. Male inflorescence lax — *A. gracilis*
Leaves 1–2-pinnate, grassy, linear, margins serrulate (smooth in *A. simplicifolia*)
Leaves pinnate (sometimes 2-pinnate in *A. townsoni*)
Bract leaflets broad — *A. trifoliolata*
Bract leaflets narrow
Leaves broad, 5 mm — *A. crenulata*
Leaves narrow, 2 mm
Leaves pinnate (sometimes 2-pinnate) — *A. townsoni*
Leaves simple (margins smooth) — *A. simplicifolia*
Leaves 2-pinnate — *A. indurata*

V. Large plants with stout, erect stems and large elongate panicles. Leaves rigid (rather flaccid in *A. glaucescens*)

(a) Leaflets narrow, 3–5 mm wide
Leaf margins serrulate
Leaves rigid, 2–3-pinnate
Bract terminal segment turned down
Leaves short, subflabellate, 2-pinnate — *A. subflabellata*
Leaves long, spreading, 3-pinnate — *A. squarrosa*
Bracts not turned down. Leaves short, 2-pinnate — *A. takahea*
Leaves flaccid, 3-pinnate — *A. glaucescens*
Leaf margins smooth
Leaves 3-pinnate — *A. intermedia*
Leaves 2-pinnate — *A. inermis*

(b) Leaflets of medium width, 7–16 mm
Leaves pinnate, margins smooth or minutely serrulate
Leaflets jointed — *A. traversii*
Leaflets not jointed — *A. latibracteata*
Leaves 2-pinnate, margins serrulate
Stipules long, narrow, leaflike. Bract sheaths narrow — *A. aurea*
Stipules short. Bract sheaths broad
Midrib prominent — *A. colensoi*
Midrib not prominent — *A. scott-thomsoni*

(c) Leaflets broad, 20–30 mm wide. Leaves pinnate
Stipules short; bract sheath long; bract leaflets narrow — *A. ferox*
Stipules long; bract sheath short; bract leaflets broad — *A. horrida*

In the following account, under the heading Distribution, the abbreviations used are: AM, Auckland Museum; DM, Dominion Museum; CM, Canterbury Museum; BD, Botany Division, Department of Scientific and Industrial Research.

Aciphylla simplex Petrie, Trans. N.Z. Inst., 22, 440, 1890.

Type from Mt. Cardrona in Dominion Museum (Plate 1, Fig. 2).

This and *A. simplicifolia* are the only species of *Aciphylla* with simple leaves, but in *A. simplex* the condition might be described as primitive, while in *A. simplicifolia* it almost certainly is due to reduction from a pinnate state. The leaf of *A. simplex* consists of a sheath and a tapering blunt-pointed blade, the latter being rather longer than the sheath. There are no stipules. The sheath passes gradually into the blade, the line of junction being clearly marked

between the smooth surface of the sheath and the ribbed surface of the blade. In texture the leaf blade is hard and rigid, with thickened edges and prominent nerves, reticulated in the upper half, and resembles the leaves of its nearest relatives *A. dobsoni* and *A. crosbysmithii*. The inflorescence with its few spreading branches is also similar to those in the same species. The leaves when dry are stiff and brittle, greenish yellow between the yellow veins, and orange on the upper part of the sheath. The plants form cushions up to two feet in diameter and four inches in height.

DISTRIBUTION. Mountains of western and Central Otago, in open situations, 5,000 to 6,000 feet. Mt. Pisa (*Petrie,* DM). Mt. Cardrona (*Petrie,* DM, type; *Wall,* CM). Remarkables (*Speden,* AM, 6548). Hector Mountains (*Speden,* AM, 6545). Cecil Peaks (*Simpson* and *Thomson*). Garvie Mountains (*Speden,* DM; *Mackay,* BD, 60062).

Aciphylla leighi Allan, Trans. Roy. Soc. N.Z., 69, 270, 1939.

Type from Mt. Milne, Darran Range, in Botany Division.

This species is closely allied to *A. dobsoni*. It is described as smaller, leaves less rigid, not pungent and the umbellules scarcely capitate. In the original description of the bracts the phrase "ending in 3 segments with finely acicular tips" should follow the word bracts two lines above. The collector, Mr. D. Leigh, states that the plant forms patches up to six feet in diameter at an altitude of 6,500 feet, beneath the summit rocks of Mt Milne

DISTRIBUTION. Mt. Milne, Darran Range (*Leigh,* BD.).

Aciphylla dobsoni Hooker, Hbk. N.Z. Flora, 93, 1864.

Type from Mt. Dobson, above Lake Tekapo, in Kew Herbarium.

Well marked from all other species, except *A. leighi,* by its short tufted leaves with three equal segments, tall scape and globose inflorescence. The leaf segments are alike, the central one slightly longest. The lateral ones are presumably equivalent to those which, in the more advanced species, are modified into stipules. In texture, colour and venation the leaf segments are precisely like those of *A. simplex* and *A. crosbysmithii*. *A. dobsoni* forms cushions up to two feet in diameter on the summits of the mountains from 5,000 to 7,000 feet.

DISTRIBUTION. Inland mountains of South Canterbury and northern and central Otago. Two Thumb Range (*Wall,* CM). Mt. Dobson (*Dobson* & *Haast,* Kew; *Cheeseman,* AM, 6542). Richmond Range (*Wall,* CM). Mountains above Lake Ohau (*Buchanan,* DM). Mt. St. Bathans (*Petrie,* DM). Near Lake Hawea (*Haast,* CM). Mt. St. Mary (*Wall,* CM). Remarkables (*W. A. Thomson,* AM, 6541).

Aciphylla crosbysmithii Petrie, Trans. N.Z Inst., 47, 48, 1915.

Type from Mt. Cleughearn in Dominion Museum. (Plate 1, Fig. 1.)

Clearly belonging to the group of *A. dobsoni*, this species is considerably larger, and the leaves normally have seven leaflets (sometimes 8 leaflets), including the stipular ones. The leaflets are longer in proportion to their length and not tapering from their bases as in *A. dobsoni* and *A. simplex*. In textures they resemble those of *A. dobsoni* In plants collected on the mountains above Takahe Valley in the Murchison Range the length of the leaves is 14 cm and the scape and panicle 24 cm. The plants form cushions more than two feet across and six inches in height in grassland and scrub above the forest line.

DISTRIBUTION. Western Otago aad Fiordland. Mt. Cleughearn (*J. C. Smith,* AM, 6539; DM). Princess Ra. (*W. A. Thomson,* DM). Takahe Valley (*Oliver*). Mt. Burns (*Speden,* CM). Mountains above Lakes Manapouri and Hauroko (*W. A. Thomson,* DM).

Aciphylla spedeni Cheeseman, Trans. N.Z. Inst., 45, 93, 1913.

Type from Cecil Peaks in Auckland Museum (No. 6536). (Plate 3, Fig. 4.)

A. spedeni and *A. congesta* form a group distinguished by numerous, rather soft, striate, 5–7-foliolate leaves with long sheaths. Stems stout, much taller than the leaves, with globose flower heads. *A. spedeni* differs from *A. congesta* mainly in the very short internodes making the leaf practically flabellate. It is a slightly smaller species with shorter leaves and narrower leaflets The internodes average about 3 mm in length against 15 mm in *A. congesta*. Speden records this species growing on ridges at an elevation of 5,500 feet as plants of a single rosette of leaves or of several rosettes and then forming clumps a foot or more in diameter. Simpson and Thomson state that it is best distingiushed by the greyish green colour of its leaves and the pink-tipped leaf segments.

DISTRIBUTION. Cecil Peaks (*Speden,* AM, 6536). Walter Peak and other places in the Eyre Mountains (*Speden*). Gertrude Saddle, head of Hollyford River (*Moore* and *Cranwell,* BD).

Aciphylla congesta Cheeseman, Trans. N.Z. Inst., 47, 44, 1915.

Type from Mount Balloon, head of Clinton Valley, in Auckland Museum (No. 6529). (Plate 6, Fig. 1.)

Quite similar to *A. spedeni* but with a larger leaf in which the blade is longer than the sheath, whereas in *A spedeni* the sheath is longer than the blade. Internodes four or five times as long as they are in *A. spedeni.* The acicular points at the tips of the leaflets are conspicuous and are similar in both species. The stem is stout, much longer than the leaves, and the main long-stalked compound umbels are generally arranged in a whorl subtended by a whorl of 7-foliolate bracts.

DISTRIBUTION. Western Otago and Fiordland. Mt. Balloon (*Gibbs,* AM, 6529; CM). Mountains above Lake Harris (*Simpson* and *Thomson*). Upper Hollyford River (*Moore* and *Cranwell,* BD). Cleddau Valley (*Simpson* and *Thomson*). Henry Saddle (*Poole,* BD). Matukituki River (BD). Bold Peak (*Aston,* DM). Freeman Pass (*Simpson,* BD). Princess Range (*W. A. Thomson,* DM). Head of Waikaia River (*Hamilton,* DM). Waterfall Creek, Lake Te Anau (*Philipson*). Adams Burn, Lake Te Au (*Philipson*).

Aciphylla traillii Kirk, Trans. N.Z. Inst., 16, 371, 1884.

Type from Mt. Anglem, Stewart Island, in Dominion Museum.

A traillii is distinguished from its allies, having leaf-like stipules and elongate flower heads by its 1–3-foliolate leaves (5-foliolate in var. *cartilaginea*) with long narrow segments with prominent midribs and thickened margins. The male inflorescence is lax, and in the bracts the single leaflet is much longer than the sheath. The female inflorescence is compact, the 3-foliolate laminae of the lower bracts are shorter than the sheaths, while the upper bracts have simple laminae slightly longer than their sheaths.

The variety *cartilaginea* (Petrie) Cheeseman (*A. cartilaginea* Petrie, Trans. N.Z. Inst., 47, 49, 1915. Type from Mt. Rakiahua, Stewart Island, in Dominion Museum) is characterised by broad yellow midribs and much thickened yellow margins to the leaflets. The leaves are 3–5-foliolate. In my opinion it does not differ from *A. traillii* sufficiently to be ranked as a distinct species.

A. traillii is not closely related to any other species, being quite distinct from the other members of the group of *A. hectori* in which I have placed it.

DISTRIBUTION. *A. traillii.* Stewart Island. Mt. Anglem (*Kirk,* DM, type; AM, 6517; *Oliver,* DM). Mt. Rakiahua (*Kirk,* AM, 6516). Var. *cartilaginea.* Stewart Island. Table Hill (*Cranwell,* BD, 24158). Mt. Rakiahua (*Petrie,* DM, type; AM, 6518). Frazer Peaks (*Chapman*).

Aciphylla kirkii Buchanan, Trans. N.Z. Inst., 19, 214, 1887.

Type from Mt. Alta in Otago Museum.

A remarkable species distinguished from all others by its 1–3-foliolate leaves, the leaflets being much longer than the sheaths, approximately equal in length, broad, abruptly acute and of hard texture, with rather prominent veins. The hard thick leaves recall those of *A. crosby-smithii,* but on account of the elongated inflorescence I have associated it with *A. hectori* and *A. flexuosa.*

DISTRIBUTION. Mountains of western and central Otago east of the area of high rainfall. Mt. Alta (*Buchanan,* AM, 6574; DM; OM, type). Wanaka Mountains. (*Simpson* & *Thomson*). Matukituki Basin (*Simpson* & *Thomson*). Near Mt. Aspiring (*Petrie*). Mt. Earnslaw (*Wall,* CM). Remarkables (*Speden,* AM, 6513; *Wall,* CM, DM; *Oliver*). Hector Mountains (*Petrie,* DM; AM, 6515). Garvie Mountains (*Speden,* DM, CM). Old Man Range (*Cockayne,* AM, 475). Mt. Burns (*Speden,* CM). Rock and Pillar Range (*Wall,* CM). Ben Lomond (*Oliver*).

Aciphylla hectori Buchanan, Trans. N.Z. Inst., 14, 346, 1882.

Type from Hectors Col., Mt. Aspiring Range. *A. poppelwelli* Petrie, Trans. N.Z. Inst., 53, 369, 1921. Type from Garvie Mountains in Dominion Museum.

I have been unable to find the type of Buchanan's *A hectori,* but the original description is illustrated by a plate showing both male and female inflorescences. The description and figure fit very well the plant afterwards described as *A. poppelwelli.* (Cheeseman's *A. hectori,* Man. N Z. Fl ; 668, 1925, as I will show under the next species, is quite a different plant as yet unnamed.)

A. hectori is characterised by the 5-foliolate leaves (the stipules here included being leaf-like) and elongate but rather short flower heads. The bract sheaths, especially the upper ones,

are, in the female plant, very short. The leaves of *A. hectori* can be compared with *A. verticillata* but are smaller. The bract sheaths, however, differ very much in the two species, those of *A. hectori* being rather short and broad, whereas in *A. verticillata* they are very long and narrow.

DISTRIBUTION. Mountains of western and central Otago east of the region of high rainfall. Mt. Buster (*Matthews,* AM, 6524). Hector's Col. (*Buchanan,* type). Matukituki River (*Zotov,* BD). Mt. St. Bathans (*Simpson,* BD). Remarkables (*Petrie,* DM). Rough Peaks (BD, 4027). Garvie Mountains (*W. A. Thomson,* BD, 11263; *Poppelwell,* AM, 6525). Mt. Kyeburn (*Matthews,* AM, 6519; *Petrie,* DM; *Aston,* CM). Rock and Pillar Range (*Aston,* DM). Old Man Range (*Speden,* CM).

Aciphylla verticillata n.sp.

Affinis *A. hectori* Buch. a qua differt vaginis bractorum angustioribus, longioribus, inferioribus verticillatis. (Plate 8, Fig. 1.)

Folia 5-foliolata, vaginis angustis, usque ad 85 mm longis; folioli lineari; stipuli foliacei. Caulis robustus, usque ad 20 cm altus. Bracteae inferne verticillatae, vaginis angustis, longis; laminis 3-foliolatis. Femineae umbellae compositae breves, confertae, quam vaginae breviores, usque ad 20 mm longae. Masculae umbellae compositae quam vaginae longiores.

Leaves 5-foliolate (including the leaf-like stipules); sheath long and narrow, with membraneous margins, length up to 85 mm, width at top 8, at base 12 mm; leaflets long and narrow, acute, with a needle-like apex; stipular leaflets up to 115 mm in length; terminal leaflets 90 mm long, 5 mm wide; petiole up to 45 mm long.

Female flowering stem stout, ribbed, 20 cm and over tall, head 20 cm long. Lowest bracts in an irregular whorl, 12 in the type specimen; sheaths long and narrow, 55–60 mm long, width at top 4, at base 8 mm; lamina of three narrow leaflets with acicular tips, length of terminal one up to 80 mm, of lateral 50–60 mm, width 2–2.5 mm Upper bract sheaths much shorter, 35 mm and less in length, terminal leaflets from 60 mm (lower) to 25 mm (upper) in length. Compound umbels short, dense, up to 20 mm long, in the axils of the bract sheaths of which they are much shorter in the lower bracts but longer in the upper ones. A wide space, 70 mm, between the lowest whorl of bracts and the upper ones, which are densely crowded and overlapping. Fruit oblong, ribbed, 5 mm long, with very short calyx teeth.

Male plant, from somewhere in Otago, grown in J. Speden's garden at Gore, so probably not full size. Leaves 3-foliolate, the stipular leaflets not developed, there being a joint only at the top of the sheath. This is usual in young leaves of *Aciphylla.* Length of leaf with sheath 160 mm (sheath 45, petiole 35, lamina 80 mm). Stem to first whorl of 7 bracts 120 mm, head of flowers 155 mm. Lowest bract sheaths 40 mm. Compound umbels rather dense, all longer than the bract sheaths, lowest 60 mm.

Type from Mt. Kyeburn, in Auckland Museum (female No. 6512).

The leaf-like stipules, longer than the terminal leaflets and the elongate inflorescence place this species alongside *A. hectori* and its allies, but it differs from all the other species of the group in the long, narrow bract sheaths, the lowest ones being whorled with a considerable space between them and the bracts above. The leaves most resemble those of *A. hectori,* but are considerably longer.

DISTRIBUTION. Mt. Kyeburn, 4,000ft (*Matthews,* AM. 6512, type). Otago (*Speden,* DM). Between Amuri and Lake Mann (*Allan,* BD). Westland (Mackay, BD, 60482).

Aciphylla flexuosa n.sp.

Affinis *A. hectori* Buch. a qua differt valde majore, foliis 7-foliolatis, segmentis bracteorum latioribus. (Plate 2, Fig. 3.)

Folia 7-foliolata; vaginis sensim deorsum dilatidis, usque ad 75 mm longis; stipulis foliaceis. Caulis quam folia duplo longior. Bracteae vaginis latis, laminis 3–5-foliolatis. Femineae umbellae compositae quam vaginae bracteorum longiores.

Leaves 7-foliolate (including the leaf-like stipules); texture hard, drying yellow with a cane-like appearance; sheath rather long, expanded and ribbed at base, margins membraneous, length 75, width at base 15, at top 7 mm, stipules reaching beyond the third joint of the rachis but falling far short of the apex of the terminal leaflet, narrow and with acicular tips, length up to 95, width to 2½ mm; other leaflets broader, first pair up to 95 x 4 mm, terminal leaflet up to 80 x 4 mm.

Stem far exceeding the leaves, 45 cm tall, including the head (10 cm); slender, about 6 mm diameter, ribbed; rachis of head flexuous. Bract sheaths rather broad and with wide smooth margins, lowest 17 x 7½ mm, lamina of lower bracts 5-foliolate, of upper ones 3-foliolate, the

lowest segments (stipules) long as in the leaves; female compound umbels longer than the bract sheaths; fruit rather narrow, ribbed, 5 x 2 mm.

This species is placed in the group of *A. hectori* because of its leaf-like stipules and elongate inflorescence. The combination of 7-foliolate leaves, with the lowest leaflets (stipules) not nearly reaching to the end of the terminal leaflets, and the elongate inflorescence marks it off from all the other species of the genus.

DISTRIBUTION. Western part of Mt. Alta Range, Otago, 4,000ft (Petrie, DM). Type specimen.

Aciphylla pinnatifida Petrie, Trans. N.Z. Inst., 43, 254, 1911.

Type from End Peak, Lake Hauroko, in Dominion Museum.

This is the only species of the genus *Aciphylla* with pinnatifid leaves. and as the stipules are leaf-like I place it between the species with simple leaf-like stipules and those with modified stipules. The species is described as pinnatifid because the leaf segments are not jointed on to the midrib as they are in all other species of *Aciphylla,* and they are not opposite. The leaves are 3-foliolate and the leaf-like stipules are nearly as long as the central segment. Rarely the leaf segments are bifurcate. In a leaf 170 mm long the sheath is 50 mm long and about 12 mm wide at the base, central leaflet 120 mm, lateral (stipular) leaflets 95 mm long. Lower part of stem in the female plant about equal in length to the inflorescence, but in the male almost the whole stem bears bracts and compound umbels. Female bract sheaths very wide, length of lowest sheath 32, width 18 mm; laminae of bracts of three nearly equal pinnatifid segments, the upper ones of three simple segments; compound umbels shorter than the bract sheaths. Male bract sheaths longer, and narrower in proportion to length, 60 x 18 mm; in the lower bracts the central segment is pinnatifid, with few short segments, above these the lamina consists of three simple leaflets, and near the top there is only one simple segment. Male compound umbels lax, longer than the bract sheaths. The two sexes thus have rather a different appearance. Rendering the plant more striking is the deep orange colour of the bract sheaths and the olive green leaves with yellow midribs.

DISTRIBUTION. West Otago and Fiordland on mountains in areas of high rainfall, Eyre Mountains (*Speden,* CM). Garvie Mountains (*Heine,* DM; *Poppelwell,* AM, 461). Mt. Tennison (*W. A. Thomson,* CM). Fowler Pass (*Simpson,* BD). Takahe Valley (*Oliver*). Freeman Burn Mountains (AM). Wilmot Pass (*Simpson,* BD, 48083). End Peak (*J. C. Smith,* DM, type). Mt. Cleughearn (*J. C. Smith,* DM) Princess Range (*Speden,* DM, CM). Near Dusky Sound (*Dalrymple,* AM). Adams Burn, Lake Te Au (*Philipson*).

Aciphylla polita (Kirk) Cheeseman, Man. N.Z. Fl., 213, 1906. *Ligusticum politum* Kirk, Student's Flora, 202, 1899.

Type from Ben Nevis in Dominion Museum.

This is the smallest species of *Aciphylla.* It comes closest to *A. monroi,* being similar in habit, with its leaves densely clothed with the bases of fallen leaves, and in having a lax inflorescence overtopping the leaves. The leaf segments average about 1 mm in width and are thus less than half the width of those of *A. monroi.*

DISTRIBUTION. North Island: Tararua Range (*Barclay,* BD, 62272). South Island: Marlborough. Raglan Range (*Jones,* CM). Mt. Fishtail (*Wall,* CM; *McMahon,* CM). Mt. Richmond (*Martin,* DM). Mt. Rintoul (*Gibbs,* AM, 6491). Awatere Valley (*McMahon,* CM). Nelson. Mt. Arthur (*Adams,* AM, 15195), Mt. Peel (*Gibbs,* CM; *Cheeseman,* AM, 6485; *Mason,* BD, 28822). Cobb Valley (*Mason,* BD, 36111). Ben Nevis (*Gibbs,* DM, Type; AM, 6492). Mt. Luna (*Mason,* BD, 58130). Mt. Lockett (*Gibbs,* AM, 6484) Kakapo Peak (*Mason,* BD, 84961). Iron Hill (*Mason,* BD, 36065). Little Wanganui Saddle (*Mason,* BD, 58129). Mt. Duppa. Mt. Starveall.

Aciphylla monroi Hooker, Fl. Nov. Zel., 2, 330, 1855.

Type from summit of McCrae's run, about 4,500ft, in Kew Herbarium. (Plate 7, Fig. 1.)

The sheet containing the type specimen of *Aciphylla monroi* includes as well two other specimens of this species and one of *A. divisa.* As in *A. polita* the lower parts of the leaves of *A. monroi* are covered with a shaggy mass of dead leaf bases. The panicle is lax and is very similar in size and appearance to that of *A. polita.* The leaflets are about twice as wide as are those of *A polita.* In the larger female plants the stem may be as much as two and a-half times the length of the leaves. The female stem in a specimen from Mount Torlesse is 32 cm

tall, the leaves 12 cm long. The stem of the male inflorescence is a good deal shorter than that of the female.

Plate 63 of Cheeseman's *Illustrations of the New Zealand Flora* was evidently drawn from the specimens on the type sheet and, unfortunately, the central figure is a combination of the inflorescence and leaf bases of *A. monroi* and the leaves of *A. divisa*. The single leaf and the leaf tip belong to *A. divisa*, while the flower is from *A. monroi*.

DISTRIBUTION. South Island. Mountainous regions of Marlborough, Nelson, Westland and Canterbury. Marlborough: McCrae's Run, Awatere Valley (*Monro*, Kew Herb., Type). Tarndale (*Allan*, BD). Mt. Trevatore (BD, 11233). Wairau Gorge (*Kirk*, CM; *Cheeseman*, AM, 6481). Awatere Valley (*McMahon*, DM). Mt. Blairish (*McMahon*, AM, 6479). Mt. Tapuaenuku (*Aston*, DM). Clarence Valley (*Kirk*, DM). Mt. Fyfe (*Zotov*, BD, 9482; *Spencer*, DM). Nelson: Mt. Arthur (*Adams*, AM, 15195). Gordons Knob (*Allan*, AM, 6482). Anatoki Range (*Mason*, BD, 34962). Scarface (*Mason*, BD, 34797). Douglas Range (*Mason*, BD, 34853). Anti Crow River (*Mason*, BD, 51470). St. Arnaud Range (*Zotov*, BD, 17458; *Oliver*). Mt. Murchison (*Townson*, DM; AM, 6483). Westland: Lord River (*Mason*, BD, 54208). Hills Peak (*Wall*, CM). Kellys Hill (*Petrie*, DM). Canterbury: Amuri (*Zotov*, BD, 22708). Mt. Isobel (*Wright*, AM). Broken River (*Zotov*, BD, 21351). Mt. Misery (*Mackay*, BD, 62481). Craigieburn Range (*Petrie*, DM). Mt. Torlesse (*Armstrong*, CM; *Cockayne*, DM; *Moore & Cranwell*, AM; *Oliver*). Castle Hill (*Enys*, DM; *Adams*, AM, 15196). Arthurs Pass (*Cockayne*, DM). Mt. Sinclair (*Haast*, CM). Lawrence River (*Wall*, CM).

Aciphylla similis Cheeseman, Trans. N.Z. Inst., 47, 42, 1915.

Type from Arthurs Pass in Auckland Museum (No. 6468). (Plate 2, Fig. 1.)

Allied to *A. monroi*, but a larger and stouter plant, the panicle and its stem, which is 5 mm or more in diameter, reaching a height of 30 to 40 cm. The leaf segments are much wider, longer and smoother than in *A. monroi*. The bract sheaths are also much wider in *A. similis*. Leaves pinnate. In the type specimen the largest leaf is 265 mm long, of which the sheath is 65 and the petiole 80 mm; lowest leaflet 75 x 4 mm. In the type the female head is 130 mm long; lowest bract sheath 20 x 10 mm; lowest peduncle 50 mm. The male head is of the lax branching type as in *A. monroi*. The female head is shorter and closely resembles that of *A. monroi*.

DISTRIBUTION. Mountainous districts from Arthurs Pass southwards. Westland: Kellys Hill (*Simpson*, BD, 70246; *Mackay*, BD, 60061). Griffin Range (*Morgan*, AM, 7475). Canterbury: Arthurs Pass (*Cheeseman*, AM, 6468, Type; *Zotov*, BD, 9842; *Poole*, BD, 22300; *Kirk*, DM; *Oliver*). Upper Rakaia River (*Enys*, AM; *Haast*, DM). Two Thumb Range (*Wall*, AM, 6474; CM). Mt. Somers (*Zotov*, BD, 21360; *Wall*, CM). Macauley River (*Wall*, CM). Tooth Peaks (*Cockayne*, AM, 649; DM). Lawrence River (*Wall*, DM). Mt. Cook (*Buchanan*, DM), Otago: Mt. Cardrona (*Cockayne*, AM, 472; *Petrie*, DM; CM). Mt. Dick (*Cockayne*, AM, 470). Mt. Ida (*Cockayne*, AM, 473). Cecil Peaks (*Wall*, CM). Remarkables (*Speden*, AM, 6463; CM). Hector Mountains (*Petrie*, DM). Eyre Mountains (*Poppelwell*, BD, 64369). Garvie Mountains (*Poppelwell*, AM, 6465; *Speden*, DM).

Aciphylla divisa Cheeseman, Trans. N Z. Inst., 54, 568, 1923.

Type from Hooker Valley, Mt. Cook, in Auckland Museum (No. 6495). *A. monroi* var. *divisa* Cheeseman, Trans. N.Z. Inst., 47, 40, 1915. (Plate 3, Fig. 1.)

The more or less globose and corymb-like inflorescence and 2–3-pinnate leaves places this species next to *A. multisecta* and *A. dissecta*. It differs from *A. multisecta* in its usually bipinnate leaves with wider leaflets, 3 mm as against 1½ mm; and usually by the shorter laminae of the bracts and the shorter segments and petioles of the leaves These two species are thus very closely allied, the conspicuous difference being the broader and shorter leaf segments of *A. divisa*.

DISTRIBUTION. Mountainous districts of the South Island. Nelson: Douglas Range (*Mason*, BD). Westland: Head of Ngatau River (*Simpson*, BD). Canterbury: Mt. Torlesse (*Armstrong*, CM). Tooth Peaks (*Cockayne*, AM). Mt. Ollivier (*Cheeseman*, AM, DM; *Cockayne*, AM). Sealy Range (*Cockayne*, CM; *Petrie*, DM). Hooker Valley, 5,000ft (*Cheeseman*, AM, 6495, type). Otago: Mt. Cardrona

FIG. 1.—*Aciphylla crosbysmithii*, Takahe Valley. (W. R. B. Oliver, photo.) FIG. 2.—*Aciphylla simplex*, Garvie Mountains. (J. Speden, photo.) FIG. 3.—*Aciphylla scott-thomsonii*, Ben More. (W. R. B. Oliver, photo.)

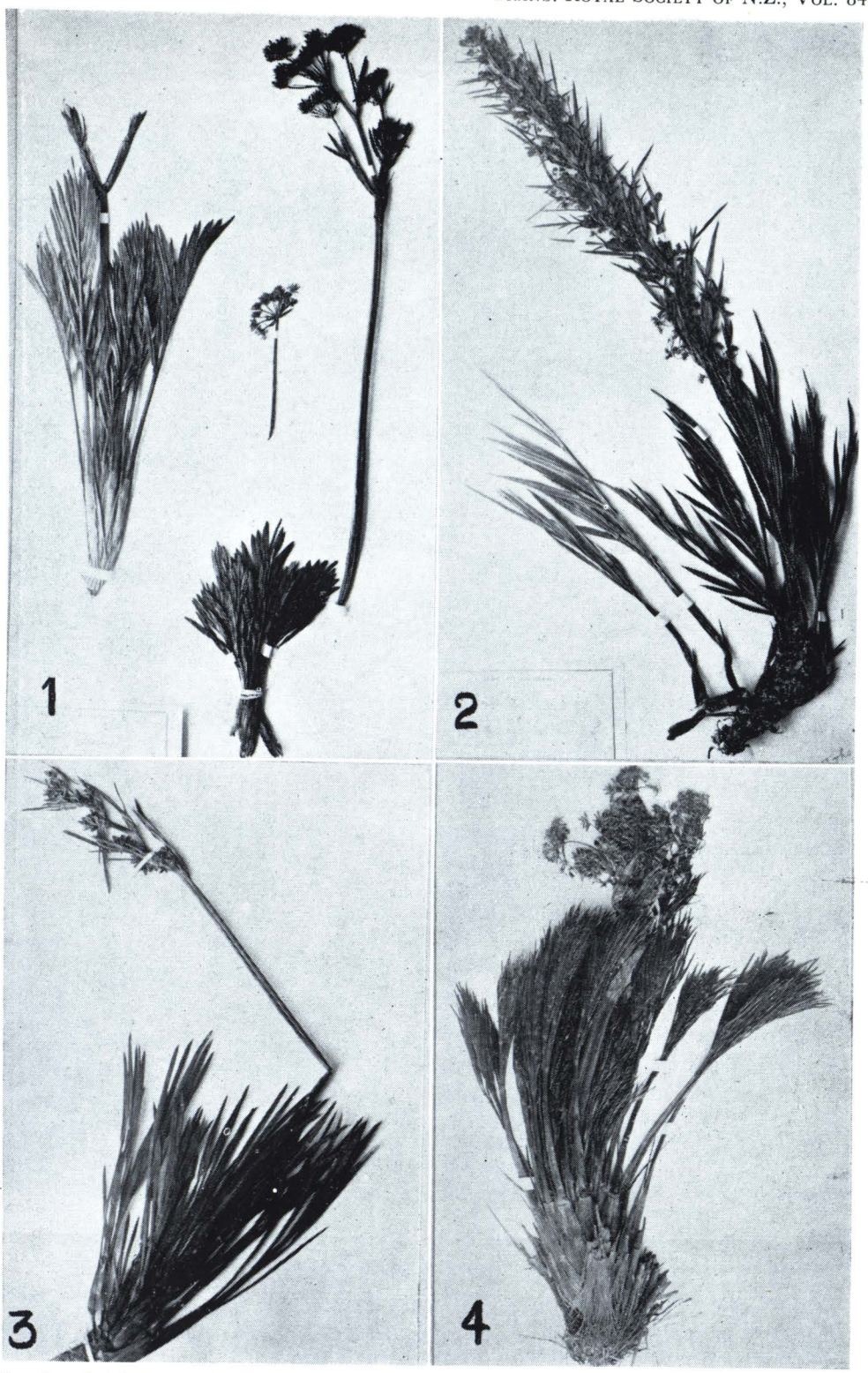

FIG. 1.—*Aciphylla similis*. Type. Arthurs Pass. FIG. 2.—*Aciphylla indurata*. Type. Mt. Lyall.
FIG. 3.—*Aciphylla flexuosa*. Type. Mt. Alta. FIG. 4.—*Aciphylla multisecta*. Type. Mt. Balloon.

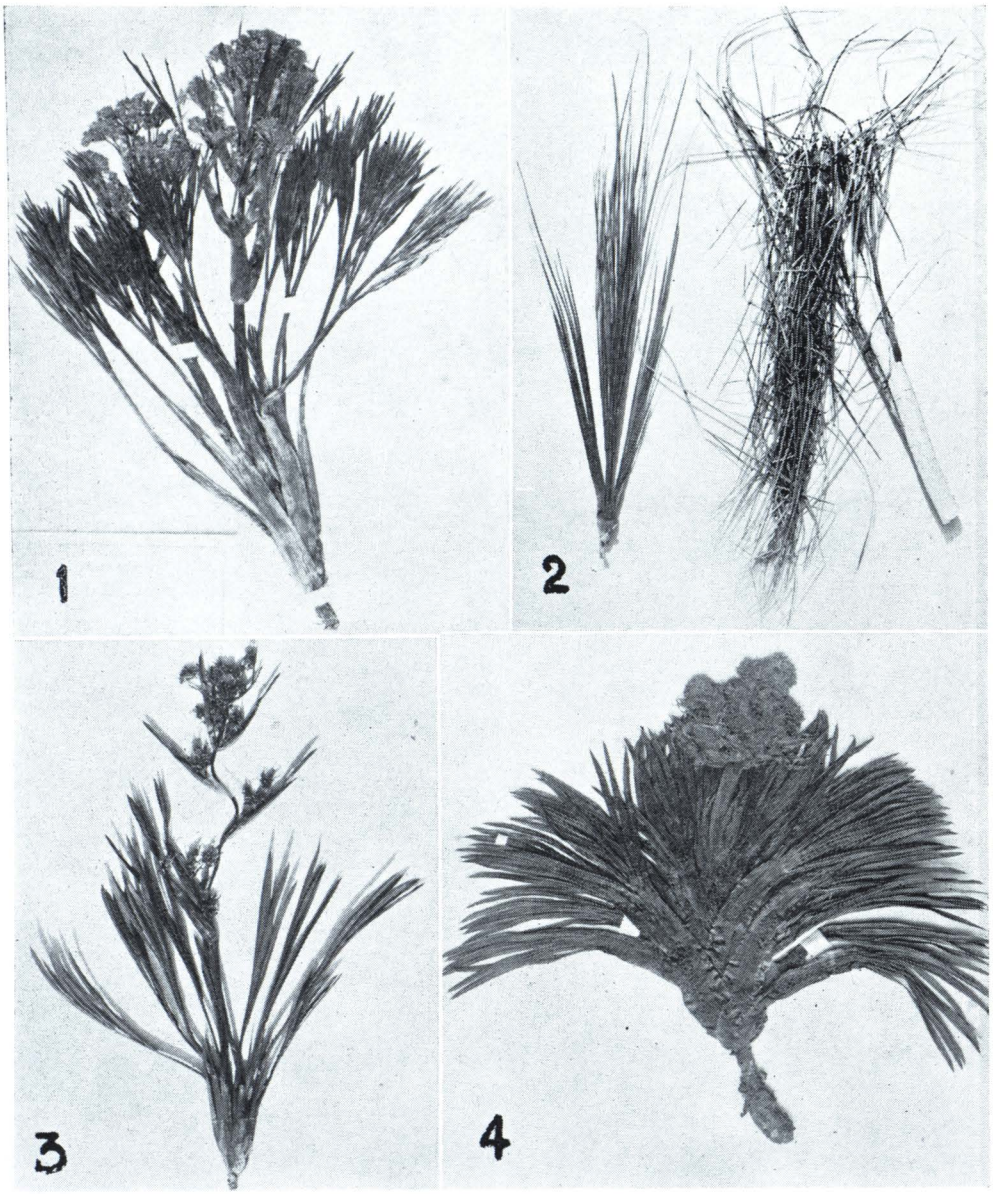

FIG. 1.—*Aciphylla divisa*. Type. Mt. Ollivier, Hooker Valley. FIG. 2.—*Aciphylla subflabellata*. Type. Waiau. FIG. 3.—*Aciphylla gracilis*. Type. Kirkliston Range. FIG. 4.—*Aciphylla spedeni*. Type. Cecil Peaks.

FIG. 1.—*Aciphylla crenulata,* Lake Harris Saddle. FIG. 2.—*Aciphylla glaucescens.* Type. Swampy Hill.

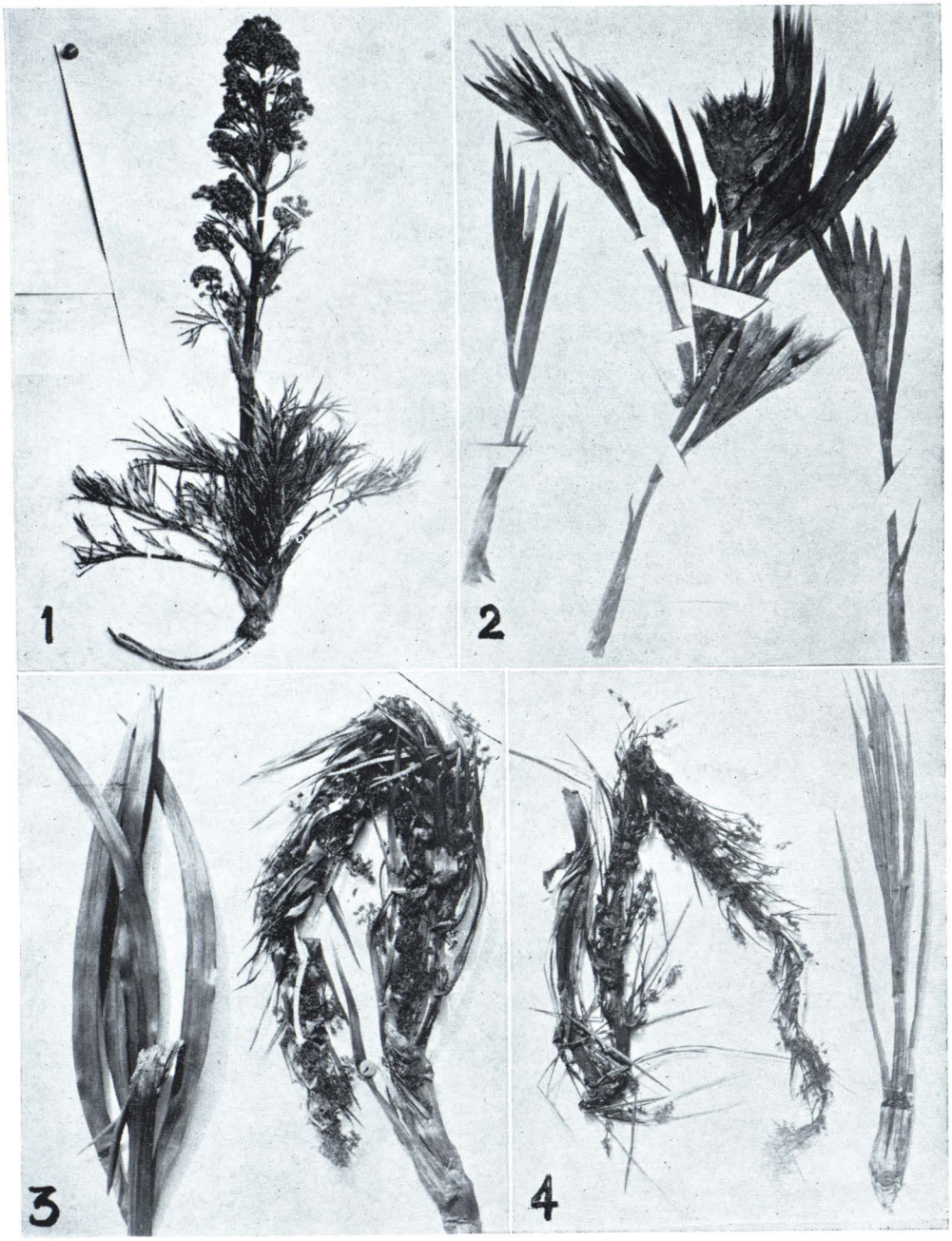

FIG. 1.—*Aciphylla inermis*. Type. Sealy Range. FIG. 2.—*Aciphylla latibracteata*. Type. Temple Hill, Arthurs Pass. FIG. 3.—*Aciphylla horrida*. Type. Alecs Knob. FIG. 4.—*Aciphylla aurea*. Type. Swampy Hill.

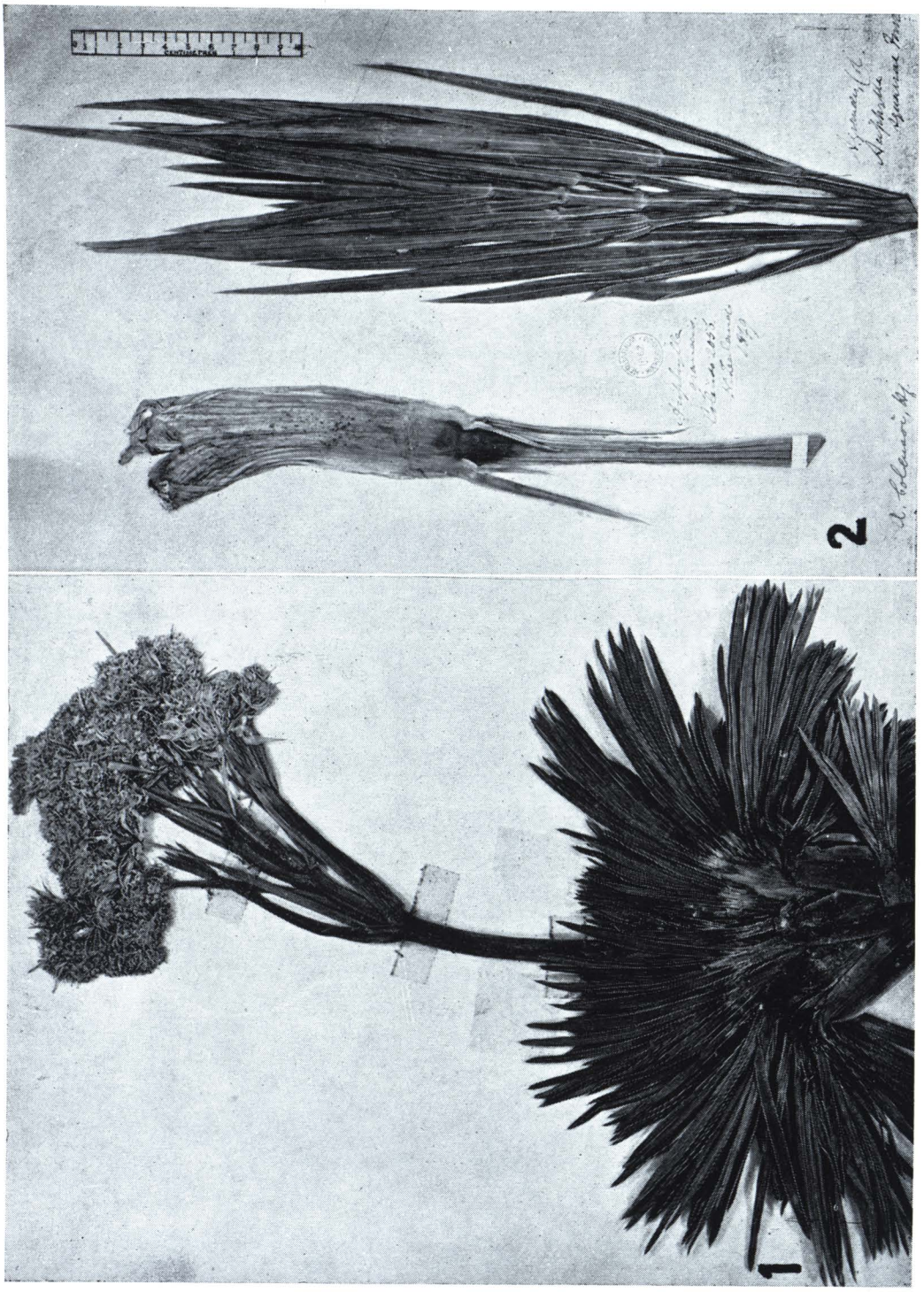

FIG. 1.—*Aciphylla congesta*, Lake Harris. FIG. 2.—*Aciphylla colensoi*. Type leaf. Ruahine Mountains. (Kew Herbarium, photo.)

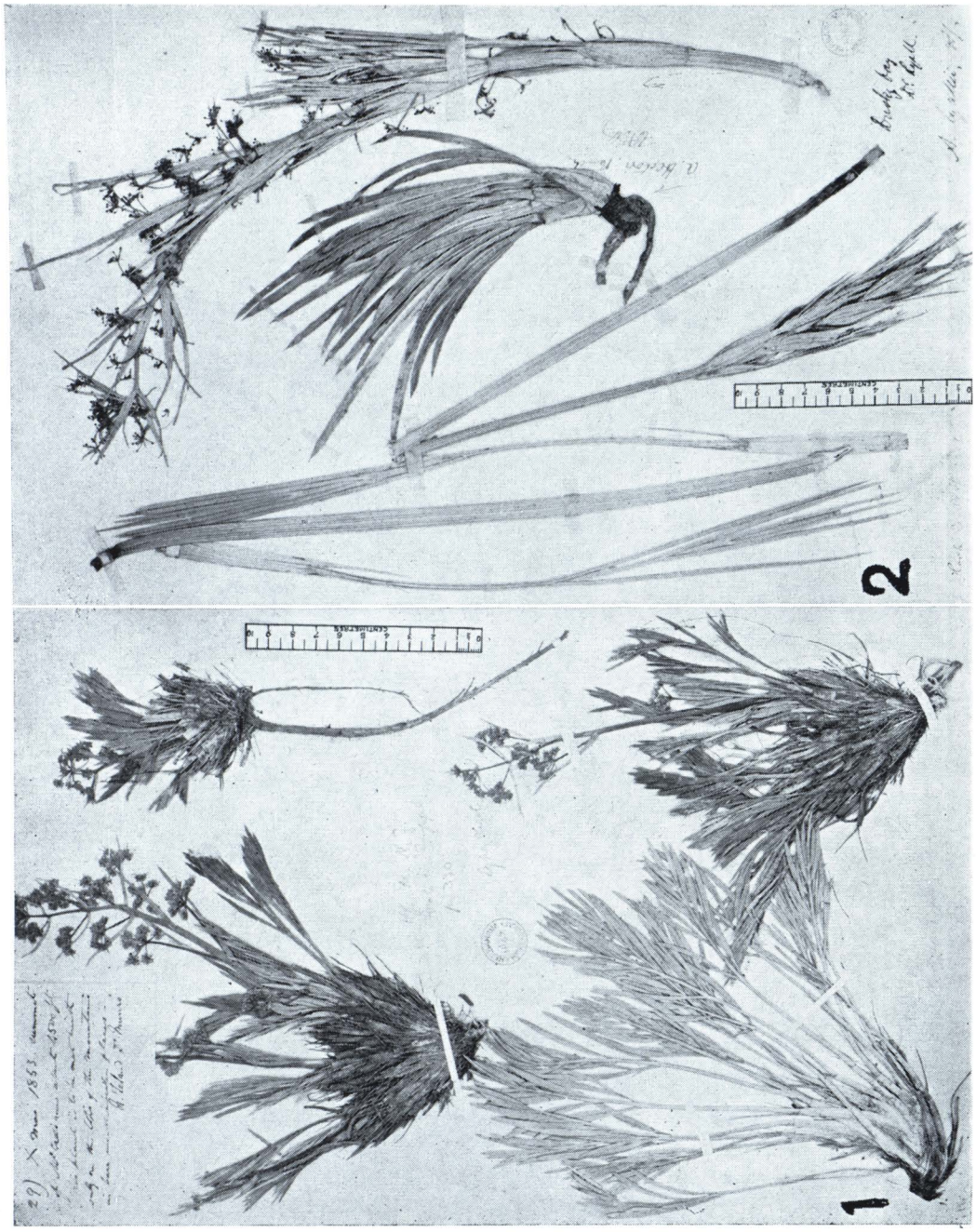

FIG. 1.—*Aciphylla monroi*. Type, top left hand specimen. McCrea's run, Marlborough. (Kew Herbarium, photo.) The lower left hand specimen is *A. divisa*. FIG. 2.—*Aciphylla lyallii*. Types, right ♂, left ♀, Dusky Sound. (Kew Herbarium, photo.) The central figure is of an unidentified species.

FIG. 1.—*Aciphylla verticillata*. Type. Mt. Kyeburn. FIG. 2.—*Aciphylla ferox*. Anatoki Range. FIG. 3.—*Aciphylla ferox*. Type. Mt. Arthur Plateau.

(*Petrie,* DM). Lake Harris (*Wall,* CM; *Cockayne,* AM, BD). Mt. Bonpland (*Petrie,* CM). Ailsa Mountains (*Zotov,* BD). Garvie Mountains (*Poppelwell,* AM). Upper Hollyford Valley (Sansom).

Aciphylla multisecta Cheeseman, Trans. N.Z. Inst., 47, 43, 1915.

Type from Mount Balloon in Auckland Museum. (Plate 2, Fig. 4.)

The distinguishing marks of this species are the narrow leaf segments, 1–1½ mm wide. Where not dwarfed by exposure the leaves are 30–40 cm long with petioles 12–15 cm. The bracts of the inflorescence are correspondingly elongated. On exposed ridges at high altitudes, for instance the summit of Mt. Moltke, 6,700ft, the leaves are quite small, 8–12 cm long, though the flowering head may be quite large, 10 cm long. The nearest ally of this species is *A. divisa,* which it closely resembles in the flower head, but the finely divided 3-pinnate leaves of *A. multisecta* easily distinguish it from *A. divisa.*

DISTRIBUTION. Mountains of Westland, Canterbury and Otago up to 6,700ft, in tussock grassland. Westland: Mt. Moltke (*Mackay,* BD; *Oliver*). Canterbury: Mt. Ollivier (*Cockayne,* BD). Otago: Fowler Pass (*Simpson,* BD). Upper Hollyford Valley (*Moore* & *Cranwell,* BD; *Oliver*). Mt. Balloon (*Gibbs,* AM, 6501, Type; *Wall,* CM). Clinton Saddle (*Laing,* DM). Caswell Sound (*Dalrymple,* BD).

Aciphylla dissecta (Kirk) Oliver, n. comb. *Ligusticum dissectum* Kirk, Students' Fl. N.Z., 202, 1899. Type from Mt. Holdsworth in Dominion Museum (No. 2092).

Though this has hitherto been referred to *Anisotome* on account of its much divided leaves with short acicular-tipped segments, it clearly falls into *Aciphylla* if the nature of the stipules be accepted as of generic importance. In *Aciphylla* they more or less always resemble the leaf segments, but in *Anisotome* the sheath merely ends bluntly in a membrane slightly detached from the petiole. The leaves of *Aciphylla dissecta* resemble those of *Anisotome haastii* but, besides its possessing specialised stipules, *A. dissecta* has a short corymb-like inflorescence like that of *A. divisa* and *A. multisecta.* There are 9 or 10 pairs of leaflets as against 6 or 7 pairs in *A. multisecta* and *A. divisa.* The leaves are 3-pinnate, the bract laminae 2-pinnate.

DISTRIBUTION. Tararua Range 3,500–5,000 feet, in tussock grassland Mt. Holdsworth (*Arnold,* DM, 2092, Type; *Druce,* BD, 82453, 4,200ft). Mt. Hector (*Aston,* CM, 3,500ft). Abundant and collected by all botanists visiting the Tararuas. South Island: Boulder Lake (*Rattenbury,* AM).

Aciphylla hookeri Kirk, Students' Fl. N.Z., 209, 1899.

Type from sources of Heaphy River in Dominion Museum (No. 2093).

In its elongate flower head associated with simple small stipules and crenulate leaves this species may be placed in the group of *A. crenulata,* but there are conspicuous differences from all the other species of the group. The leaflets, rachides and petioles are conspicuously crenate, with the midrib of the leaflets also crenate; but what distinguishes the species at a glance are the flat, squarrose, short dagger-like segments giving the tip of the leaf a trifid appearance.

DISTRIBUTION. Mountains of south-west Nelson. Mt. Faraday (*Townson,* AM). Mt. Buckland (*Townson,* AM, CM; *Petrie,* DM; *Morgan,* DM). Source of Heaphy River (*Dall,* DM, 2093, Type; AM). Mt. Bovis (*Townson,* AM). Croesus Knob, Paparoa Range (*Mackay,* BD). Brunner Mountains (*Townson*).

Aciphylla lyallii Hook. f., Handb. N.Z. Fl., 92, 1864.

Type from Dusky Sound in Kew Herbarium. *A. montana* Armstrong, Trans. N.Z. Inst., 4, 290, 1872. Type from Rangitata district in Canterbury Museum. *A. cuthbertiana* Petrie, Trans. N.Z. Inst., 47, 48, 1915. Type from End Peak in Dominion Museum. (Plate 7, Fig. 2.)

The photograph of the type of *A. lyallii,* here reproduced, shows that it is the species afterwards named by Petrie *A. cuthbertiana.* The type of *A. montana* in the Canterbury Museum clearly belongs to the same species.

Aciphylla lyallii is a rather small plant with elongated inflorescence, the male being longer and more open than the female. The leaf segments are narrow and entirely without crenulated margins. The nearest relative of *A. lyallii* appears to be *A. gracilis,* described below, but the male inflorescence differs in being much stouter in every respect and more dense. I have not seen female flowering heads of *A. gracilis.*

The specimens here included under *A. lyallii* differ a good deal in habit. The type specimens from Dusky Sound belong to the most common form. Specimens from Caswell Sound,

from grassland over 3,000ft altitude, have the male flower head quite similar to that of the typical form (female not seen), but the leaves are very much more slender, average length 45 cm as against 30 cm; stipules and petioles are much longer; leaflets 9-11 instead of the usual 5; leaflets 1½ mm wide as against 3 mm in the typical form. A specimen from Mt. Cleughearn in the Canterbury Museum differs from the typical form in another direction. It is a very large plant with female scape and flower head 40 cm tall, leaves about 50 cm long, 6 mm wide, simple but with irregularly spaced joints; female bract sheaths very broad, 30 mm long, 20 mm wide. It should be mentioned that simple leaves sometimes occur in the typical form. The three forms look very different, but in the absence of better specimens I hesitate to describe them as distinct species. The leaves of the Caswell Sound plant are more distinct from those of the other two forms than they are from each other.

DISTRIBUTION. Mountainous districts from St. Arnaud Range to Foveaux Strait, mainly in the areas of high rainfall. St. Arnaud Range (*Wall,* CM). Rangitata Mountains (*Gray & Armstrong,* CM, type of *A. montana;* DM). Hunter Mountains (*Thomson,* BD). Mt. Cook (*Mason,* BD). Lake Ohau Mountains (*Kendell*), Mt. St. Mary (*Simpson,* BD). Fowler Pass (*Simpson,* BD). Dore Pass (*Wall,* CM). Takahe Valley (*Oliver*). Caswell Sound (*Poole,* BD, 67223; *Oliver*). Doubtful Sound (*Thomson,* DM). Dusky Sound (*Lyall,* Kew Herb., Type of *A. lyallii*). End Peak (*J. C. Smith,* DM, type of *A. cuthbertiana*). Mt. Cleughearn (*Wall,* CM; *J. C. Smith & Cuthbert*). The Hump (*Speden,* DM). Princess Ra. (*Thomson,* CM). Takitimu Mountains (*Wall,* CM). Adams Burn, Lake Te Au (*Philipson*). Waterfall Creek, Lake Te Anau (*Philipson*).

Aciphylla gracilis n.sp.

Affinis *A. lyallii* Hook. f., a qua differt caule multo graciliore, masculo inflorescentia laxiore, bractea angustiore. (Plate 3, Fig. 3.)

Folia pauca pinnata, 3–5-foliata, segmentis linearibus, vaginis angustis sensim deorsum dilatatis. Masculus caulis gracilis, striatus, usque ad 22 cm altus. Bracteae distantes; vaginis tenuibus, angustibus, 20–25 mm longis; stipulis acicularibus, apice 3–5-foliolatis. Masculae umbellae compositae quam vaginae longiores. Femineae flores ignotae

Leaves few, up to 12 cm long, usually under 15 to a plant, pinnate, 2 pairs, sometimes 1, of leaflets and a terminal one which occasionally has an extra leaflet. Sheath rather narrow, widening at the base, smooth above, ribbed below, length 30 mm, width at base 8 mm; stipules acicular, 10–20 mm long; petiole smooth, 25–35 mm long; leaflets up to 45 x 3 mm, smooth, acicular at tips. Male stem slender, 2 mm in diameter, striate, including the flower head up to 22 cm tall Bracts about 8, distant, making an open panicle, sheaths thin, almost membraneous, 20–25 mm long, about 7 mm wide at base, faintly ribbed; stipules acicular, 5–6 mm long, laminae of lowest bracts with 3 to 5 segments, remainder of one segment only, the uppermost without stipules. Compound umbels with long stalks and linear bracteoles longer than the pedicels. Female flowers not seen.

Type from Kirkliston Range, collected by W. R. B. Oliver, 1951, in Dominion Museum.

Nearest related to *A. lyallii* in its smooth, 3–5-foliolate leaves without crenulate margins, and in the open male inflorescence, but it is a much smaller plant with all its parts much more slender and delicate.

DISTRIBUTION. Kirkliston Range (*Oliver,* DM, type). Lake Ohau (*Kendell*).

Aciphylla trifoliolata Petrie, Trans. N.Z. Inst., 48, 186, 1916.

Type from Mt. Lyell in Dominion Museum.

The pinnate leaves with serrulate margins and the elongate inflorescence place this species near *A. crenulata.* These two species differ very much in all their main characters. The leaves of *A. trifoliolata* are much firmer in texture, being almost cane-like with regularly spaced dark grooves, and they keep their form when dry. The leaflets and petioles are much shorter than in *A. crenulata.* In the inflorescence of *A. trifoliolata* the bracts have long sheaths, up to 60 mm, and the central leaflet is long and wide, 80 x 5 mm. The bracts are closely placed on the stems so that the flowers are mostly hidden by the central segments In *A. crenulata* the bract segments are narrow and their sheaths mostly short.

DISTRIBUTION. Mt. Lyell, S. W. Nelson, 4,000ft (*Townson,* AM, DM, type; CM).

Aciphylla crenulata Armstrong, N Z. Country Journ., 3, 56, 1879.

Type from Arthurs Pass in Canterbury Museum. (Plate 4, Fig. 1.)

This grass-like species is placed near *A. trifoliolata* on account of its pinnate leaves, leaflets with serrulate margins, and elongated inflorescence. It differs from *A. trifoliolata* in the narrow

leaflets of the bracts, in its long, flaccid, grass-like leaves, and in the long, narrow inflorescence. Through a misunderstanding of what the type of *A. lyallii* was like, *A. crenulata* has been much confused with that species both in herbaria and in literature. *A. lyallii,* in contrast to *A. crenulata,* has hard cane-like leaves with smooth edges while the bracts are entirely different from those of *A. crenulata.* The leaf sheaths of *A. crenulata* are broad and thin, almost membraneous, 80 mm long, 8 mm wide at top, 20 mm at base. Stipules 1–3-foliolate, the central segment often reaching more than half way up the petiole. Leaves with 2–3 pairs of leaflets, which are up to 150 mm long and 5 mm wide. When fresh the midrib is often bright red. Female inflorescence much longer than the leaves, up to 60 cm long or more. The bracts are borne on the upper two-thirds of the stem. Usually the lower bracts are sterile. Bract stipules 1–3-foliolate, the central segment being long with a strong midrib below; margins of leaflets and midrib serrulate. Male plant usually smaller and less robust than the female. A form with narrow leaves has been collected in Nelson and Otago (Lake Harris, BD. 11281). Three specimens from Lake Harris in the Auckland Museum (6445, 6446.1, 6448) appear to be fasciated forms of *A. crenulata*

DISTRIBUTION. Mountains from Nelson Province to Foveaux Strait in the region of high rainfall. Nelson: Mt. Arthur (*Cheeseman,* AM; *Mason,* BD). Mt. Zetland (*Mason,* BD). Mt. Peel (*Mason,* BD). Westland: Hills Peak (*Wall,* CM; *Cockayne,* AM, DM). Mt. Barron (*Cockayne,* AM, DM). Mt. Hooker (*Mason,* BD). Alecs Knob (*Wood,* AM; *Allan,* BD; *Oliver*). Canterbury: Arthurs Pass (*J. B. Armstrong,* CM, type; *Cheeseman,* AM, CM; *Oliver,* DM). Brownings Pass (*Haast,* CM). Rakaia and Rangitata sources (*Armstrong*). Malte Brun (*Wall,* CM). Mt. Ollivier (*Cheeseman,* AM, DM). Mueller Glacier (*Wall,* CM). Copeland Pass (*Wall,* CM). Otago: Mt. Ida (*Matthews,* AM). Humboldt Mountains (*Cockayne,* AM, DM). Bold Peak (*Poppelwell,* AM; *Speden,* DM). Lake Harris (*Cockayne,* AM; *Zotov,* BD; *Thomson,* DM). Routeburn (*Allen,* BD). Wilmot Pass (*Simpson & Thomson*). Upper Hollyford (*Simpson & Thomson*). McKinnon Pass (*Simpson & Thomson*). Upper Freeman (*Simpson,* BD). Dusky Sound (*Lyall*). Princess Range (*Speden,* DM).

Aciphylla townsoni Cheeseman, Man. N.Z Flora, 1138, 1906.

Type from Mt. Buckland in Auckland Museum.

The nearest relation of *A. townsoni* in New Zealand is *A. crenulata,* but it differs from that species in its narrower and more flaccid leaves, the average width of the leaflets being 1½ mm. The inflorescence is shorter and more open The leaf sheaths are thin and fairly long and the stipules acicular, up to 17 mm long or absent. The laminae may be simple, trifoliolate, pinnate with 2 or 3 pairs of leaflets, or bipinnate, in the last respect differing from *A. crenulata.* Leaves up to 20 c long. Inflorescence overtopping the leaves Bracts: Lowest with acicular stipules about 6 mm long and with pinnate laminae, upper ones with minute stipules and simple laminae.

DISTRIBUTION. Mountains of west Nelson and Westland. Mt. Buckland (*Townson,* AM, type; DM). Mt. Faraday (*Townson,* DM, AM). Mt. Lyell (*Townson,* AM). Mt. Arthur (*Heine,* DM). Boulder Lake (*Simpson & Thomson*). Kellys Hill (*Petrie,* DM). Paparoa Range (*Townson,* AM; *Mackay,* BD). Head of Baton River (*Oliver*), all leaves simple with joints at irregular intervals, no stipules.

Aciphylla simplicifolia (F. Muell.) Bentham, Fl. Austr., 3, 375, 1866.

Gingidium simplicifolium F. Muell., Trans. Phil. Soc. Vic., 1, 104, 1855; Pl. Vict., t. 27, 1864-65. Type from Cobboras Mountains, in National Herbarium, Melbourne.

Leaves all radical, simple, about 25 cm long. Sheath strongly ribbed in centre, with wide smooth margins; 55 x 6 mm; no stipules; lamina linear, ribbed, a transverse joint every 10–12 mm; apex rounded. Stem a little longer than the leaves, finely ribbed, bearing compound umbels on the uppermost third. Compound umbels alternate or subopposite, about 6, with a terminal umbel of about 10 rays. Peduncles slender, long, terminated by an umbel of 6–8 umbellules on slender pedicels of different lengths. Umbellules of numerous shortly stalked flowers with lanceolate bracteoles. Bracts shorter than the compound umbels, lowest bract 26 mm, compound umbel 42 mm; bract sheaths rather broad, gradually narrowing to a blunt, linear, simple lamina. " Petals rather narrow, scarcely pointed. Fruit oblong, 4–5 lines long, the carpels dorsally flattened, the ribs all acutely prominent, but the lateral ones twice as broad as the others and almost winged. Vittae often very obscure." (Bentham).

A. simplicifolia resembles *A. townsoni* more than it does any other New Zealand species, but *A. simplicifolia* differs in the blunt-pointed, simple leaves and bract laminae, absence of

stipules, oblong inflorescence and the bracts being shorter than the compound umbels. All New Zealand species of *Aciphylla* except *A. simplex* possess stipules, leaf-like or modified. However, some leaves of *A. townsoni* are, like *simplicifolia*, without stipules. Hence *A. simplicifolia* is included in the genus *Aciphylla*, mainly on account of its affinities with *A. townsoni*.

DISTRIBUTION. New South Wales. Queanbeyan, 4,500ft (*Cambage*, Nat. Herb. N.S.W.). Mt. Gingera (*Smith*, Nat. Herb. Vic.). Mt. Kosciusco (*Mueller*, Nat. Herb. Vic.; *Skottsberg & Costin*, NHNSW). Bullrock Range (NHNSW). Snowy River, 5,700ft (*Johnson*, NHNSW). Kiandra (*Forsyth*, NHNSW). Victoria: Mt. Wellington, 5,000ft (*Mueller*, NHV). Barry Mountains, 5,300ft (*Willis*, NHV). Mt. Buffalo (*Wreath*, NHNSW; *Sutton*, NHV). Mt. Hotham, 5,800ft (*Tadgell*, NHV). Mt. Bugong, 5,600ft (*Tadgell*, NHV). Cobboras Mountains, 5,000–6,000ft (*Mueller*, NHV, Type).

Aciphylla indurata Cheeseman, Trans. N.Z. Inst., 47, 40, 1915.

Type from Mt. Lyell in Auckland Museum (No. 6431). (Plate 2, Fig. 2.)

A species more robust than *A. crenulata* and with rather short, bipinnate leaves and large, stout, inflorescence much overtopping the leaves. Leaves with 3–4 pairs of leaflets, the lowest one or two again pinnate. Leaves up to 40 cm long, the terminal leaflet 140 x 8 mm. Leaflets striate, with strong reddish midrib, margins serrulate. Stem stout, 50 cm tall, 10 mm in diameter at the base. Lowest bract sheath 40 x 14 mm; stipules dagger-like, terminal segment about twice as long as the lateral ones. Compound umbels longer than the bract sheaths. Cheeseman compares this species with *A. hookeri*, but the Mt. Bovis specimen which he quotes looks like a hybrid between the two species.

DISTRIBUTION. South-west Nelson and Westland. Mt. Lyell (*Townson*, AM, DM). Brunner Range (*Townson*, CM). Mt. Bovis (*Townson*, DM; perhaps hybrid). Griffin Range (*Morgan*, AM).

Aciphylla subflabellata n.sp.

Affinis *A. squarrosa* Forst. a qua differt foliis multo brevioribus, subflabellatis, bipinnatis, petiolis brevioribus. (Plate 3, Fig. 2.)

Folia radicalia, conferta, bipinnata, subflabellata, usque ad 50 cm longa, vaginis tenuibus, stipulis bipinnatis, marginibus serrulatis; pinnae inferne pinnatae, superne simplices Caulis robustus, costatus. Bracteae numerosae, vaginis usque ad 65 mm longis, stipulis bifidis vel simplicibus, laminis inferne pinnatis superne simplicibus, segmento medio reflexo.

Leaves all radical, forming a dense rosette at the base of the stem, short, up to 50 cm long. Sheath rather thin, up to 18 mm wide at the top where it divides into three parts, the lateral ones continuing for 10 mm or so to the base of the stipules. Stipules about three-fourths the length of the leaf, trifoliolate, the central segment pinnate, the lateral ones 1–3-foliolate. Petiole and internodes of rachis short, giving a semiflabellate form to the leaf; leaflets four pairs, the lower ones pinnate, the uppermost simple, narrow, serrulate on margins and midrib, ending in acicular points 2–3 mm long; midrib narrow, upper central ridge broad and flat. Leaflets up to 23 cm long and 3 mm wide.

Stem stout, erect, ribbed, up to 100 cm tall, and 25 mm in diameter at the base, with coarse and fine roughened ribs. Flowering bracts closely placed on the upper two-thirds or more. Bract sheaths up to 60 mm long and 10 mm wide, weakly ribbed. Stipules bifid below, simple above; laminae pinnate below, simple above, central segment very long, up to 30 cm long on lowest bracts, turned down. Margins of segments serrulate. Compound umbels longer than the bract sheaths, the male ones being about twice as long.

Type specimen from Waiau, growing in tussock grassland, collected by W. R. B. Oliver, in Dominion Museum.

Aciphylla subflabellata is closely related to *A. squarrosa*, agreeing in the narrow leaflets, tall erect stem, and the terminal segments of the bracts being sharply turned down. It differs in the short petiole and internodes of the rachis, giving the leaf a subflabellate shape; it is always bipinnate and the terminal segments of the bracts are very long. The specimens from Swampy Hill and Kirkliston Range agree in all essential features with *A. subflabellata* but the leaves are much shorter and the leaflets fewer and wider. Further collecting is required before their taxonomic status can be accurately determined.

DISTRIBUTION. South Island in the drier eastern districts. Canterbury: Weka Pass (*Oliver*). Banks Pen. (*Oliver; Kirk*, AM). Waiau (*Oliver*, DM, type). Ashley Gorge (*Heine*, DM). Broken River (*Petrie*, AM; *Cheeseman*, AM). Mt. Torlesse (*Oliver*). Otago: Kirkliston Range (*Oliver*). Taieri Plain (*Simpson*). Swampy Hill (*Oliver*).

Aciphylla squarrosa Forst., Char. Gen., 136, Pl. 68, 1776.

Type from Totaranui, Queen Charlotte Sound, in British Museum.

Aciphylla squarrosa was the first species of *Aciphylla* to be described, and is the type species of the genus. It comes close to *A. subflabellata,* but can be recognised by its wide-spreading leaves with long petioles and internodes of the rachis, tripinnate leaves and shorter segments of the bracts.

DISTRIBUTION. North Island and northern end of South Island from the sea coast to 4,000ft altitude. North Island: Mt. Hikurangi (*Moore & Cranwell,* AM). Mt. Maungapohatu (*Moore & Cranwell,* AM). Mt. Kakaramea (*Cheeseman,* AM). Taupo (*Adams,* AM). Waimarino Plain (*Petrie,* DM; *Matthews,* AM; *Oliver*). Mt. Ruapehu (*Oliver*), Kaimanawa Range (*Aston,* DM). Moawhango River (*Mason,* BD). Mt. Egmont (*Cheeseman,* AM). Cook Strait, north side. South Island: Queen Charlotte Sound (*Forster,* Br. Mus. type).

Aciphylla takahea n.sp.

Affinis *A. squarrosa* Forst. a qua differt foliis multo brevioribus, bipinnatis, foliolis latioribus et brevioribus; segmentis bracteorum haud reflexis; mascula inflorescentia multo minores.

Folia bipinnata, feminea usque ad 40 cm longa, mascula usque ad 25 cm longa; stipulis 3-foliolatis; foliolis 5-jugis, 3–2–1-foliolatis, inferne 130 x 5 mm. Femineus caulis robustus, erectus, costatus, usque ad 1 m altus. Bracteae inferne pinnatae, superne simplices; stipulis 2–3-foliolatis, superne simplicibus; umbellis compositis quam vaginis longioribus. Masculus caulis gracilis, usque ad 60 cm altus, vaginis bracteorum quam femineis angustioribus.

Leaves all radical, bipinnate, less than half the length of the stem; length of leaves of female plant up to 38 cm, of male up to 25 cm. Sheath (female) short, up to 50 mm long, width at top 15, at base 30 mm. Stipules 3-foliolate, the central segment sometimes longer than the leaf petiole. Leaflets 5 pairs, the two or three lowest trifoliolate, gradually tapering to an acicular tip, margins and midrib serrulate, lowest leaflet up to 130 x 5 mm.

Stem of female plant stout, erect, with prominent ribs, 1 m tall or more. Bracts occupying more than half the length of the stem, the lower ones sterile; sheath of lowest fertile bracts 40 mm long; stipules 3-foliolate; the upper ones simple; leaflets two pairs and a longer terminal one, in the uppermost bracts the lamina is simple; female compound umbels longer than the bract sheaths; fruit 8 mm long.

Male inflorescence much smaller than the female and with much less robust stem, about 60 cm tall, the bracts occupying more than two-thirds the length of the stem; bract sheaths narrower and laminae less robust and with fewer segments than in the female; compound umbels longer than the bract sheaths.

Type from Takahe Valley, Murchison Range, collected by W. R. B. Oliver, in Dominion Museum.

A. takahea recalls *A. squarrosa* in the stout, tall stem of the female plant, and in the narrow leaflets with serrulate margins, but the leaves are entirely different and more nearly resemble those of *A. indurata.* Also the leaves of *A. takahea* are bipinnate, the leaflets wider and flatter, and the middle segment of the bracts not turned down. The male inflorescence is much smaller than it is in *A. squarrosa.* Were it not for the tall, stout female inflorescence this species might be placed near to *A. indurata.*

DISTRIBUTION. Takahe Valley, Murchison Range (*Oliver,* DM, type). Ben Lomond (*Zotov,* BD). Waterfall Creek, Lake Te Anau (*Philipson*). It is likely that this species will be found in other localities in the mountains of the South Island.

Aciphylla glaucescens n.sp

Affinis *A. squarrosa* Forst., a qua differt caule valde majore, foliis majoribus, flaccidis, glaucis, vaginis bracteorum multo longioribus et angustioribus, segmentis mediis bracteorum haud reflexis. (Plate 4, Fig. 2.)

Folia 3-pinnata, glauca, flaccida, usque ad 1–5 m longa; vaginis longis; stipulis 3-foliolatis, usque ad 30 cm longis. Petiolus costatus, usque ad 35 cm longus. Foliola pinnata, segmentis terminalibus usque ad 45 cm longis. Caulis robustus, costatus, usque ad 2 m altus. Bracteae numerosae, bipinnatae; vaginis usque ad 120 mm longis, stipulis simplicibus; limbis usque ad 50 cm longis. Umbellae compositae quam vaginae bracteorum longiores.

Leaves tripinnate, glaucous, with long sheaths and petioles; total length up to 1½ m. Sheath up to 20 cm or more long, 30 mm wide at top, up to 70 mm wide at base; upper surface smooth, yellowish with dark parallel grooves. Stipules with sheaths 45 mm long and 8 mm wide, sharply ridged below, flat above; ridge and margins minutely serrulate, purplish

green with narrow dark lines; trifoliolate, the central segment up to 30 cm long and 4 mm wide. Petiole 30–35 mm long, 17 mm wide at base, 9 mm at top, smooth, finely ribbed below, strongly ribbed above. Leaflets with long petiolules and trifoliolate and simple pinnae, about 4 mm wide, with margins and midrib minutely serrulate.

Stem robust, coarsely ribbed, 1½–2 m tall, diameter at base up to 70 mm, clothed with numerous bracts from near the base. Bract sheaths long and narrow, golden yellow or paler, lowest 90 mm long, with long, narrow simple or pinnate stipules and pinnate laminae up to 40 cm long. In the female panicle the bracts are copious and partly hide the flowers; in the male they are more scanty and smaller. Female compound umbels on long stalks which exceed the sheaths; bracteoles narrow lanceolate with acicular tips, 8 mm long. Male compound umbels of similar length but more slender and branching from the base, and with narrower bracteoles.

Type from Swampy Hill, Otago, collected by W. R. B. Oliver, in Dominion Museum.

This magnificent species has been noticed by various collectors but has not before received a specific name. Perhaps Kirk's variety *flaccida* of *A. squarrosa* from the Ruahine Range belongs to this species, but neither his specimens nor his description agrees wholly with the typical large form of the species. The *Aciphylla* briefly described by Martin as having glaucous blue leaves and bearing flower stalks often five or six feet in length, from the Seaward Kaikouras, is evidently this species. *A. glaucescens* is clearly distinct from *A. squarrosa* in its large size, flaccid leaves, longer and narrower bract sheaths, and in the terminal bract segment not turning down. *A. squarrosa* is, however, its nearest relative, agreeing generally in the narrow leaflets with serrulate margins, 3-pinnate leaves and trifoliolate stipules.

DISTRIBUTION. North Island: Mt. Hikurangi (*Moore & Cranwell,* AM). Maungapohatu (*Moore & Cranwell,* AM). Waimarino (*Carse,* CM). Ruahine Range (Howlett, DM, var. *flaccida*). Tararua Range (*Oliver*). Marlborough: Wairau Valley (*Cheeseman,* AM). Lynton Downs (*Kirk,* DM). Mt. Stace, Seaward Kaikouras (*Mason,* BD). Kahutara Saddle (*Martin*). Nelson: Mt. Arthur (*Cheeseman,* AM; *Adams,* AM). Mt. Owen (*Townson,* AM). Canterbury: Hanmer Plains (*Haast,* CM). Otago: Swampy Hill (*Oliver,* DM, type). Remarkables (*Oliver*). Warepa (*Petrie,* DM). Near Riverton (*Kirk,* DM). Head of Baton River (*Oliver*).

Aciphylla intermedia Petrie, Trans. N.Z. Inst., 44, 180, 1912.

Type from Mt. Holdsworth, Tararua Range, in Dominion Museum.

This species is unlike any other kind of *Aciphylla.* The long sheath and the shorter petiole make up about half the length of the leaf. There are about eight pairs of leaflets instead of the usual four in the genus. Mr. A. P. Druce has suggested to me that, on account of its oblong inflorescence, short leaf segments and large number of pairs of pinnae, it is a hybrid between *A. colensoi* and *A. dissecta.*

DISTRIBUTION. Tararua Range, North Island. Mt. Hector (*Aston,* DM; CM). Mt. Holdsworth (*Aston,* DM; *Townson,* AM). Mt. Crawford (*Zotov,* BD). Mt. Denham (*Zotov,* BD).

Aciphylla inermis n.sp.

Folia bipinnata, flaccida, usque ad 25 cm longa; vaginis brevibus, latis, nervis paraellelis manifestis; stipulis linearibus; segmentis 3 mm latis. Caulis robustus, usque ad 50 cm altus. Bracteae subverticillatae, remotae, vaginis basi 15 mm latis, apice 3 mm latis; limbe pinnate vel bipinnate. Masculae umbellae compositae quam bracteae longiores, pedunculis usque ad 10 cm longis Feminea inflorescentia ignota. (Plate 5, Fig. 1.)

Leaves bipinnate, flaccid, up to 25 cm long. Sheaths short and broad, up to 45 mm long and 20 mm wide at base. Stipules simple, 30 to 45 mm long, 1 mm wide. Petiole about the same length as the sheath. Leaflets 4–5 pairs, pinnate, the uppermost simple, segments narrow, up to 60 mm long and 3 mm wide, striate, with slightly thickened margins and acicular points.

Stem moderately stout, about 10 mm in diameter at base, finely ribbed. Bracts in about 9 whorls extending over more than half the length of the stem, sheaths thin, lowest 40 mm long, 15 mm wide at base, 3 mm at top. Stipules linear, up to 15 mm long and ending in a fine bristle 2–3 mm long; lamina pinnate with 3 pairs of segments and a terminal one. Upper bracts with 2 pairs and uppermost with one pair of segments or simple. Male compound umbels longer than the bracts, copiously branched, the main umbel with numerous rays, up to about 20, the ultimate umbellules with 10–15 flowers. Female inflorescence not seen.

Type from Sealy Range, collected by H. Suter, in Dominion Museum. Only known specimen.

This fine species is unlike any other. In the key I have bracketed it with *A. intermedia* because of the smooth margins of the leaves, but there the resemblance ends. On account of the linear stipules it falls into *Aciphylla,* but the appearance of the leaves is somewhat like that of *Coxella.* The inflorescence in full flower on the living plant must have been a beautiful sight.

Aciphylla traversii (Mueller) Hooker, Handb. N.Z. Fl., 2, 729, 1867.

Gingidium traversii Mueller, Veg. Chat. Is., 18, 1864. Type from Chatham Islands collected by H. H. Travers, in National Herbarium, Melbourne. Mueller's discription is deficient. It was condensed by Hooker. The first adequate description was given by Buchanan in Trans. N.Z. Inst., Vol. 7, p. 335, 1875.

A. traversii is distinguished by its pinnate leaves, of which the leaflets are conspicuously transversely jointed and have smooth or nearly smooth margins. The sheath and petiole together is shorter than the lamina. The stipules are dagger-like and quite short. The lower bracts are trifoliolate, the remainder unifoliolate; short pointed stipules are present except on the uppermost bracts. The species has no near allies.

DISTRIBUTION. Chatham Islands (Travers, Melb. Herb., type; *Cockayne & Cox,* AM; *Kirk,* AM; *Cox,* DM).

Aciphylla latibracteata n.sp.

Folia pinnata, usque ad 30 cm longa; vaginis usque ad 50 mm longis; stipulis subulatis, quam petiolis brevioribus; foliolis 4-jugis, striatis, usque ad 105 mm longis, 7 mm latis, marginibus levibus. Caulis erectus; vaginis bracteorum latis; nervis parallelis manifestis; limbe trifoliolate, segmentis latis. (Plate 5, Fig. 2.)

Leaves pinnate; leaflets 4 pairs and terminal one, rather closely placed in the upper half of the leaf; sheaths up to 50 mm long and 25 mm wide at base, stipules more than half the length of the petiole; lowest leaflet 105 x 7 mm; leaflets linear, narrowing at apex to a short spinous point, striate, midrib, not evident, margins smooth.

Stem (young) shorter than the leaves. In the only known specimen the flower head, which is a male, has not fully opened so it is not possible to say what the mature inflorescence is like. The bracts are distinctive; sheath short and wide, 28 x 15 mm, with 11 regularly spaced, faintly serrulate ribs; stipules with wide base abruptly narrowing at first, two ribs near the inner margin; petiole short and broad, striate, 6 x 3 mm; lamina 3-foliolate, the segments of nearly equal length, short and wide, terminal one 26 x 4 mm.

Type from Temple Hill, Westland, collected by L. Cockayne, 1898, in Dominion Museum.

The pinnate leaves with smooth margins recall *A. similis,* but the inflorescence, when fully grown, would no doubt be an elongated panicle, and so I have placed this species in the group having erect stems. Its resemblance to *A. traversii* is in the pinnate smooth leaves and the nearly equal segments of the bract laminae, but these characters may not indicate any close relationship.

Aciphylla aurea n.sp.

Folia pinnata vel bipinnata, usque ad 70 cm longa; stipulis quam petiolis multo longioribus, usque ad 27 cm longis; foliolis 2–4-jugis, 1–3-foliolatis, laevis, marginibus serrulatis. Caulis robustus, costatus, usque ad 80 cm altus. Bracteae numerosae; vaginis angustatis, aureis, 3-foliolatis, usque ad 40 cm longis. Femineae umbellae compositae usque ad 15 cm longae, bracteolis vaginis et segmentis simplicibus. (Plate 5, Fig. 4.)

Leaves all radical, numerous, forming a cluster up to 1 m across and ½ m tall. Leaves including the sheath up to 70 cm long. Sheath thick in centre with broad thin margins, greenish yellow, the margins paler, width at top 25 mm. Stipules very long, leaf-like, but narrower than the segments of the leaf lamina, often extending far beyond the top of the petiole, sometimes more than twice as long; ridged below at base; up to 27 cm long and 8 mm wide at base. Petiole rather narrow, up to 22 cm long, 16 mm wide at base and 12 mm at top, margins finely serrulate. Leaflets 5–9, simple or the lower ones bifid; linear but slightly broader in the middle, gradually tapering to a short hard point; lower leaflet up to 30 cm long, 6 mm wide at base, 9 mm at middle; smooth, with very fine grooves, midrib scarcely evident.

Stem 80 cm or more tall, stout, ribbed. Bracts borne on most of its length, the lower ones sterile, yellow, smooth; sheaths long and narrow, lower ones 80 mm long, 13 mm wide at base, 9 mm at top, thin, smooth; stipules narrow, 2 mm wide; leaflet single, far exceeding the stipules, up to 220 mm long and 4 mm wide, with acicular tips. Male compound umbels much longer than the bract sheaths, bearing flowers at the base and on the upper half, on short peduncles; bracteoles narrow linear, longer than the flower pedicels. Female compound umbels longer than the male, up to 150 mm long, three or four times the length of the bract sheath,

ultimate umbels crowded, with short pedicels. Bracts subtending the branches of the female compound umbels up to 30 mm long, consisting of a sheath and simple limb; bracteoles linear, as long as the fruit and its stalk.

Type from Swampy Hill, Otago, collected by W. R. B. Oliver, in Dominion Museum.

A. aurea falls into the group containing *A. colensoi* and *A. scott-thomsoni,* and is characterised by the bipinnate leaves, and leaflets 10–16 mm wide, with serrulate margins. It differs from the other two species of the group in the narrower bract sheaths and very long, narrow, leaf-like stipules.

DISTRIBUTION. South Island east of the area of high rainfall. Marlborough: Mt. Stokes (*Turner,* AM; *Hay,* BD; *McMahon,* CM). Upper Awatere (*Allan,* BD). Woodside Gorge (*Oliver*). Clarence Valley (*Haast,* CM; *Kirk,* DM). Amuri (*Kirk,* DM). Nelson: Mt. Luna (*Mason,* BD). Anatoki Range (*Mason,* BD). Four Peaks Range (*Mason,* BD). St. Arnaud Range (*Cheeseman,* AM; *Oliver,* DM; *Zotov,* BD). Canterbury: Mt. Isobel (*Oliver*). Torlesse Range (*Oliver; Petrie,* DM). Upper Poulter (*Cockayne,* DM). Upper Waimakariri (*Kirk,* DM). Kowai River (*Armstrong,* CM). Rakaia Gorge (*Oliver*). Upper Rakaia, no stipules (*Mason,* BD). Otago: Kurow (*Oliver*). Swampy Hill (*Oliver*). Maniototo Plain (*Petrie,* DM). Balclutha (*Petrie,* CM). Ben Lomond (*Oliver*). Waterfall Creek, Lake Te Anau (*Philipson*).

Aciphylla colensoi Hook. f., Handb. N.Z. Flora, 92, 1864.

Type from Ruahine Mountains in Kew Herbarium. *A. colensoi* var. *conspicua* Kirk, Stud. Fl. N.Z., 207, 1899. Type from Ruahine Mountains in Dominion Museum. (Plate 6, Fig. 2.)

The name *colensoi* has been applied to at least three species as recognised in this revision. Here it is restricted to the common North Island plant which is found as well in the northern portion of the South Island. Practically all published accounts involve more than one species. *A. colensoi* as here accepted has rather short leaves with broad sheaths and dagger-like stipules about as long as the petiole. Sometimes the stipules are double from the base, one point being much shorter than the other. In the specimen from Upper Rakaia the stipules are wanting, instead the top of the sheath is expanded There are three or four pairs of leaflets, the lowest one being trifoliolate. The lower leaflets are about 20 cm long and 12 mm wide. The midrib is prominent and usually reddish in colour. The leaflet margins are obscurely serrulate. The stem is stout and ribbed; bracts moderately broad, ribbed; lower ones about 60 mm long and 20 mm wide at base; stipules short, dagger-like; lamina pinnate; upper bracts trifoliolate, including the stipules; all segments with serrulate margins and acicular tips.

A. colensoi is very close to *A. scott-thomsonii.* It differs in its much smaller size in all its parts, more strongly serrulate margins to the leaflets, more prominent midrib, shorter petioles and shorter internodes in the leaves. The leaves of *A. colensoi* from the top of the petioles are from 30 to 50 cm long, whereas in *A. scott-thomsonii* they are up to 1 m long.

DISTRIBUTION. Mountain districts from East Cape in the North Island to North Canterbury, in the South Island. North Island: Mt. Hikurangi (*Moore & Cranwell,* AM; *Oliver,* DM). Ruahine Range (*Colenso,* Kew Herb., type; Druce, BD). Oroua River, Ruahine Range (*Howlett* DM, type of var. *conspicua;* AM, co-type). Mt. Hector (*Atwood,* AM; *Oliver*). Mt. Holdsworth (*Heine,* DM; *Oliver*). South Island: Marlborough: Clarence Valley (*Haast,* CM). Molesworth (*Chisholm,* BD). Walkers Pass (*Cockayne,* AM). Nelson: Mt. Kelvin (*Townson*). Mt. Murchison (*Townson,* AM). Spencer Mountains (*Mason,* BD). Mt. Zetland (*Mason,* BD). Canterbury: Lewis Pass (*Simpson,* BD). Upper Rakaia (*Mason,* BD).

Aciphylla scott-thomsonii Ckne. & Allan, Trans. N.Z. Inst., 57, 49, 1927.

Type from Mt. Maungatua in Botany Division (D.S.I.R.) *A. colensoi* var. *maxima* Kirk, Stud. Fl. N.Z , 207, 1899. Type from Arthurs Pass in Dominion Museum (male and female inflorescence). *A. maxima* (Kirk) Ckne., Veg. N.Z , 427, 1928. (Plate 1, Fig. 3.)

This magnificent species is the tallest and stoutest of the genus Its leaves reach a length of 120 cm or more, and the stem 2 m or more and 6 cm or more in diameter at the base. Cheeseman gives the length of the leaves as up to 5 feet, the stem up to 10 feet, and the diameter of the stem at the base up to 4 inches. *A. scott-thomsonii* is closely related to *A. colensoi.* It differs in its much larger size; leaves of paler colour, being more glaucous and with less

redness in the midrib; serrulations on the margins and midrib of the leaflets less evident; and thinner leaflets with less prominent midrib. Cockayne and Allan state that the midrib is more prominent in *A. scott-thomsonii* than in *A. colensoi* so evidently the comparison was made with *A. aurea* as here described, and not with the true *A. colensoi.*

Leaf sheaths up to 50 mm wide at top; lower leaf segments 38 cm by 20 mm to 45 cm by 15 mm; bract sheath length 105, width at bottom 22, at top 14 mm; central leaflet of bracts up to 325 mm long.

In the Awakino Valley, near Kurow, I discovered a plant bearing three stems, two of them being bifurcate, the other one branched into three.

DISTRIBUTION. Hilly and mountainous districts of Canterbury and Otago. Canterbury: Torlesse Range (*Simpson & Thomson,* BD; *Oliver*). Ben More (*Oliver*). Selwyn Gorge (*Oliver*). Arthurs Pass (*Cockayne*). Two Thumb Range (*Mason,* BD). Mt. Cook (*Haast,* CM). Otago: Kirkliston Range (*Oliver*). Rangitaipo (*Petrie,* DM). Ben Lomond (*Zotov,* BD). Swampy Hill (*Oliver*). Maungatua (*W. A. Thomson,* DM; *J. S. Thomson,* BD, type). Upper Hollyford (*Oliver*). Doubtful Sound (*W. A. Thomson,* DM).

Aciphylla ferox n.sp.

Affinis *A. horrida* a qua differt foliolis rectis, acutis; sipulis brevioribus; vaginis bracteorum longioribus, segmentis angustioribus. (Plate 8, Figs. 2, 3.)

Folia pinnata, vaginis usque ad 30 mm latis apice; stipulis brevibus, 15–25 mm longis; petiolis supra convexibus, striatis, marginibus levis; foliolis 2–4-jugis, usque ad 150 mm longis, 17 mm latis, rectis, striatis. Caulis robustus, costatus. Bracteae numerosae, inferne steriles; semi-verticillatae, trifoliolate vel simplices; segmentis terminalibus usque ad 18 mm longis, 3–8 mm latis.

Leaves pinnate, 2–4 pairs of leaflets; sheath broad, about 30 mm wide at top; smooth, with a few striae at the sides; yellowish green with yellow margins; stipules very short, dagger-like, about 15 x 4 mm; petiole slightly convex above, finely striate, margins smooth, yellow, length about 8 cm, width at middle 15 mm. Leaflets broad and straight, acute, all ending about the same level, finely striate, lowest about 150 x 17 mm, no midrib.

Stem stout, ribbed. Bracts numerous, the lowest sterile; semi-whorled; mostly trifoliolate counting in the stipules, the uppermost with simple laminae and no stipules; sheaths rather narrow and long, tapering, margins smooth, about 80 mm long, 13 mm wide at base, 6 mm at top; stipules narrow linear, 40 x 1½ mm; central leaflet narrow, up to 180 mm long and 3–8 mm wide. Compound umbels 1-1½ times the length of the sheath

Type from Mt. Arthur Plateau, collected by J. S. Thomson, in Botany Division, D.S.I.R.

Like *A. horrida,* this species has broad leaflets, but they are straight or nearly so, whereas in *A. horrida* they are strongly curved; also they leave the petiole at a wider angle than in *A. horrida.* The tips of the leaflets are not so gradually narrowed as they are in *A. horrida.* The stipules in *A. ferox* are much shorter than in *A. horrida,* being only about 15 mm long. Compared with *A. horrida* the bract sheaths are absolutely longer and narrower; the stipules are narrower; and the central leaflet is narrow throughout, while in *A. horrida* it is much wider and the middle is conspicuously wider than the base The two species form a distinct group distinguished by the broad leaflets and the central segment of the bracts being simple.

DISTRIBUTION. Mountainous districts of Marlborough and Nelson. Marlborough: Bounds, 1,500 m (*Martin,* DM). Woodside Creek (*J. S. Thomson,* BD). Nelson: Mt. Arthur Plateau (*Heine,* DM; *Martin,* BD; *J. S. Thomson,* BD; type). Anatoki Range (*Mason,* BD). Mt. Luna (*Mason,* BD). Haupiri Ridge (*Hay,* BD). Head of Baton River (*Oliver*).

Aciphylla horrida n.sp.

Folia pinnata, 5–7-foliolata, usque ad 80 cm longa; vaginis apice 50 mm latis; stipulis usque ad 25 cm longis; petiolis latis basi, usque ad 25 mm latis; foliolatis lanceolatis, concavo-convexis, striatis, marginibus serrulatis, usque ad 40 cm longis, 30 mm latis. (Plate 5, Fig. 3.)

Caulis robustus, costatus, usque ad 1½ m altus. Bracteae numerosae, inferne steriles; vaginis brevibus, latis, usque ad 55 mm longis, basi 35 mm latis; stipulis latis, usque ad 75 mm longis; lamina simplice, lanceolato, usque ad 185 mm longo, 13 mm lato. Umbellae compositae quam vaginae bracteorum duplo longiores.

Leaves about 80 cm long, forming a dense impenetrable mass about 1½ m in diameter at the base of the stem, pinnate with usually two pairs of leaflets and a terminal one; in a specimen from Arthurs Pass there are three pairs of leaflets and a terminal one; sheath about 50 mm wide at the top; stipules simple, dagger-like, 10–13 cm long, more than half the length of the

petiole, in a specimen from Takahe Valley the stipules are longer than the petiole, one of them 245 x 15 mm with a smaller branch 150 x 10 mm; petiole broad, striate, up to 20 cm long and 25 mm wide at base; leaflets narrow, lanceolate, curved, the convex side outwards, broadest at the middle, finely and evenly striate, without midrib, base strongly ridged below, dark green with yellow serrulate margins, all ending about the same level, the lowest pair longest and widest, length of lowest pair of leaflets from Alecs Knob, 40 cm, width at base 14, at middle 30 mm.

Stems 1–3 on each plant, stout, coarsely ribbed, about 1½ m tall, bearing flowers over most of their length. Inflorescence a large, broad, obtusely pointed and densely flowered panicle. Bracts numerous, lowest sterile; sheaths of lower bracts short and broad, length 55 mm, width at base 35, at top 20 mm, ribbed with smooth margins; stipules rather broad, tapering, with prominent midrib, 75 x 7 mm; leaflet simple, broadest at middle, 185 x 13 mm, width at base 8 mm; upper bracts progressively smaller but only a few of the very top ones without stipules. Male compound umbels twice as long as the bract sheath, copiously branched, with long slender peduncles to the ultimate umbellules; bracteoles linear lanceolate. longer than the stamens. Female compound umbels about twice the length of the bract sheaths, branching at the base and in the upper half; rachis stout, ribbed; peduncles up to 30 mm long, bearing at the ends dense clusters of fruits on short pedicels; carpels, one with two, the other with three broad wings.

Type from Alecs Knob, above Franz Josef Glacier, collected by W. R. B. Oliver, in Dominion Museum.

Aciphylla horrida stands close to *A. ferox* in its rather short leaves with broad veinless leaflets, but the distinctive features of *A. horrida* are the curved leaflets, usually only two pairs, the long stipules, sometimes longer than the petioles, and the wide sheaths, stipules and central leaflets of the bracts. These features contrast with the species of the *colenso* group with their spreading leaves of narrow segments of different lengths and the pinnate laminae of the bracts. There are only a few specimens of *A. horrida* in herbaria perhaps because of the difficulty of gathering leaves or flower heads from this well armed species.

DISTRIBUTION. South Island, on mountains in the area of high rainfall. Nelson: Mt. Kelvin (*Townson,* AM). Westland: Mt. Rangi Taipo (*Cockayne,* DM). Walkers Pass (*Cockayne,* AM; *Wall,* CM). Alecs Knob, Franz Josef (*Oliver,* DM, type; *Wood,* AM). Canterbury: Arthurs Pass (*Kirk,* DM; *Cheeseman,* AM). Otago: Ben Lomond (*Zotov,* BD; *Oliver*). Humboldt Mountains (*J. S. Thomson,* BD). Takahe Valley, Murchison Range (*Oliver*). Mary Peaks, Caswell Sound (*Poole,* BD).

DR. W. R. B. OLIVER, F.R.S.N.Z.,
26 Ventnor Street,
Seatoun,
Wellington, E.5.