(γ.) *The Tussock Form.*

The tussock form plays no great part in Stewart Island; still, it is important in the subalpine scrub, where the great moplike green heads of *Gahnia procera* are raised on pear-shaped trunks 20 in. high, and measuring 8½ in. in diameter at the base and 13 in. at the summit, built out of the decay of leaves, stems, &c. Peat forming and utilising is indeed an important characteristic of many of the plants. The leaves of the cushion plants decay and build up masses of peat within the cushions, into which the young shoots of the periphery send down short roots. The peat acts both as a water-reservoir and a food. Leaf-bases in *Celmisia*, *Aciphylla*, various grasses and sedges, *Astelia*, &c., remain decaying and decayed round the bases of the living leaves, equalling them in bulk.

(δ.) *The Yucca Form.*

The yucca form, shown by one section of the genus *Aciphylla*, is not of moment in Stewart Island, being represented by *A. Traillii* alone, which is likewise, under certain conditions of the soil, &c., of cushion habit. That most anomalous grass, *Danthonia pungens*, may also perhaps be classed here. It forms large patches of tufted culms, varying in size and length of leaves, which may be a foot or more or only a few inches long. The leaves are not erect, but incline at an angle to the ground. They are very stiff and coriaceous, flexible, pale-green in colour, marked with brown, ⅜ in. broad at the base in large specimens, and taper gradually to an extremely sharp and pungent apex. The blade is much incurved and striated, and waxy upon the upper surface. The leaf-sheaths remain attached to the plant, slowly rotting, and hold much moisture. The roots are stout and wiry.

(ε.) *The Large-leaved Plants.*

The large-leaved plants so characteristic of the New Zealand subantarctic islands are represented by the punui (*Stilbocarpa Lyallii*), and perhaps *Ranunculus Lyallii* and *Aciphylla intermedia* may be included here. *Stilbocarpa Lyallii* is a striking plant, with large, thin, shining bright-green leaves, orbicular-reniform in shape, 1 ft. or more across, somewhat resembling those of a vegetable-marrow. The petioles are 2 ft. or more long, hollow, tapering, and arise from small rhizomes marked with old leaf-scars, and furnished with long, thick, rather woody roots. These rhizomes are connected together by stout, hollow stolons, which arch above the ground, and are 2–2½ ft. in length, and by means of which the plant can increase enormously. When a growing stolon has reached a certain length, a young plant will be developed from its extremity which will possess two or three leaves before the young rhizome bent to the ground by the arching of the stolon shall have taken root. Great colonies are formed in this manner, covering many square yards of ground, the stolons passing in some instances beneath rocks, so that plants far distant from one another are still actually in connection. The small purple flowers on large compound umbels equal or are just hidden by the leaves (see Photo No. 38).

Other noteworthy plants of this section are dealt with when treating of the formations.

(ζ.) *Leaves.*

The leaves of the bog and subalpine meadow-plants are very various: most are thick and coriaceous, some are tomentose, generally they are small. A few brief notes may be given as to the leaf-anatomy of some of the specially southern or characteristic plants. *Ranunculus Kirkii*, a plant of wet ground, has a hygrophytic structure, with its thin-walled, large epidermal cells, raised stomata, 1-celled palisade, and pneumatic tissue. *Aciphylla flabellata*, of rock-crevices, is xerophytic, with a strong cuticle to both surfaces, 5-layered palisade, and close pneumatic tissue. *A. Traillii* has the middle third of the leaf composed of open pneumatic tissue, a 3-rowed dense palisade to both surfaces, small epidermal cells, sunken stomata on both surfaces, and much stereome. *Celmisia rigida* has a strong cuticle on the upper surface, large epidermal cells with thickened inner walls, 2-layered palisade, and open pneumatic tissue. *Ehrharta Thomsoni* has strong cuticle, close chlorenchyma of rounded cells divided regularly by bands of stereome, and on under-surface from epidermis several cells side by side arranged fanlike at regular intervals, and reaching to the centre of the chlorenchyma. *Crassula moschata* has a thin-walled epidermis, 1-layered palisade, and rest of leaf a close tissue of roundish cells, many of which are colourless. *Celmisia linearis* has strong stereome, 2-layered palisade, strong cuticle. *Abrotanella muscosa* a close chlorenchyma of roundish cells and thick-walled epidermis on both surfaces. *Ourisia Colensoi*(?) has a typical dorsi-ventral leaf. *Geranium sessiliflorum*, although growing on sand-dunes, has stomata on both surfaces, and is generally of a mesophytic structure. *Liparophyllum Gunnii* has a palisade of roundish cells 2–4 deep round periphery of leaf, but remainder of interior is of loose pneumatic tissue. *Forstera sedifolia* var. *oculata* has a strong cuticle to both surfaces, 2-layered palisade of smallish cells, and large epidermal cells. *Myosotis albida* has thin-walled epidermis, 2-layered palisade, open pneumatic tissue—not at all the structure for a coastal rock-plant. *Ranunculus Lyallii* has slightly raised stomata on both surfaces, 2-layered palisade, open pneumatic tissue, and thin outer epidermal cells. *Donatia novae-zelandiae* has the pneumatic tissue in centre of leaf, close palisade round periphery, strong cuticle, and much-thickened epidermal walls. *Astelia linearis* has slightly cuticularised epidermis, subepidermal water-tissue, rest of leaf close roundish-celled chlorenchyma. *Gnaphalium trinerve* has large-celled upper epidermis with cuticle, layer of large cells without much chlorophyll in centre of leaf and air-spaces, and below this smaller-celled tissue with abundance of chlorophyll. *Plantago triandra* var. *Hamiltonii* has slightly cuticularised epidermis, 2-layered palisade, stomata both surfaces, rather close round-celled pneumatic tissue. *Danthonia pungens* has a strong cuticle on upper surface, subepidermal row of colourless cells, stomata in the furrows, close chlorenchyma of round cells, strong stereome at margin of leaf. *Stilbocarpa Lyallii* has very large thin-walled upper epidermal cells, 2-layered palisade of short cells, roundish-celled pneumatic tissue. *Caltha novae-zelandiae* has cuticularised epidermis, stomata on upper surface, 2-layered palisade of long cells. *Veronica Laingii** has ordinary structure of

* Although a shrub, mentioned here since it is a meadow-plant.