



# Mt Snowden, Northwest Nelson\*

*Judith Petterson, Palmerston North*

Mt Snowden stands apart, a great block of mountain as seen on the western skyline from the Takaka Hill Road. It forms a high-sided peninsula separated from the surrounding ranges by the forking of the Waingaro River, but linked by narrow ridges at its western end with the Douglas and Lockett Ranges. It is one of the highest mountains in the Tasman Ranges, its highest point, Kakapo Peak (5804 ft), being topped only by Mt Arthur, the Twins, and Devil River Peak.

According to the Geological Map of Golden Bay (1st ed., Sheet 13, 1961) Mt Snowden is composed of "Devil River Volanics" at its eastern end (coarse volcanic conglomerates, andesite and basaltic tuffs), with a change to grey, green and red volcanic sandstones and siltstones at the western end, the strata apparently nearly vertical. (These sediments are thought to have originated from the erosion of ancient volcanoes.)

Anatoki Peak, four miles north of Snowden, shows up for miles around as a jagged sawtooth ridge of nearly vertical strata, with a steep slope up the eastern face, undercut to the west. Its principal serrations have been aptly named "Dragon's Teeth" and "Trident" in the 1968 Topographical Map. Another four miles to the north are the granite mountains Lead Hill and Mt Olympus.

An outcropping of marble is visible as a series of narrow white ridges running north-south and parallel to one another, from the western slope of Kakapo Peak to the western slope of Mt Benson, cutting across intervening spurs and valleys. Where it crosses the Cobb Valley its presence is indicated by sinkholes in the flat grassy valley floor, and it broadens to form practically the whole of Mt Mytton. In places (e.g. near Trilobite Hut) it is full of tiny fossil trilobites, or fragments of them, transformed without distortion into dark-grey crystalline marble. These are the oldest fossil-bearing rocks known at present in New Zealand, and the trilobites set their age at Cambrian Period.

Serpentine, talc-magnesite and asbestos outcrop in the lower Cobb area, while Iron Hill and Mt Lockett are largely composed of beautiful coarse dark conglomerate, probably the same as that

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\*Note: Most species named in this article are represented by numbered specimens in the Massey University Herbarium. Specimens of most of the species mentioned in our earlier article on the Heaphy Track (*Bull. Wellington bot. Soc.* 35, 1968) are now also in the Massey Herbarium. Colour transparencies illustrating the features discussed here and in the following article on Lake Cobb proved unsuitable for publication.

on Snowden (which I have not seen), and almost certainly the same as that of Paton's Rocks on the coast at Puramahoi, which I have seen.

This astonishing variety of rocks and minerals gives the mountains of Northwest Nelson enormous interest, both from a geological point of view, and because of the richness and endemism of the flora. It is possible that certain species of plants may be indicators of the mineralogical nature of the rocks. Certainly the whole nature of the plant association varies with the rock type, but more because of the ways the different rocks weather to provide different types of habitat (associated also with altitude), than from their chemical nature. The serpentine-asbestos flora, however, is strongly affected by the chemical nature of the substrate, and deserves intensive study.

After dreaming about Snowden for several years, Tony Druce, Graham and I set off in January, 1958 with a week's supply of food and many *Listeners* for pressing plants in. We started up the Killdevil spur from Riordan's farm, Uruwhenua, with Mr Laurie Riordan and two horses to carry our gear up and over the first steep ridge. On N.Z.M.S. Sheet S.8, 2nd.Ed., 1968, our starting point was 201623, at the end of the short blind road.

We climbed the steep ascent between Killdevil Creek and Sam Creek, zig-zagging up that long hot spur, thankful not to be carrying packs; three thousand feet of altitude in two miles, according to the maps. Plants of interest noted on the way up were the grasses *Deyeuxia avenoides*, *Notodanthonia clavata*, *N. gracilis* and *N. penicillata*, and the orchids *Aporostylis bifolia*, *Caladenia lyallii*, *Thelymitra ixioides* and *T. pachyphylla*, also the tiny-flowered *Haloragis micrantha*.

We noticed very fine-grained white limestone near the foot of the hill, then shale, then limestone again. This white limestone is hard and porous, contrasting with a softer limestone found higher up, which was yellowish when freshly broken, the grey weathered surfaces pitted and dimpled. On the Geological Map (under "Mt Arthur Marbles") is a note ". . . better preserved corals, crinoids and graptolites have recently been found . . . 1½ miles west of Upper Takaka. The corals and crinoids are in a limestone band and the graptolites in a closely associated shale band." Undoubtedly we were climbing over the same formations.

From the summit, the Killdevil Ridge drops away in a great rocky bluff, covered in scrub but almost sheer for 2000 ft, to the river below. We looked across this great gulf to the slopes of the Devil Range, known locally as the Snow Plain, a gently sloping skyline ridge where the snow lies for long periods, making it a conspicuous landmark from the Takaka Valley and also from the Takaka Hill road.

We turned left, following a clear track through scrub. The eastward slopes here, part of the watershed for the Takaka River, were washed bare of soil — just greasy clay with flow-marks where the recent rains poured off as soon as they hit the ground. Occasional small patches of yellowish soil showed up under large rocks and the sparse clumps of blighted manuka which formed the only plant life. This is in contrast to the dense covering of native grasses and subalpine scrub Graham recalls 16 years earlier, and is the direct result of an outmoded farming policy of frequent burning followed by overstocking. No wonder the river floods so often.

The track we were following led us down to the river. It was much used for packhorses during the old goldmining days. In places it is very steep, and Mr Riordan told us comforting tales of heavily laden horses slipping over the edge to crash into the river below. However, we arrived uneventfully at Skeet's Creek four hours after leaving the farm (two hours up, two hours down). Here we entered the forest, pleasant going for us but quite difficult for the horses, with steep steps down and a narrow track. After 12 years I retain a clear impression of a densely-canopied forest with sweetly-smelling mossy floor, and a variety of divaricating shrubs in the more open places.

Nearly an hour from Skeet's Creek we came to a pleasant area of manuka floored with bright green *Schizeilema microphylla*. Graham remembers this from 16 years earlier as a bracken-clad clearing which accounts for its name, Fern Spur. Forest had been burned there many years previously. Possibly by now, if protected from further burning, it will be regenerating. Here we relieved the horses of their loads, bade farewell to Mr Riordan, and continued along the forest track to Waingaro Forks. Taking it easily, watching deer and discussing plants, it took three hours from Fern Spur to the Forks. It does not look far on the map, but the track winds about a great deal.

The Waingaro river was thigh-deep and swift. We crossed above the Forks with the aid of a long pole, which we all held, and a staff each; and shortly after came upon a small hut in reasonable repair, though pretty dirty. As we still had two hours of daylight on our side, we continued up the south bank of the Stanley river for about an hour, crossing a sliding scree then scrambling through forest parallel to the river, keeping high to avoid bluffs. No track marked here. We came out at last to Hansen's Flat, where we set up camp. Pleasant surroundings, with a lovely river plain dotted with silver beech trees and divaricating coprosmas.

Up to this time we had noted and collected the following nine species of divaricating shrubs:

*Coprosma microcarpa* (92)  
*C. banksii* (98)  
*C. linariifolia* (99)  
*C. propinqua* (88)  
*C. parviflora* (93)

*C. polymorpha* (95, 96)  
*Myrsine divaricata*  
*Neomyrtus pedunculata* (89)  
*Pseudopanax anomalum* (94, 97)

Ferns collected in the forest included *Blechnum vulcanicum*, *B. minus* and *B. patersonii*, and on the riverbed we collected three epilobiums, *E. microphyllum*, *E. nerteroides* and *E. pubens*.

An early start next morning soon brought us to where the river bed was full of huge tumbled rocks which had fallen from an old slip scarring the face of Mt Snowden, high on our left. This "Little Slip" came down during the Murchison earthquake of 1929. The moraine-like debris, now well settled, had smooth places between the rocks carpeted completely with bright green *Raoulia glabra*, with white spongy lichens for contrast. Here we found *Ophioglossum coriaceum*, the tiny "adder's tongue" fern, each plant with one fleshy green leaf and one yellow cone-like spike. The rocks were coated and painted with crustose lichens of many kinds and colours, reds, greys, and whites.

We clambered over and round these enormous angular blocks for what seemed like miles, crossing the river twice, before seeing the Big Slip ahead. The Big Slip comes right from the top of Mt Snowden, and the debris from it is piled up in the valley and runs up the other side — quite a landslide it must have been. The river became a lake, now called Lake Stanley, which still fills the valley above the great dam. The stream comes from it in a series of rapids and is cutting quickly through the dam. We saw talus slopes with fresh new rock debris all along the course of the stream, contrasting with the weathered rock of the dam.

Although it was 30 years after the Murchison earthquake when we were there, the dam had little vegetation; the debris was evidently on the move continually, though imperceptibly. There was a little regrowth forest near the base of the slip where it was more stable, but the slip face itself was steep naked rock. The Little Slip was much more stable, with its lichen-coated rocks and the verges clothed in second-growth forest, mainly young beeches up to six inches in diameter.\*

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\*My diary describes the material from the slips as "mainly greywacke and grey hard shale, some quartz". The 1961 Geological Map shows, in the area where the slips came down, a narrow strip of "thin-bedded grey and green argillites with trilobite limestone lenses" lying between areas of "massive and bedded green andesites and basaltic tuffs". It seems to show the Big Slip as a creek running diagonally across these formations, but is not easy to interpret as the lake proportions do not match those on the new 1968 topographical map. Had we access to such a good geological map at the time we would have taken a greater interest in the rock types, and would recommend anyone tramping in this area to take rock samples at intervals with a view to checking the map.

It took us four hours from Hansen's Flat to cross both slips — three miles as the kea flies. This was easily the most arduous part of the whole journey, lightened though it was by botany and scenery. Lake Stanley at the time was unnamed (and not shown on the 1948 map), and was still known locally as "Wattie's Run", in memory of the green valley, now submerged, where cattle were brought for fattening in the old days. Near the lake we added another couple to our bag of divaricating coprosmas — *C. ciliata* (similar to *parviflora*, but hairy-leaved) and *C. rugosa* (blue berries and pink stems, stiffly divaricating).

One of our mentors had said: "Go straight up through the bush on the upper side of the dam and you'll be out in the open in half an hour". It took us an hour and a half — very hard going at first, steep and pushing through scrub. Higher up the scrub was left behind and there was bare forest floor, still very steep. The forest was of giant kanuka trees (*Leptospermum ericoides*), with trunks 18 inches in diameter, perfectly straight and tall. Such a forest could only be second growth following an old fire. It would be interesting to find out, by ring-counts, just how old these trees are. The man who pioneered cattle-grazing in these mountains was John Salisbury, who first brought cattle to the Cobb Valley in 1875.\* Others followed his example, and fires lit accidentally or deliberately by white men date from around this time. Anything earlier points to Maori exploration, of which little or nothing is known in this area.

Above the kanuka forest was a slope densely covered in mountain flax (*Phormium cookianum*) and burnt logs. Ground cover was mainly sorrel and other exotic weeds, but the following small native species were collected:

<i>Cyathodes fraseri</i> (285)	<i>Geranium microphyllum</i> (294)
<i>Drapetes villosa</i> (290)	<i>Gnaphalium traversii</i> (289)
<i>Epilobium alsinoides</i> (292)	<i>Chionochloa australis</i> (287)
<i>Gaultheria crassa</i>	<i>Poa colensoi</i> (286)
<i>G. depressa</i>	

Most of these are common as pioneers following fire.

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\*Salisbury brought cattle from the Motueka district by way of the Graham and Flora Valleys to grazing country on the Tableland, thence to the broad valley of the Cobb, and from there up and over the Ruby Saddle into the Ruby Valley and on to the Waingaro and Stanley Valleys. The opening up of this country, and the adventurous methods of drafting and droving, are well described in C. B. Brereton's book "*No Roll of Drums*" (Reed, 1947). Having no drafting yards, a method of selecting out fat cattle from the rest of the herd was to drive them all into a boggy cirque where they floundered belly-deep in the mud. This slowed the cattle down sufficiently for the boys to leap in among them, twist the tails of those they wanted, and chase them out with much hullooming and hilarity. A favoured place for this operation was a bog at the foot of Mt. Lockett, close to Diamond Lake. Brereton says: "It was as strenuous a job as could be imagined but we enjoyed it as much as town boys do a game of football."

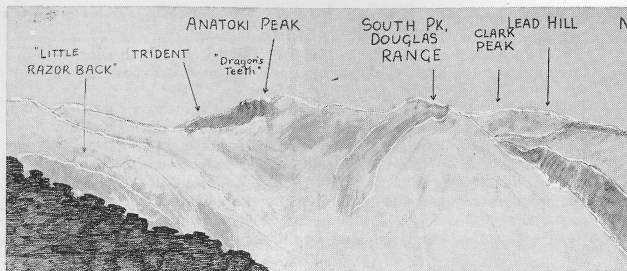


Fig. 2.—Panorama of mountains seen

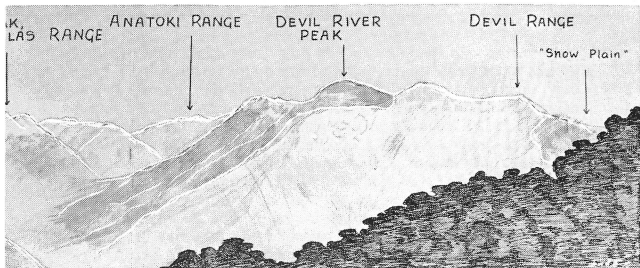
Above the flax face was a remnant of forest, and then we were out on the tops — pathetically burnt bare of vegetation with all ground cover gone or dead except for a few straggling dracophyllum shrubs.

Graham went up to the rocky knob, stalking deer with a camera. He startled seven young ones among the summit rocks, and came back with two scree plants: *Notothlaspi australe* flowering, and a small greyish moss-like cushion of *Parahebe cheesemanii*. The altitude for these would be between 4500 and 5000 ft, and the rock (according to the map) should have been either andesite or conglomerate, being close to the line of the Haupiri Thrust.

We picked a campsite further west on the northern face of the mountain, at the bushline, with mountain beech trees (*Nothofagus solandri* var. *cliffortioides*) and celery pine bushes (*Phyllocladus alpinus*) in front of us, and the steep slope to the summit behind. Here the slope was most densely clothed in vegetation, showing what the other should have been like. Big snow-tussocks (*Chionochloa flavescens*) formed the dominant cover — every tussock varying in width of leaves. Then there were broad slippery patches of hassock grass (*Chionochloa australis*), clumps of mountain flax, two species of dracophyllum (*D. longifolium* and *D. uniflorum*), *Copma pseudocuneata* and, far too frequently for our comfort, great

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\*Graham's grandfather, J. W. L. Petterson, had told us of this type of kakapo sign. He had climbed in these mountains a great deal in his younger days, and had seen kakapos which used to be common here. He also described the clear tracks, like deer tracks, made by these big birds, with sliding places to which they apparently returned time and time again for the pleasure of sliding down. Dr. M. F. Soper, in *New Zealand Bird Portraits* (Whitcombe and Tombs, 1963), describes a different type of sign as follows: "(The Kakapo) has a characteristic method of chewing leaves, particularly the leaves of snow tussock, which provides a reliable indication of its presence in an area. The leaf instead of being detached from the plant is chewed *in situ* until all the juice is extracted. The remaining macerated material is left hanging on the plant where, with the passage of time, it dries and bleaches and becomes very conspicuous. Although deer



snowden camp, looking north and west.

spiky, glaucous masses of the Spaniard *Aciphylla squarrosa*. This species, the largest of the Spaniards, is the most ferocious of all those found in the Tasman Mountains, having 5-spined bracts on its huge flowering stems, each spine pointing in a different direction, and each with a needle-sharp point. *A. ferox*, in comparison, is quite mild.

While cutting tussock for bedding, Graham found a large nest made of dried grass, hidden under a snow-tussock. It lacked eggs, and probably belonged to a weka. We kept a sharp look-out all the time for kakapo "sign" (chewed stringy leaf-bases on torn-out tussock leaves), but found none. We did see stringy leaftips, but attributed these to deer.\*

We spent the following morning collecting plant specimens up the slope and along the summit ridge. Snow started to fall, lightly at first but later so heavily, driven horizontally by a biting wind, that we returned in haste to our camp. Visibility was poor, but we found our way back by recognizing plants from which we had taken specimens.

Later, when the snow ceased, we prowled around in the drizzle collecting plants from the lower slopes. Notable finds were *Anisotome filifolium*, with leaves divided into a few long slender filiform segments, and tiny umbels of minute white flowers — an

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will often chew the leaves in the same way, especially the leaves of *Celmisias*, there is no mistaking the deer chewings for the tightly-bunched, densely entangled fibres left on a plant by a Kakapo."

With increasing interest in the possibility of finding Kakapos in the remoter regions of N.W. Nelson, both these descriptions should be borne in mind. Possibly the chewed leaf-bases belong to *Aciphylla* rather than snow-tussock (at least it has juicy bases). Dr. Soper has pointed out that kakapo cannot co-exist with deer, as they compete for the same food, so search could only be successful in areas where the deer have not yet penetrated — if any such exist in N.W. Nelson. Deer were first released in Nelson in 1854 and in the Takaka area a few years later, and have spread practically throughout the Tasman Mountains.

almost invisible plant; *Taraxacum magellanicum*, looking remarkably like a common dandelion; and *Ranunculus insignis* with its huge glossy rounded leaves and glorious large yellow buttercup flowers. On large rocks near the bushline perched the tiny ferns *Grammitis billardieri* and *G. ciliata*, and at higher altitudes *G. pumila*, all three very much alike with their simple strap-shaped fronds differing only in size and hairiness. Grasses found among the tussocks were *Hierochloa fraseri*, *Poa kirkii* and tiny *Poa breviglumis*.

We saw a rock-wren — a very small, plump, short-tailed bird, bobbing up and down continually on its oversized feet, and fluttering in and out among the tumbled rocks of the mountain top which form the only known habitation of this species. Dr Soper thinks rock wrens probably overwinter in the cracks and crannies deep among these rocks, beneath the blanket of snow, as there have been no reports of their being seen within the forest even in winter. An inquisitive weka inspected our camp while I was pressing plants, and scurried off gleefully with a plastic bag. It came back several times for more loot, its liking for shiny things overcoming its wariness.

We had a little trouble determining the altitude. The first day at our bushline camp the barometer had registered 4200 ft. The next morning, before the snow, the altitude was 5200 ft (tectonic upheaval during the night). The third day, we awoke to find snow all around, and the altitude at 4000 ft. This we considered probably correct. I sketched what mountains were visible before it came on to rain again (Fig. 2). My diary is full of rueful comments on the food supply, which was running low, and the shortage of warm clothing. We debated whether to go over Kakapo Peak to the mountains at the head of the Cobb, and walk out the full length of the Cobb Valley, or to take the shorter route via Falling River, Ruby Valley, Iron Hill, Lake Sylvester and the Cobb Dam. Tops were all clouded over and snowy, and we could not see our route, so we had to stay put meantime.

Graham found *Hebe ciliolata* in flower in a rock crevice about 5000 ft — snowy white flowers against deep green foliage arranged in four neat rows on small stems. He went up a boulder fan to the great cliffs above and found masses of *Ranunculus insignis*, also *Cheesemanian gibbsii* with gleaming white flowers and small narrow leaves sprouting from a stout carrot-like root. (New record for this.) The silky-leaved prostrate *Pimelea oreophila* was in full flower, also *Euphrasia monroi* and a large-flowered *Hebe*, probably *H. canterburyensis*, with leaves distichously arranged.

Next day (6th) dawned fine and sunny, so we packed up and took off for Kakapo Peak. There is a deep dip down to a saddle at the head of Falling River, where the beech-forest just reaches the ridge. At the prospect of a series of formidable steep rocky peaks ahead we left our packs in the saddle and continued un-

burdened, collecting plants and photos. Looking back from a rocky knoll we could see for the first time the south face of Snowden, all slips and scree.

We followed well-marked deer tracks which sidle around the peaks, and after three peaks came to a small tarn in a grassy basin, pleasant and windless with a good view of the mountains all around. Graham, who went to investigate the routes beyond Kakapo Peak, reported innumerable deer tracks forming "practically a highway" from Kakapo Peak to Anatoki Peak, from which it is possible to follow the Anatoki River out to Takaka, although there are some bad slips which have partly destroyed the old pack track used by gold miners. This track is shown on the 1968 map. He also reported a clear route via a spur from Kakapo Peak directly to the head of the Cobb Valley. (See following article on Lake Cobb.)

We returned to Falling River saddle, collected packs and slithered down the scree to the red-tussock basin glowing golden in the sunlight below. Every rock we passed had *Cheeseman* seedlings on it, also *Celmisia traversii* seedlings. (These species are practically eaten out on the ridge tops.) Deer and goats browsing in the red-tussock clearing made off in haste at our arrival, and disappeared into the surrounding forest.

We followed the stream through beech scrub and clearings, losing altitude steadily. Towards the Waingaro it became steep with many waterfalls (hence the name Falling River), which meant a lot of scrambling for us. Finally we reached and crossed the Waingaro, only a small stream here, and camped in tall beech forest.

After sharing breakfast with a bush robin, we left the Waingaro and followed the Ruby Valley. Pleasant going through beech scrub, red tussock and bogs on a gentle up-grade for about five hours. This was the route taken by the cattle drovers in the 1870s, and the broad flat valley still offers plenty of grazing (Fig. 3). Near the saddle where Ruby Creek peters out and Diamond Creek begins, we came across a few plants of *Discaria toumatou* (tumatukuru or Wild Irishman, as they call it in Canterbury, where it is a common inhabitant of dry tussock-grassland). It was the first I had seen in the Tasman ranges, and grew tall and spindly here. Perhaps the cattle brought it. We also noted *Pittosporum colensoi*, small trees on the margins of islands of beech trees in a sea of red tussock, the green orchid *Pterostylis venosa*, and hummocky masses of *Rubus schmidelioides*.

By this time it was raining hard again, and visibility was poor. We saw Diamond Lake, a charming small lake flanked by forest and margined with tussock. Near here must be the bog where the cattle were drafted. We climbed above the lake into the clouds, higher and higher as more peaks loomed through the mist, and could not see below at all. Then Lake Lillie came into sight, a small circular lake in the open tussock-land, with its outlet stream run-

ning back through the tussocks towards Diamond Stream. We knew then that we were on Iron Hill. We climbed over conglomerate rocks, great squared blocks broken off the crags, very beautiful with a wealth of shrubs growing among them. The vegetation here was entirely different from that found elsewhere, being rich in species not found at all on Snowden, and also being undamaged by deer or fire. *Senecio adamsii*, *Senecio bidwillii* var. *viridis* and *Podocarpus nivalis* were dominant shrubs, with *Traversia baccharoides* occasional. In places between the rocks we found *Myosotis macrantha* with its remarkable long deep-brown flowers, and *Celmisia lateralis*, neither found elsewhere on this expedition. There are two forms of the *Celmisia*, the commonest green and glabrous, the rarer one glaucous and glandular-hairy. The latter fits the description of "var. *villosa*", but may be merely a sporadic variant in this area. *Caltha novae-zelandiae*, whose flowers are described as "yellow" in the *Flora of N.Z.*, here has translucent straw-coloured flowers with a deep-red vein in each petal. We found *Aristotelia fruticosa* in flower and in fruit—the flowers exactly like those of *A. serrata*, but single and sessile instead of in great hanging bunches. *Hebe albicans*, suddenly so common in modern pebble-gardens in Palmerston North, is "at home" on Iron Hill, with its broad greyish-white glabrous leaves and dense spikes of pure white flowers with striking purple stamens. Likewise *Hebe topiaria*, neat as though clipped, with even rounded shape and small neat elliptic grey-green leaves, is as decorative in its native habitat among the conglomerate rocks and herbfield as it is in a city garden. The whipcord *Hebe coarctata* is another little friend from this region

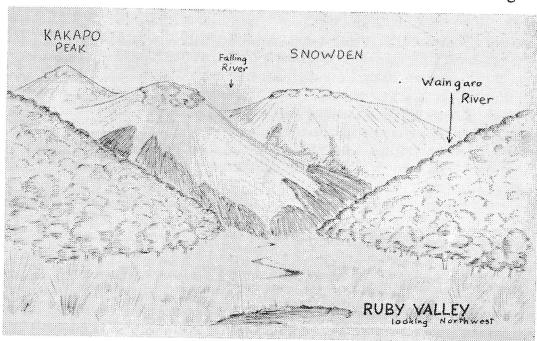


Fig. 3.—Ruby Valley, looking north-west.

which adds its yellow-green "fronds" to shop-front rockeries, and thrives amid the noise and bustle of the town as happily as at 5000 ft on Iron Hill. Another attractive species, which has not yet found popularity but surely will some day, is *Hebe vernicosa*, which is found in a pink-flowered form on Iron Hill, as well as the usual white-flowered version. *Hebe pauciramosa* var. *masonae*, also from this area and all over the Tasman Mountains, turns up in the most unexpected places — as an indoor tub plant, for instance. However, *Hebe ciliolata*, *H. haastii* and *H. recurva*, three very choice species, seem unhappy away from their rugged mountain conditions and usually perish from mildew in my garden, although they thrive when clinging precariously to a rock crevice at nearly 6000 ft.

It took us about two hours to climb over Iron Hill, again going higher and higher in the mist to avoid unknown hazards hidden below, until we saw Iron Lake and made our way down to it. Then a sidling walk down to the two Sylvester Lakes over slippery hassock grass soon brought us to civilisation in the form of a road and a lot of exotic weeds. *Juncus pallidus*, a tall thick reed, and *J. lampocarpus*, a small one, occupied a shallow ditch beside the road.

Lake Sylvester, a small lake filling a rocky corrie with its outlet stream tumbling down a nearly-vertical slope to the Cobb river 2000 ft below, has been dammed to deepen it. In times of drought, water used to be siphoned over the dam to pour down its own outlet creek to add to the flow in the Cobb to keep the power-house running. Little Sylvester, being at a slightly higher level, was used to replenish Lake Sylvester as required. Pipes, concrete some huts and a formed road are evidence of these activities of the 1940s and 1950s. The two huts in the bush have been taken over by the Forestry Dept., and we were thankful to find they were not locked, and well stocked with firewood. We soon had two great iron stoves going and were getting warm and dry and fed.

Next morning was bright and clear, rain all gone, mountains beautiful, a wonderful view of Mt Arthur to the south. After replenishing the firewood supply we returned to Iron Hill to make as complete a species list as possible in a few hours.

The southern end of Iron Hill bears a conspicuous smooth reddish patch, visible for miles. This proved to be a semi-consolidated scree of rust-stained rock debris, with very little plant life. *Haastia sinclairii* was present in the less stable slopes of this scree, while *Aciphylla polita*, *Hebe haastii*, *H. ciliolata* and *Epilobium margaretae* were found in the more stable parts, although absent from the surrounding tussock land. *Celmisia bellidifolia*, a lovely little plant with densely petalled white flowers and small glossy bright green leaves, was found only on wet rocks in the bluffs at the back of the lake. A large *celmisia*, which I have earlier referred

to *C. monroi* (*Bull. Wellington bot. Soc.* 28, p.19, 1956) is perhaps better referred to *C. coriacea* var. *lancifolia*. It seems to be endemic to the Tasman Mts, and is rather like *C. coriacea* except that the flowers are no more than two inches in diameter and the leaves are flaccid and leaden grey on the top surface instead of stiff and silvery.

Separate species lists are given in the appendix for Mt Snowden and for Iron Hill and Lake Sylvester, to show the difference in vegetation.

On the way down to the Cobb Dam from Lake Sylvester we found *Rubus parvus* in the forest — a small trailing species lacking barbs and bearing large, raspberry-like fruits, nice to look at but flavourless. On the Cobb Ridge (south-east of the dam) we inspected our old friend *Pittosporum dallii* and found it in full flower, also *P. patulum* (not flowering) — both rare trees and now regarded by the powers-that-be as valued specimens to be preserved.

The Cobb Ridge is a very rewarding place botanically. Despite roads, and the machinery that occupied the summit area for several years in the 1940s and 50s while the dam was being built, the vegetation is a good example of herbfield and subalpine scrub, rich in species, with the bushline just reaching the ridge on the south-east flank. One can step from a natural rock-garden full of gentians, celmisias, bluebells and heath-like species, into a moss-floored forest of beech trees with orchids of several species and many different mosses — all easy of access by roads and as yet practically unspoiled.

A gentian which used to carpet the whole of the valley floor before the Cobb Reservoir was formed is still to be found around the margins of both sides of the dam. It is biennial or perennial in habit, i.e., one finds young unbranched specimens and older thick-stemmed specimens with many branches from the base, all flowering at the same time. The flowers are white with pink or mauve veins, sometimes very showy. I have usually referred this to *G. serotina* or *G. montana* var. *stolonifera*, but it may be an unnamed species. As far as we know it is found only in the Cobb Valley, still carpeting the valley floor in the upper reaches. A superficially similar species, differing in the calyx characters, is *G. tenuifolia* which is found on the scrubby flats and slopes around the reservoir. Further study is needed to clarify the separation of these two species. Species collected on Cobb Ridge or at the Cobb Reservoir are listed below.

<i>Acaena novae-zelandiae</i> (134)	<i>Libertia pulchella</i> (145)
<i>Celmisia dallii</i> (135)	<i>Olearia X arborescens</i> (298)
<i>C. spectabilis</i> var. <i>angustifolia</i> (115,131)	<i>O. avicenniaefolia</i> X (141)
<i>Cyathodes empetrifolia</i> (114, 297)	<i>Pittosporum dallii</i> (55)
<i>Gentiana</i> sp. "a" (Cobb Ridge) (133, 140)	<i>Pterostylis australis</i> (172)
	<i>Rubus parvus</i> (106, 186)
	<i>Schoenus</i> sp. ( <i>pauciflorus</i> agg.) (in forest) (185)

FLORA OF MT SNOWDEN

Numbers refer to specimens in the herbarium of Massey University (MPN). Species which still lack satisfactory classification are marked\*. Dominant species are marked (D).

PLANTS COLLECTED ON SNOWDEN SUMMIT, FROM BIG SLIP TO KAKAPO PEAK, 4000- 5000 FT ALT.

SHRUBS

- Coprosma depressa*  
*C. pumila* (244)  
*C. parviflora* var. *dumosa*\* (256)  
*C. pseudocuneata* (217)  
*Dracophyllum uniflorum* (257)  
*Gaultheria crassa* (283)  
*G. depressa* (201)  
*Hebe canterburiensis* (25, 27, 160, 225)  
*H. eitiolata* (164)  
*H. coarctata* (28)  
*H. epacridea* (248)  
*H. haastii* (30, 228)  
*H. pauciramosa* var. *masonae* (26, 159)  
*Myrzine nummularia* (242)  
*Pimelea oreophila* (237, 249)

GRASSES

- Chionochloa australis* (287) (D)  
*C. flavescens* (17) (D)  
*Hierochloa fraseri* (255)  
*Petriella colensoi* (119) ca. 5000 ft.  
*Poa breviglumis* (288)  
*P. colensoi* (286)  
*P. kirkii* (269)  
*Trisetum cheesemanii* (250, 259) ca. 5000 ft

SEDGES, RUSHES AND REEDS

- Prasophyllum colensoi* (280)  
*Pterostylis venosa* (197)  
*Uncinia filiformis* (in bog)

DICOT HERBS

- Acaena* sp.\* (260) (summit rocks)  
*Aciphylla ferox*  
*A. monroi*\* (84)  
*A. polita* X *monroi*?\* (234)  
*A. squarrosa* (D)  
*Anisotome aromatica*\* (85) (small form)  
*A. deltoidea* (284)  
*A. filifolia* (251)  
*A. haastii* (226)  
*Cardamine* sp. (*debilis* agg.) (233, 282) (tny green cushion).  
*Celmisia allanii*  
*C. alpina* (117, 180)  
*C. coriacea* var. *lancifolia*\* (277) (= *C. flaccida* Ckn?)  
*C. discolor*\* (264) (D)
- C. laricifolia* (227)  
*C. spectabilis* var. *angustifolia* (137, 143) (D)  
*C. traversii*  
*Cheesemanii gibbsii* (147) (on rocks, 5000 ft)  
*Colobanthus acicularis* (266) on rocks, 4-4500 ft)  
*C. affinis* (265) (on rocks, 4-4500 ft)  
*C. canaliculatus* (267) (on rocks, 4-4500 ft)  
*C. masonae* (24, 219, 232, 236) (ca. 5000 ft)  
*Cotula pyrethriifolia* (235)  
*Craspedia minor* (279) (in bog, 4000 ft)  
*Drosera arcturi* (191) (in bog, 4000 ft)  
*Epilobium glabellum* (215, 262)  
*E. pycnostachyum* (240)  
*Euphrasia monroi* (263)  
*Gentiana patula* (129, 275)  
*Gingidium decipiens* (*Anisotome petraea*) (195)  
*Geum leiospermum* (149)  
*Haastia sinclairii* (231) (screes only)  
*Leucogenes grandiceps* (192)  
*Myosotis petiolata* (82, 127, 247)  
*M. pygmaea* var. *drucei* (loose debris at 5000 ft)  
*M. traversii* (139, 211)  
*Notothlaspi australe* (118, 193, 268) (screes only)  
*Ourisia caespitosa* var. *caespitosa* (148)  
*O. macrophylla* var. *lactea* (171)  
*O. sessiliflora* var. *simpsonii* (212)  
*Parahebe cheesemanii* (29, 162) (screes)  
*Plantago novae-zelandiae* (196, 245)  
*P. uniflora* (198)  
*Ranunculus insignis* (100)  
*R. lappaceus* "multiscapus" group\* (146)  
*Raoulia grandiflora* (238)  
*R. rubra*  
*Schizilema haastii* (230, 229)  
*Scleranthus uniflorus* (246, 293)  
*Taraxacum magellanicum* (81)  
*Wahlenbergia pygmaea* var. *laxa*\* (295)

PLANTS COLLECTED ON IRON HILL AND LAKE SYLVESTER,  
4000 - 5500 FT ALT.

SHRUBS

- Archeria traversii*  
*Aristotelia fruticosa* (169, 202)  
*Cassinia vauvilliersii* (182)  
*Coprosma depressa* (203)  
*Cyathodes empetrifolia* (114, 297)  
*Dacrydium laxifolium*  
*Dracophyllum filifolium* (136)  
*Gaultheria colensoi* (205)  
*G. depressa* (13)  
*Hebe albicans*  
*H. coarctata* (5)  
*H. ciliolata* (on red scree)  
*H. haastii* (on red scree)  
*H. macrantha*  
*H. pauciramosa* var. *masonae*  
*H. topiaria* (57)  
*H. vernicosa* (white and pink fls)  
*Pentachondra pumila*  
*Pimelea oreophila* (179)  
*Pittosporum anomalum*  
*Podocarpus nivalis* (D on conglomerate)  
*Senecio adamsii* (D on conglomerate)  
*Senecio bidwillii* var. *viridis* (D on conglomerate)  
*Traversia baccharoides*

GRASSES

- Chionochloa australis* (D around lake on slopes)  
*C. flavescens* (D on spurs)  
*C. rubra* (D in swampy flats)  
*Deyeuxia setifolia* (181)  
*Notodanthonia setifolia*  
*Poa colensoi*

SEDGES, RUSHES AND REEDS

- Carex acicularis* (774)  
*C. sinclairii*  
*C. stellulata* (7)  
*Gaimardia setacea* (22) (in bog)  
*Calorophus minor* (*Hypolaena lateriflora*) (D in bog by lake)  
*Juncus articulatus* (*J. lampocarpus*)  
*J. pallidus*  
*Luzula* sp.\*  
*Oreobolus pectinatus* (D in bog)  
*Scirpus aucklandicus* (21, 213) (in water)  
*S. merrillii*  
*Uncinia ferruginea* (16, 87)  
*U. filiformis* (214)

OTHER MONOCOT HERBS

- Astelia cockaynei* (15)  
*A. graminea* (178, 252)  
*Bulbinella hookeri*

DICOT HERBS

- Acaena anserinaefolia* var. *sericeinitens* (14, 126)  
*A. novae-zelandiae* (134)  
*Aciphylla anomala* (187)  
*A. polita* (4, 176)  
*Anisotome aromatica*\* (132) (tall form)  
*A. aromatica* var. *aromatica*?\* (189) (dwarf form in bog)  
*A. deltoidea* (19) (in turf in bog)  
*Brachycome sinclairii* var.\* (20, 23)  
*Cardamine* sp. (*debilis* agg.)\* (276) (tall and diffuse, in bog)  
*Celmisia alphina* (180, 117)  
*C. bellidifolia* (found only where water trickles over rock faces)  
*C. coriacea* var. *lancifolia* \* (5)  
*C. dallii* (117)  
*C. discolor*  
*C. hieracifolia*  
*C. lateralis* (6)  
*C. lateralis* var. *villosa*\* (308)  
*C. sessiliflora* (253)  
*C. spectabilis* var. *augustifolia* (3)  
*C. traversii*  
*Donatia novae-zelandiae*  
*Drapetes laxus* (184, 204)  
*D. villosus* (183)  
*Drosera arcturi*  
*Epilobium margaretae* (10) (red scree)  
*E. pernitens*  
*E. rubromarginatum* (Nelson variant) (121, 170, 190)  
*Euphrasia townsonii* (11)  
*Gentiana* "bellidifolia" agg.\*  
*G. vernicosa*  
*Gnaphalium traversii*  
*Huastia sinclairii* (red scree)  
*Hebe ciliolata* (red scree)  
*Hebe haastie* (red scree)  
*Helichrysum bellidioides*  
*Lagenophora* sp.\* (123)  
*Myosotis macrantha* (9)  
*Nertera balfouriana*  
*Ourisia macrophylla* var. *lactea* (8, 120)  
*Plantago uniflora*  
*Ranunculus clivalis* (*geraniifolius*)  
*Raoulia glabra*  
*R. lutescens* (only on Little Sylvester Dam; introduced to this area?)  
*Viola cunninghamii*  
*Wahlenbergia pygmaea* var. *laxa*\*