Lucy Cranwell Lecture 2004 – Introduction

Ewen K Cameron

W (Bill) R Sykes grew up in the County of Suffolk in East Anglia in the small village of Wyverstone in the northern part of the County. It is thanks to Bill's mother that we can understand him, because apart from her (she strongly disliked the local tongue), most people in that area spoke with a strong East Anglian dialect! His interest in botany and ecology started early because at primary school there was an annual competition involving the first time each wildflower was brought in flower to school. Just before the summer holidays a prize went to the person who had accumulated the most of these records. When Bill left and went to the area school at Stowmarket it was obvious to him that a certain area of roadside cutting that he cycled past each day supported different species to what he saw in the neighbourhood of Wyverstone. The addition of these chalk species meant that he enabled his sister to top the competition for a year or two.

Bill started work by training in horticulture at the internationally-known seed nursery of Thompson and Morgan in Ipswich. After about two years he had to do two years of compulsory military service as a medical technician in the Royal Navy, but he had to work in shore-based establishments in the British Isles and so didn't see the world as a sailor. Probably the most boring time of his life although the first aid learned was useful and it was during this time that he was properly introduced to the microscope, mainly to make slide preparations of disease-causing bacteria.

He began serious horticultural training at the Royal Horticultural Society's Wisley Gardens in 1949 as a student and after successfully completing the Wisley Diploma Course in 1951 he went on and obtained the National Diploma in Horticulture (NDH) in 1953. Meanwhile in 1952 and 1954 Bill represented the Royal Horticultural Society on British Museum (Natural History) organised expeditions to unknown biological areas of the Himalaya in western (1952) and central (1954) Nepal. For most of the time Bill's main task was to collection herbarium specimens, although he also enjoyed collecting insects and even a few birds and snakes for the Museum scientists to study. Near the end of the trip live plants and seed was collected, but Bill became very ill during his first trip and had to return home at the end of the monsoon just before the final live plant trip. But on the second trip Bill lasted the full 9 months and thoroughly enjoyed it as well as avoiding the dysentery.

1957 he married Betty who also worked at Wisley where she and one other person ran the seed exchange which involved collecting and sending seeds all over the world to members of the Royal Horticultural Society. Immediately after this he left Wisley and went to the Chelsea College of Science of London University where he gained a degree in Biology in 1960. However, he already realised that although having higher horticultural qualifications than much better practical gardeners that he knew, he really was not cut out to be a practical horticulturist. So the following year he came to New Zealand at the invitation of Eric Godley at Botany Division who, after discussions with Arthur Healy, thought that someone who knew something about introduced plants could be a useful addition. Arthur, as well as Margaret Simpson (nee Bulfin), being the only people around at Botany Division at that time who knew many introduced plants, particularly the cultivated ones that they wanted Bill to study.

Why New Zealand? Well, Bill decided that he wanted to emigrate to where he could see plants growing naturally because if he had taken the job offered at Kew to work on tropical African plants there was little chance of doing that at that time. There were no vacancies for taxonomic botanists in Australia or New Guinea then either, these being two countries that he investigated. He decided against working for a PhD in North America, couldn't stand the thought of working in the then land of apartheid, South Africa, and didn't think that he could get a job on the Continent of Europe. But his first choice was to work in the Edinburgh's Royal Botanic Gardens Herbarium because this was a world centre for studies of Himalayan plants and he was very influenced by his two trips to Nepal. However, there were no vacancies there at that time. By then he had even written a few small more or less horticultural articles on Himalayan plants.

At Botany Division Bill began by studying the cultivated plants, limiting himself to the woody species. Unfortunately the only published fruit of that exercise can be seen in: "Studies of Cultivated Plants in NZ". No. 1. Bignoniaceae, published by DISR in 1966, because this was the first and last publication in this series. This was because other interests and demands took over. Thus in 1964 the Director of Botany Division, Eric Godley, had been asked to suggest a botanist to join the Royal Ornithological Society of NZ expedition to the Kermadec Islands to mark their 25th birthday. Bob Cooper had been first choice (he'd been there in 1956), Ian Atkinson second (he was otherwise engaged) and Bill third. So Bob and Ian turned down the offer and Bill went, but managed only 2.5 days on Raoul Island (the main and only inhabited island of the Kermadec Islands) because the volcano forming the main part of the island erupted two days after their camp was established. So the navy ship that took the Expedition there received a mayday call as it headed back to Auckland and was ordered to return to Raoul as quickly as possible and take them off.

Meanwhile to the north the agricultural authority on Niue was keen to develop a cattle industry and wanted to know what poisonous plants they had. So in the following year, 1965, Bill spent 10 weeks there collecting and documenting their flora – published in 1970 as a DSIR bulletin titled "Contributions to the Flora of Niue".

In February 1966 his son Julian was born. Also in this year Bill joined the Wildlife Service trip to eradicate the goats on Macauley Island in the Southern Kermadecs. Later that year the Ornithological trip to Raoul was successfully reconstituted with Don Merton as leader, and Bill was able to spend 10 weeks there, as well as visiting the adjacent Herald Islets.

During 1969, 1970 and 1974 further visits were made to the Kermadecs, completing landings on all the islands and islets except the precipitous West Chanter. Bill's daughter Claire was borne in 1970 but he and Betty separated nearly two years later. In 1974 Bill joined a DSIR Soil Bureau trip to the southern Cook Islands; he was invited along to tell them what was on top of their soil pits that they were busily excavating. But the first part of this journey was separate from the main trip because he joined the Cook Bicentenary Expedition to Palmerston Atoll to celebrate the bicentenary of Cook's landing on this northernmost island of the Southern Cooks.

1975 saw Bill back to Niue for a short while and also he returned to Rarotonga with Soil Bureau scientists to impart the knowledge gained on the previous trip to staff in the Agricultural Department of the Cook Islands. In 1977 he joined the Royal Society of NZ trip to Tonga and Fiji. Bill spent most of his time on 'Eua studying and collecting mainly ferns, his paper on them was published in the same year. That year also saw his Kermadec Islands Flora published as a DSIR bulletin.

1978 Bill tried to get to 'Ata, the most southern island of Tonga, with an American Peace Corp worker who had worked with him on 'Eua, and when permission proved too difficult to obtain they went instead to Late in northern Tonga. This is an uninhabited volcanic island west of Vava'u that looks like a tropical version of Rangitoto. His paper was published on its vegetation in 1981. Also in 1978 saw the first of a series of Checklists by Colin Webb, Bill and Phil Garnock-Jones, published on the naturalised conifers and dicots in NZ with Patrick Brownsey contributing the naturalised pteridophytes. This culminated in 1988 as Vol. IV of the Flora of NZ, which had tied up the 3 major authors for more than a decade. Note – having Bill speaking tonight completes the trifecta for Lucy Cranwell speakers.

In the winter of 1982 I was fortunate enough to join Bill in a 3-week trip to the Cook Islands, taking Rhys Gardner's place as he had badly cut his leg. This was a wonderful introduction for me to the tropical botany of the Pacific, visiting Rarotonga, Miti'aro and Ma'uke Islands, and the start of a close friendship which has continued since that time.

1988 with his contribution to Flora Vol. IV finished Bill worked in China on the conifers of Guangxi Province there, followed by further studies on them in Russia and the British Isles, being away for 9 months. The results were published a couple of years later.

1992 he was able to visit the Society and Austral groups in French Polynesia for the first time collecting extensively with Jacques Florence, then at ORSTOM, Papeete and brushing up his very rusty French a little. He officially 'retired' when DSIR became extinct a little later that year (but this appears to have made little difference to what he does).

1993 Bill married Peggy from Ireland but then almost immediately took off to the atolls of the Northern Cooks while she went home to Ireland. However, later that year they both went to the Chatham Islands for their delayed honeymoon. Because of work commitments Peggy had to return after a week, and Bill therefore extended his stay because he hadn't had enough time to botanise this island group which was new to him.

1994 sees us almost back where we started, because exactly 40 years after his last trip to the Himalaya, Bill returned as a specialist guide for Footprint Tours of Nelson, this being the first of six such trips, two of which he added on a journey into Tibet.

Bill has had several other trips to the Cook Islands and is still toiling away on its Flora which I know will be a very scholarly piece of work based on 3 decades of study. Most revealing is Bill's choice of topics tonight; he weighed up the Cooks versus the Himalaya and decided on the latter, perhaps reflecting his first taste of truly exciting field work and in a region that still fires him up? As well as his knowledge of the Pacific flora Bill is also the recognised authority of cultivated plants in the Polynesian region. Bill has wide interests and knowledge and is a regular contributor to the local newspapers, usually on international political topics far removed from the gentle science of botany.

This lecture series is named in honour of Lucy Cranwell (1907-2000), who amongst other positions was the Museum botanist here from 1929-1944 and the Auckland Botanical Society's only patron. She specialised in Gondwanan pollen which earned her international recognition. She also had affection for the NZ algae. Neither of these strengths is shared by tonight's speaker who admits to being quite ignorant of these botanical fields that made her so well-known. Lucy maintained a strong connection with the Auckland Botanical Society and Bill has joined the Society on at least three trips: Mayor Island, Raoul

Island and in January this year we roped him into our South Island trip to Lake Ohau. Members all enjoyed Bill's knowledge of plants that he shared with us so patiently. Lucy's 2nd formal publication was on the Flora of Manihiki, a moderate-sized atoll of the northern Cooks that was visited by Bill in 1993. This paper was based on specimens sent to her by Mr A. M. Linton of the Lands & Survey Department. Later Lucy did some field work in the upland bogs of Hawai'i. Also she had a love of the northern NZ mountain-top floras which she surveyed with her close friend and botanist the other Lucy, namely Lucy Moore. Those of you who have been in the field with Bill will know that he loves nothing better than to climb to the top of and botanise any peak that he comes near. And we mustn't forget that the Himalaya has a Gondwanic connection, being formed by Peninsular India migrating to the north and coming up against the main part of Asia to form the great Himalayan Range! Therefore I'm sure Lucy would strongly approve of our guest lecturer tonight, and I warmly welcome Bill Sykes who will speak tonight on one of his treasured areas: "Himalayan Alpine Plants".

Lucy Cranwell Lecture 2004 – Himalayan Alpine Plants

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Introduction

The main Himalayan range runs roughly from northwest to southeast for over 2000 km. This great region is influenced by the two monsoons bearing rain from the Arabian Sea and the Bay of Bengal. The amount of monsoon rainfall decreases to the west and the amount of winter rainfall and snow melt increases, but the overall figures of precipitation increases greatly towards the east. In contrast to this gradual decrease of precipitation to the west the contrast between the southern and southern sides of the main Himalayan range is often sudden and dramatic. This is because the lee or northern side of the mountains is usually in the monsoon rain shadow and very dry. This does not apply nearly as strongly to the high alpine region between about 4300 and 6000m because the short growing season after the snow melts means that the ground is moist whether on the southern or northern side of the main crest of the Himalayan Range. In this area grow the low mat-forming and cushion-shaped plants that are the traditional typical alpines that many people (especially in Northern Europe) think of by this term, but I am also using the word in a wider sense to include plants generally that grow above the tree line. This is a very variable factor depending mainly on altitude and aspect but can apply almost anywhere between about 2500 and 4500m when conditions are right. A great range of open habitats is included in this large region with rocky river beds, cliffs, ridges, screes, moraines, fellfield, as well as short grazed pastures forming alpine meadows supporting a great variety of plants.

Of course several countries share this great area, but the part dealt with in this short article is the same as that covered by my slides for the Lucy Cranwell lecture, ie. the central region of Nepal with adjacent parts of Tibet just to the north. Of course, most of the latter country is above 3000m and relatively dry as compared to areas south of the Himalaya but it grades into a Central Asian steppe flora further beyond its mountain southern boundary. A few river valleys bisect the main Himalayan range and this dramatic contrast between the southern and northern sides is illustrated very well by going up the quite short distances from one side to the other. One of the best examples is the great Kali Gandaki Valley in Central Nepal. Also in East Nepal there is a big contrast between the Nepalese southern side of the Mt Everest area and the Tibetan northern side. This difference in rainfall is the main reason influencing the plant life of the alpine region and this is very well shown in these two areas. Although most of Nepal is on the southern side of the Himalaya, considerable areas in the western half of the country are behind the main range and mention of the Annapurna and Mustang areas below usually means areas on the northern side.

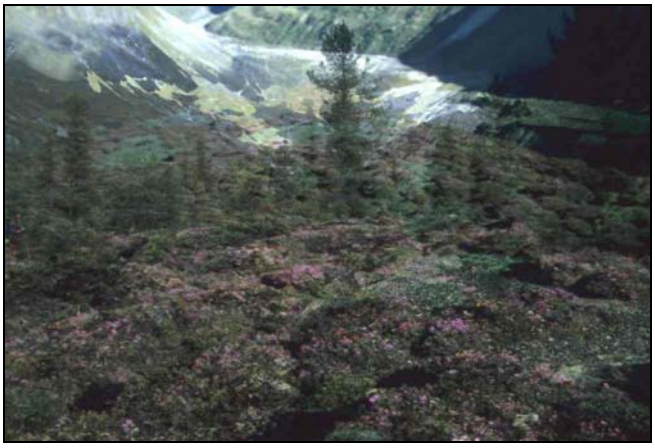
Rhododendron and Primulaceae

The genus most associated with the Himalaya is probably *Rhododendron* in the Ericaceae and for very good reasons. There are tree species that extend down to the subtropical zone and small alpine shrubs that occur up to *c*. 6000m. As in the case of many other Himalayan genera the number of species increases to the east and conversely many dry areas to the north lack rhododendrons. On the other hand, in the second family Primulaceae, there are species of high alpine zone *Primula* on the northern or Tibetan side, although admittedly they often grow in snow-melt flushes that provide high moisture conditions. In the related genus *Androsace* there are some species on the northern side in similar habitats but a few species also grow a little lower down in very dry conditions distant from underground moisture. A very good example is *A. tapete,* plants of which look like small vegetable sheep on the dry barren shaly slopes leading up to the Pang La (Pass) north of Everest between 4,500 and 5.000 m. Some of these high alpine *Androsace* species that form tight silvery or woolly mats could be mistaken for species of *Saxifraga* when not in flower. This very well-known, but unrelated, genus is also well-represented in the high alpine region. Species of *Androsace* and *Primula* are

present in nearly all the alpine region, sometimes in such great abundance that the ground appears carpeted by them.

***Rhododendron anthopogon*, *R. lepidotum*, *R. setosum* Nepal, Solu Khumbu, near Maccherma (1 July 1995).**

***Androsace tapete* (Primulaceae). Southern Tibet, near confluence of Tingri and Pang Valleys (16 May 1999).**



***Androsace muscoidea* var. *longiscapa* & *Saxifraga* ? *andersonii*. *Pinus wallichiana* and *Juniperus squamata* in background Nepal, just below Annapurna main ridge and above Marsiandi Valley (20 June 1996).**

Asteraceae

Such silvery cushions or mats also occur in genera of the Asteraceae. Thus there are a number of species in different genera of this family that have this habit, a few looking like balls of cotton wool. This is a reflection on the severe climate and inhospitable habitat that they grow in, especially screes, moraines and even on the glacial debris on top of a glacier itself. Such life forms inevitably evoke comparisons with alpine regions in New Zealand because Asteraceae is often the dominant family in such habitats here also. A good example is the similarity between *Leucogenes*, New Zealand edelweiss, and *Leontopodium*, Himalayan as well as European edelweiss. However, their tribes are different. Also in a tribe well-known in the adventive flora here, namely the Cardueae or thistle tribe, there are species of *Saussurea* that are very high alpine or glacier inhabiting plants in Nepal looking like balls of cotton wool with small holes in for pollinating insects to reach the flowers inside. At lower altitudes there are other species of this genus lacking the hairy covering and looking much more like respectable thistles. Another Himalayan high alpine that readily comes to mind is related to European lowland plants that are adventive or cultivated in New Zealand. This is in the genus *Tanacetum*, tansy, where there the high alpine species forms small silvery tufts growing on screes and moraines in Nepal.

Miscellaneous high alpines

Turning to three other families there is firstly a species of Lamiaceae on screes and moraines in the high alpine zone with a woolly white covering that superficially obscures its relationships. Thus *Eriophyton hookeri* is a small hobbit-like plant but when one pushes its dense indumentum aside and examines the flowers it is quickly obvious that it is closely related to the genus *Stachys*. In the Brassicaceae the Northern Hemisphere genus *Thlaspi* has scree species that have a very similar growth habit to our *Notothlaspi* species in the same family. It may come as a surprise to find the family Araceae present in the alpine zone but *Arisaema flava* is a small plant of rather dry rocky places, often being present in heavily grazed areas in the middle of the alpine zone on the northern side of the main range and up into Mustang. Otherwise this interesting genus with its great diversity of spathe and spadix form is concentrated in the lush temperate and subtropical forests in southern Nepal.

Between about 3000 and 4300m in Central Nepal the alpine zone on either side of the Annapurna Range shows a great contrast, made more striking because of the great wall that rises very steeply from low altitudes with resulting very heavy monsoon rains on the southern side behind Nepal's second city of Pokhara. The lush vegetation has many of the typical Himalayan alpine genera, including those mentioned already as well as *Meconopsis*, Himalayan poppies, *Gentiana*, *Anemone*, *Potentilla* and *Pedicularis* (louseworts) to name but a few. On the other hand, on the northern side of this range and still in Nepal the situation is very different.

Caragana brevispina **(Fabaceae). Nepal, upper Marsiandi Valley, 6 July 1996**

Leontopodium monocephalum **&** ***Waldheimia glabra*** **(both Asteraceae). Nepal, Solu Khumbu, on Nojumba Glacier, 12 July 1995**

Gentiana urnula**. Southern Tibet, Pang La (Pass),** ***c.*** **5100 m, 16 May 1999**

Sophora moorcroftiana **Southern Tibet, Tingri Valley, near road to Lhasa, 19 May 1999**

Saussurea simpsoniana **(Asteraceae). Nepal, Solu Khumbu, on Nojumba Glacier, 12 July 1995**

Stellera chamaejasme **Southern Tibet, confluence of Tingri and Pang Valleys, 16 May 1999**

Vegetation of the arid region

The Marsiandi Valley runs parallel to the Annapurna Range on its northern side and the main or central part of it is very dry with much more open vegetation than is seen on the southern side of the mountains. The flora there is mostly comprised of different genera let alone different species. Here the Fabaceae, legumes, are often as dominant as they are through much of southern Tibet. Amongst the several genera involved are species of *Caragana* that are often much in evidence with their spiny mounds somewhat reminiscent of gorse. That huge genus *Astragalus* is also represented here and I must mention *Sophora moorcroftiana* of course. This is also a spiny shrub but has blue flowers instead of the orange, reds or yellows of the other legumes, but like them it is much used for firewood in this almost treeless landscape. It is rather local although common where it does occur, this including the barren upper Kali Gandaki Valley in southern Mustang where the cold and dry up valley wind blows nearly every afternoon and evening throughout the year. Composites are present as in most places in Nepal and Tibet and the main genus of these dry zones is *Artemisia*, wormwoods. On the other hand the Chenopodiaceae is mainly a family of drier areas and species of genera like *Kraschenninnikovia* with their grey, semi-succulent leaves are more indicative of the Central Asian steppe flora.

Along the middle Marsiandi Valley four very different plants deserve a brief mention for different reasons. Firstly *Dicranostigma lactucoides* is a member of the Papaveraceae and replaces *Meconopsis* in these dry areas. It looks superficially like the *Glaucium flavum,* yellow horned poppy, that grows on the coast from Hawke's Bay to Otago. Secondly, although often common, *Thymus linearis* was a bit surprising to see, but I later saw this representative of a mainly Europe and West Asian genus growing even further east in Tibet. It is a typical creeping thyme such as people grow in their gardens here. *Myricaria rosea* is a small glaucous shrub with terminal spikes of rosy flowers in the Tamaricaceae. The species has the usual tiny scale leaves of tamarisks. Like some other genera mentioned here *Myricaria* is a characteristic genus of the Central and West Asian steppes but this species also sometimes grows in sand amongst rocks that are besides cold fast-flowing rivers in the Solu Khumbu district south of Mt Everest. Finally, what I think is my favourite plant of this dry region, *Stellera chamaejasme*. This is a clump-forming herb with a woody rootstock and slender shoots that have terminal umbels that cover their ends with fragrant white flowers that are crimson in bud. It belongs to the Thymelaeaceae and like species of *Daphne* is still sometimes used for making paper, at least in Tibet. But unlike this genus *Stellera* has no woody stems and therefore the only woody part are the roots below the surface. But where it grows there are no *Daphne* species.

The above plants comprise only a very small fraction of the beautiful and interesting alpines that grow in this high central region, and if I have given too much emphasis on the species of drier areas I have to offer the excuse that the northern side of the Himalaya is less well-known because it is more inaccessible.

Lucy Cranwell Grant Recipient– Decisions mothers make: Food availability and the maternal investment of hihi (*Notiomystis cincta*)

Rose Thorogood

Hihi are an endangered member of the honeyeater family (Melaphagidae) of birds. Aside from Little Barrier Island, the conservation of this species relies on introduced, managed populations on offshore islands. All populations other than the one remaining natural population on Little Barrier Island require food supplementation for the continued survival of the birds. However, the relationship between food source, habitat, and breeding success is one of the key areas that is still not understood, and is vital for the successful conservation of this species. Importantly, birds and forest do not exist in isolation; both require each other. For New Zealand's unique floral diversity to remain, an understanding of its relationship with pollinators is crucial. Therefore, to improve conservation of hihi and their environment, this research aimed to understand the relationship between maternal investment (and breeding productivity) and food availability using both a supplementary feeding experiment, and an assessment of the natural food supply and vegetation.

Tiritiri Matangi is an important restoration project, and is composed of a mix of remnant mature bush (kohekohe/taraire/pohutukawa) and replanted areas (puriri/*Cordyline*/mahoe). Hihi were introduced to Tiritiri in 1995 and 1996, and now occupy almost all catchments across the island. To understand the relationship between hihi and their environment, the vegetation composition of the territories occupied by hihi were characterized. Each territory within the four main catchments (Bush 1, 2, 21, and 22) was surveyed with ten random 5 x 5m plots. Vegetation was characterized by percentage cover, and by tier:

Groundcover (0 – 0.5m)
Shrub layer (0.5 – 2m)