

It would certainly appear in similar places further north. The Botany Division has now received a specimen collected in March 1967 at Akaroa by Mr. G. Collet and recently from the Canterbury Museum collection one collected on Ellesmere Spit in March 1921 by F.W. Hilgendorf and identified by Wall. J.B. Armstrong's herbarium shows specimens he collected in 1864 on Banks Peninsula and Governors Bay. R.M. Laing (Trans. N.Z. Inst. 51 1919) recorded L. anceps for Banks Peninsula at Island Bay and on coastal cliffs at Waikerikeri; and on the authority of A. Wall for Children's Bay (Akaroa) and the sea coast generally. Wall himself in his "Botany of Christchurch", in which he did not include Banks Peninsula other than the slopes of Lyttelton Harbour, mentions only Ellesmere Spit (probably referring to Hilgendorf's specimen) and Purau as localities. However, Dr. Colin Burrows in his lists for Kaitorete (Ellesmere) Spit in No's 2 and 3 of this Journal does not list L. anceps.

The kind of habitats shown for Botany Division specimens are: forest, open forest, forest track (dense forest is certainly not suitable), tuff, roadside bank, scrub, coastal rocks, cleared tea tree swamp, seepage on dune, sandy lake margin, Typha swamp, peat bog drain, hot springs, Phorminum - Cladium glomeratum swamp, and submerged in lake in unusually high water. It is very much at home on the coast and has been collected as high as 1200 ft in the Ruakakapatuna Valley, Wellington. One would have thought there would be suitable habitats enough in Canterbury but, although there are definite records the length of the west coast of the South Island to Chalky Inlet, on the east southward from Whites Bay in Marlborough through Canterbury, Otago and the plains and coast of Southland there seem to be no records except for Banks Peninsula, Ellesmere Spit and Oamaru. Any occurrences in the eastern South Island are therefore worth recording.

The familiar name Lobelia anceps is used here, but in the appendix to Allan's Flora it is pointed out that New Zealand specimens in 1953 were by Wimmer attributed to Lobelia alata var. alata.

THE FLORA OF RICCARTON BUSH

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We are revising the lists of native and adventive plants found in Riccarton Bush, an important, 12 hectare reserve of kahikatea forest and adjoining parkland, located in the Christchurch metropolitan area. In particular, we would like to compare the present flora with previous lists, and to use this information for future reserve management and for public interpretation such as "Nature Walk" pamphlets.

Riccarton Bush - often incorrectly called Deans Bush - has a long and interesting floristic record; one of the oldest, and possibly the most complete and continuous in the country. A brief summary of the published lists in chronological order follows (full references cited below):

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| 1870: | J.F. Armstrong | - | 94 native flowering plants and ferns;
20 mosses, lichens, fungi, etc.
6 adventive flowering plants. |
| 1906: | L. Cockayne | - | 67 native flowering plants and ferns. |

1923:	A. Wall	-	94 native flowering plants and ferns.
1924:	F.B. Murray	-	97 native flowering plants and ferns.
1950:	F.B. Murray	-	96 native flowering plants and ferns.
1959:	A.J. Healy	-	142 adventive flowering plants; 1 adventive fern.
1968:	F.B. Murray	-	98 native flowering plants and ferns.
1969:	A.J. Healy	-	142 adventive flowering plants; 1 adventive fern.
1972:	G.C. Kelly	-	59 native flowering plants and ferns; 5 adventive plants (troublesome weeds).

Of these, Armstrong's list is the most important because of its historic value, and because it is the first and only record of mosses, lichens and fungi for Riccarton Bush. Some of the species he recorded, e.g. miro (Podocarpus ferrugineus) and supplejack (Ripogonum scandens), have not been listed since 1870, though there is little doubt that they did occur in Riccarton, particularly during the first years of settlement when the bush was more extensive than it is now. The last plant of supplejack is thought to have died during the 1930s (L.W. McCaskill, pers.comm.). At least one species recorded only by Armstrong - Calystegia tuguriorum - still occurs in quantity. On the other hand, several species he listed are unlikely to have grown in Riccarton, and some of these, e.g. Cordyline pumilio and Dicksonia lanata, were probable errors in identification. Surprisingly, Armstrong did not record some of the more obvious species such as the cabbage tree (Cordyline australis) and the common kowhai (Sophora microphylla).

Cockayne's list in 1906 was clearly incomplete and was drawn up to highlight some of the main floristic features at a time when there was much pressure to acquire Riccarton Bush as a public reserve. Short as it is, Cockayne's list is notable for its accuracy and a number of new records such as the bush rice grass (Microlaena avenacea), the water fern (Histiopteris incisa), and others.

The remaining lists were published at various times following the acquisition of Riccarton Bush as a public reserve in 1914.

The first of these was Wall's list of 1923, a little more than 50 years after Armstrong's. Interestingly, both Wall and Armstrong recorded 94 species of native flowering plants and ferns. However, many of the species listed by Armstrong were not observed by Wall, who gave further accuracy to existing lists and provided several new records, e.g. the small whiteywood (Melicytus micranthus), and the dwarf mistletoe (Korthalsella lindsayi).

A year after Wall's list appeared in print, the Riccarton Bush Board of Trustees published its first handbook in which Murray recorded 97 native flowering plants and ferns, three more than Wall. Two of these, the karamu (Coprosma lucida) and the ngaio (Myoporum laetum), were listed previously by Cockayne and Armstrong but later rejected by Wall. The third species, Coprosma crassifolia, also in Cockayne's list, was included under C. rubra by Wall, but not by Murray who listed both. Apart from minor differences in the choice of plant names (synonyms), all the other species listed by Murray were recorded also by Wall. Murray's list was repeated in the Trustees' second handbook in 1950, with the exception of ngaio which was omitted. In the third handbook of 1968, Murray's list was revised and the nomenclature brought up to

date, though unfortunately marred by several printing errors. Minor corrections were also made, e.g. Solanum laciniatum for S. aviculare; some species were omitted, e.g. Carex solandri; a few Armstrong records were re-discovered, e.g. Gahnia xanthocarpa; and a new record was added, e.g. Astelia grandis.

Kelly's list, published in 1972, is the most recent record of the native plants of Riccarton Bush. However, it is incomplete (59 species), and is the result of only three hours' fieldwork as part of a major survey of Canterbury reserves. Nonetheless, it contains two new records, the climbing fuchsia (Fuchsia perscandens), and a native rush (Juncus gregiflorus).

In addition to the above lists, the native plants of Riccarton Bush are included with those of nearby places in Wall's booklet "The Botany of Christchurch"; first published in 1922, and revised in 1953. Other information on these plants, some illustrated, occurs in papers and floras written by various authors, and in the standard works of L. Cockayne, one of the prime movers in setting up the reserve.

Riccarton Bush also supports a remarkable collection of adventive plants, and the list published by Healy in 1959, apart from being the first of its kind for any reserve in the country, was also notable for a number of new adventive records for New Zealand, e.g. a spindleberry (Euonymus phellomana), spurge laurel (Daphne laureola) and others. Ten years later, Healy presented almost the same list in "The Natural History of Canterbury". The nomenclature was brought up to date, and there were several deletions and additions.

So far we have been able to add a few new records of native and adventive species found growing in Riccarton Bush. The native species include a marsh pennywort (Hydrocotyle moschata), the star lily (Arthropodium candidum), and the swamp kiokio (Blechnum minus (R.Br.) Ettingsh). New adventive records are Selaginella kraussiana; the female fern (Athyrium filix - femina); and the Hart's tongue fern (Phyllitis scolopendrium), the only adventive record of this fern for New Zealand.

Herbarium specimens, especially the earliest collections, can be very useful in revising the flora of a given area. Some of the first specimens collected from Riccarton and other places around Christchurch, e.g. Dry Bush (see this volume), are now more than 120 years old and particularly valuable. Unfortunately the flora of Riccarton Bush is not as well represented in herbaria as it might be by virtue of its location. Nevertheless, we have been able to confirm some of Armstrong's early written records and add a few new ones. For example, in the Armstrong Herbarium (now housed in the Curator's Office, Christchurch Botanic Gardens) there is one sheet of Nertera (probably N. dichondraefolia) and one of danthonia (Notodanthonia gracilis), both collected at Riccarton by J.B. Armstrong, and both new records. Needless to say, we will check herbarium specimens elsewhere to see if other records for Riccarton Bush exist.

Although several additions to the flora have been established, the losses overall seem to outweigh the gains, especially among the native plants. A feature of Riccarton Bush is the number of native species represented by less than ten or so plants. For example, there are only three mature trees of hinau (Elaeocarpus dentatus), a species probably at its southern limit here, at least for the eastern South Island. Even more disturbing is the number of species reduced to one known plant

e.g. Gahnia xanthocarpa, the climbing fuchsia (Fuchsia perscandens), and the common mistletoe (Ileostylus micranthus). Until recently the white mistletoe (Tupeia antarctica) was also in this category. However, the sole representative - a male plant parasitic on a lemonwood (Pittosporum eugenioides) tree - fell to earth in June 1976, along with its strangled host branch. A specimen of this plant was collected by C.J. Burrows in 1960 (CANU 3500), so that we know it was at least 16 years old (Tupeia was first listed for Riccarton Bush by Cockayne in 1906). But with no female plant handy - the nearest would be on the Port Hills - the elimination of Tupeia from Riccarton Bush was inevitable.

The example of Tupeia - and there are others - highlights an important aspect of reserve management, namely, the need to protect and encourage local floras. Given (1976) reminds us of our obligation to the rare and endangered species of New Zealand. It seems we also have another category to consider - the rare and endangered plants of a region, especially those near the limits of their natural distribution.

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