

Contributions to a Knowledge of the Adventive Flora of New Zealand, No. 6

By A. J. HEALY

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Summary

ONE hundred and nine species, eight varieties, three forms, and six hybrids which occur as garden escapes or persisting garden outcasts are recorded as new for the adventive flora of New Zealand. Five families and forty-four genera are recorded for the first time for New Zealand.

THIS paper is concerned with species which occur either as escapes from cultivation or as persisting garden outcasts. Some of the species have been present in New Zealand in the adventive state for many years, others are of more recent occurrence, and despite the comparative rarity of some species it is considered that their claims to recognition as members of the adventive flora are valid, and their formal recording is necessary. A number of previously recorded species are discussed for clarification of status and distribution. The monocotyledonous element discussed in this paper merits brief mention. The species—bulbous, cormous, and rhizomatous—occur in grassy waste places such as roadsides, vacant and neglected urban sections and the like, and are in the main persisting, slowly-spreading garden outcasts. Observations covering such habitats in both islands show that some species are widespread and permanent members of the vegetation of such waste areas. For instance, examination of grassy verges of twenty streets picked at random in the borough of Upper Hutt showed colonies of varying dimensions of species of *Muscari* and *Narcissus* present in each street, but detectable readily only during the flowering period.

In view of the number of species of cultivated origin treated here, it is perhaps pertinent to again draw attention to the significant contribution of horticulture and cognate rural activities to the adventive flora of New Zealand. Allan (1940: 10) estimated that about 24 per cent. of the adventive flora has its origin from horticulture, but I would now suggest that the proportion has increased since that time. Economically significant plants in this category include *Eichhornia crassipes* (Mart.) Solms., *Erica* spp., *Homeria breyniana* (L.) Lewis, *Oxalis* spp., *Pennisetum macrourum* Trin., *Rosa rubiginosa* L., *Sarothamnus scoparius* (L.) Wimmer, and *Ulex europaeus* L., while there is the large group of colourful, but less significant species exemplified by *Eschscholtzia californica* Cham. It will be appreciated then that formal recognition of status and recording of species in the two categories—garden escapes and persisting garden outcasts—is essential, both botanically and economically.

The bracketed numbers in the text refer to voucher specimens in the herbarium of Botany Division, D.S.I.R., Christchurch, these having been collected by myself unless another collector's name is cited.

I am indebted to officers of Botany Division, D.S.I.R., and to private collectors, especially to K. W. Allison, Esq., Dunedin, for making available specimens and observations for incorporation in this paper, and to T. W. Rawson, Botany Division, D.S.I.R., for checking the fern species.

**Abies* sp. (Pinaceae). Seedlings and more advanced juvenile stages of a species of *Abies* were found in dark, steep gullies, damaged coastal forest, near Akaroa, 1955

* Indicates throughout this paper species or varieties recorded for the first time as adventive in New Zealand.

(89506). C. M. Smith, Director, Botany Division, advises that he has observed similar occurrences of *Abies* at Hanmer and near Wanaka, Otago.

**Acanthus mollis* L. (Acanthaceae). Noted as a garden escape in several North Island localities, this species has spread to roadside banks and waste land, proving troublesome to eradicate: roadside banks, near Trentham, Hutt Valley, 1953 (84294).

Acer pseudo-platanus L. (Aceraceae). This species was recorded by J. B. Armstrong (1880: 353) from Canterbury; it was omitted from both editions of Cheeseman's *Manual of the New Zealand Flora*, noted by Thomson (1922: 562) on the authority of Cheeseman as "spreading in many localities in the neighbourhood of plantations", and cited by name only by Allan (1940: 293).

Little has been written on the status of the species as the above review indicates, consequently two published notes, probably unknown to most local botanists, are worth citing.

Tannock (1941: 97-8), dealing with the history and operation of Municipal Reserves Departments in New Zealand stated, in connection with water catchment areas that "Where this area is covered with native bush, which is ideal, there is nothing much to do, except to cut out elderberry and sycamore, which attack it from within, to clear *muehlenbeckia*, which attacks it from above, and gorse and broom which attack it from without. All these, which are fifth columnists of the bush world, if left alone, would soon destroy it."

Davies (1948: 172) in his Presidential Address to the British Grasslands Society, stated that "Sycamore has also been introduced into New Zealand where, also, it has invaded the forest and now takes a normal place in forest succession as a secondary, rather than a primary type."

My observations show that the species occurs (except in rare instances), and is significant only in the vicinity of settlement, and that it does not invade undamaged forest, or damaged forest remote from settlement—i.e., away from homesteads, plantations, and other seed sources. The occurrence of a single tree on an old slip site in indigenous forest on the slopes of Mt Stokes (ca. 2,000ft), Sounds County, at a considerable distance from settlement is one of the rare occurrences remote from settlement.

A. pseudo-platanus has been widely planted in New Zealand, and is now widely spread as an adventive in both islands. Seedlings appear in gardens and cultivated land in the vicinity of seed sources, scattered trees and colonies occur in waste land, on roadsides and about rivers and creeks and, as mentioned by Thomson, in and about plantations. It occurs marginally about damaged forest and through much damaged forest. The species is commonly seen as a prominent element in small remnants of damaged forest held as reserves or parks in the vicinity of towns and cities.

**Achillea ptarmica* L. (Compositae). Noted as established on grassy roadside, Mill Road, near Invercargill, 1956 (89634). This material agrees with *f. multiplex* (Reynier) Heimerl, a form cultivated for its double flowers. A yellow-flowered species of *Achillea*, as yet unidentified, has been found as a garden escape on a roadside near Christchurch, 1955 (89581).

Agapanthus orientalis Leighton (Amaryllidaceae). Found as a persisting garden escape and garden outcast; roadside, *R. Mason and N. T. Moar*, 1953 (88610); near Orouaiti, Westport, *R. Mason and N. T. Moar*, 1953 (81051); Oamaru, 1957 (98648). The species was recorded from roadsides at Hokianga by Neuman (1952: 695), and observed at Charleston by Mason and Moar in 1953. It has been noted by the writer on banks and roadsides and sites of old homesteads in North Auckland localities, and on coastal cliffs at Lyttelton, Port Chalmers, and Anderson's Bay, Dunedin.

**Ajuga reptans* L. (Labiatae). Escaped from cultivation and well established along damp banks, Trentham, Hutt Valley, 1953 (84251). The name was used by

Thomson (1875: 374) to record *Prunella vulgaris* L. from Dunedin, the error being corrected by Kirk (1878c: 416).

**Allium roseum* L. ssp. *bulbiferum* (DC.) E. F. Warburg (Amaryllidaceae). This Mediterranean plant, the particular sub-species characterized by the bulbils borne in the umbels with the flowers occurs as a spreading garden escape (outcast?) in grass, Christchurch, 1955 (89549).

**Alstroemeria aurantiaca* D. Don (Amaryllidaceae). Observed in the non-flowering state on roadsides at Feilding and Whangarei, the species has been collected from roadsides and railway embankments. Upper Hutt, 1945, 1950 (33902, 70280); in grass, roadside, Christchurch, 1955 (89572); in gorse and lupin, Upper Selwyn River, near Coalgate. R J Sheehy, 1955 (89601); Shag River, near Palmerston, V. D. Zotov, 1950 (75261).

**Althaea rosea* (L.) Cav. (Malvaceae). Occasional and non-persistent escape about rubbish-dumps and waste sections in localities in both Islands: Alexandra, 1957 (98610).

**Amaranthus caudatus* L. (Amaranthaceae). Occasional about rubbish dumps and sites where garden refuse is deposited, especially about municipal reserves in both islands: Christchurch, 1955 (89501); Roxburgh, 1957 (98625).

Anemone x hybrida Paxton (Ranunculaceae). Allan (1940: 280) first recorded *A. japonica* Sieb. et Zucc. ("This and other garden anemones escape and tend to persist") as adventive in New Zealand. The name *A. japonica* is, as shown by Bowles and Stearn (1947: 261-8, 297-308), untenable for what is in effect a complex, being a later homonym antedated by *A. japonica* of Houttuyn which was applied to a species of *Clematis*. It is shown also that the "Japanese anemones" of horticulture were derived from the crossing of *A. hupehensis* Lemoine var. *japonica* (Thunb.) Bowles et Stearn and *A. vitifolia* Buchanan-Hamilton, the resultant hybrid being *A. x hybrida* Paxton as indicated by Lawrence (1949: 35); not *A. x elegans* Descaigne as suggested by Bowles and Stearn.

The plants escaped and established locally in both islands show two flower types—the one with pink tepals, the other with white tepals (clon. Honorine Jobert). The distribution of this hybrid in New Zealand is much wider than indicated by the few herbarium specimens available: forming masses on banks and cliff faces. Tauranga, M. Hodgkins, 1938 (19376, 19377); old cemetery, Wellington, D. Cairns, 1944 (48146); in forest remnant, Upper Hutt, 1954 (88955) (tepals white).

**Anemone nemorosa* L. (Ranunculaceae). Noted on shady grassy banks, Dunedin, K. W. Allison, 1954 (89520).

Araujia sericofera Brot. (Asclepiadaceae). The occurrence of this species in the warmer parts of the North Island was noted incidentally by the writer (Healy, 1953: 11) in a publication of limited distribution, and is cited here for reader availability. The species has been found in localities through North Auckland, about Auckland City, Tauranga, Whakatane, Opotiki, Gisborne, Rotorua, Urenui, Waitara, New Plymouth, Napier, and Hastings.

The plant is perhaps better known under its several horticultural names—*Physianthus albens* and *Araujia albens*, and the common names—moth-catching plant and kapok-vine. It was treated by T. W. Kirk (1894: 75-6) in the category "Useful Plants" as a potential trap for codlin-moth, but Kirk stated that he saw no evidence of it catching codlin-moths, neither did he mention that it had escaped from cultivation at that time.

The increasing abundance and distribution of this plant has significance in that it has been suspected of being toxic to poultry in New South Wales (Hurst, 1942: 325).

**Arbutus unedo* L. (Ericaceae). Occurs sparingly in *Leptospermum* scrub and about forest margins, hills south-east of Upper Hutt, 1953 (83202).

Arum italicum Mill. (Araceae). This is almost certainly the "*Arum* sp., either *A. maculatum* or a closely allied species" cited by Mason, Moore and Cooper (1950:

86) from Okupu Bay, Great Barrier Island, and the plant referred to by Matthews (1953: 524) as *A. maculatum* (cuckoo pint), with the note "It grows wild in fields and even on railway embankments".

The plant shows considerable variability in size and intensity of vein colour over its range in New Zealand; it is more common in the North Island, occurring as a weed of roadsides, waste land about settlements, under hedges and about plantations, in orchards, and gardens about old homesteads, proving troublesome to eradicate. Kopu, near Thames, *N. M. Adams*, 1945 (49514); Paeroa, 1945 (33781) Whakataane, *E. R. Marryatt*, 1950 (77671); Opotiki, *E. R. Marryatt* 1950 (77935); Feilding, 1953 (83196); Upper Hutt, 1952 (79731); Lower Hutt, 1953 (84286); Okaramio, Marlborough, 1955 (89547); Riccarton, Christchurch, 1954 (91446).

**Asparagus asparagoides* (L.) Wight (Liliaceae). A "smilax" of horticulture. This species occurs as a garden escape in the Auckland Province: roadsides, Dargaville, 1950 (81437); thoroughly established through *Berberis* and *Crataegus* hedges in farmland between Manurewa and Papatoetoe, 1950 (70276). Noted also in hedges and waste places, Kawakawa, North Auckland.

Aster spp. (Compositae). A number of entities of the horticultural "Michaelmas daisy" have escaped and occur on roadsides and other waste land in both islands. The plants noted and collected belong to several species, but accurate identification has not been possible to date: the complex is mentioned here in order that more collections might be made from different localities to supplement those already held, so that ultimately the material can be submitted to a specialist in the group for determination.

**Atriplex hortensis* L. (Chenopodiaceae). A pot herb found as a garden escape in South Island localities: waste sections and roadside, Addington, Christchurch, 1956 (92110); waste sections, Christchurch City, 1955 (89576); coastal, Timaru, *R. Mason*, 1945 (89656); waste land, Alexandra, 1957 (98619). The reddish-coloured form (f. *rubrum* (Crantz) Roth.) is well established on roadsides and in waste land, Ophir, Central Otago, 1956 (89622), and about river banks, Alexandra.

**Berberis x stenophylla* Lindl. (Berberidaceae). This hybrid (*B. darwinii* Hook. x *B. empetrifolia* Lam.) occurs in mixed *Leptospermum-Ulex* scrub on hillsides, Heretaunga, Hutt Valley, 1953 (84316); in mixed *Cytisus-Ulex* scrub, on cliffs and hillsides, Macandrew Bay, Dunedin Harbour, 1954 (83251). Associated with this plant in the Heretaunga occurrence were a few shrubs of **B. julianae* Schneid. or an allied species.

**Buddleia globosa* Lam. (Loganiaceae). Occurs with *Berberis darwinii* and *Leycesteria formosa* about margins of damaged forest, near Petone, Hutt Valley, 1945 (33944). This species has been observed as persisting about sites of old homesteads in both islands.

**Buddleia salvifolia* Lam. (Loganiaceae). Occurs as scattered plants and small colonies in mixed *Cytisus-Lupinus* communities on river-flats, Hutt River, near Wallaceville, 1953 (84307). Non-flowering plants adventive about the margin of the Town Belt, Dunedin, almost certainly belong to this species.

**Calceolaria* aff. *gracilis* H. B. K. (Scrophulariaceae). A garden escape on shady banks, Karori, Wellington, 1945 (58018); under mixed *Cytisus-Rubus-Ulex* community on shady, wet hill slope with *Cardamine flexuosa* With near Melling, Hutt Valley, 1953 (82651).

**Campanula rotundifolia* L. (Campanulaceae). Established on dry grassy banks, Wellington City and suburbs, 1954 (85715); in cracks of road gutters and footpaths, Christchurch, 1954 (91555).

**Cerastium tomentosum* L. (Caryophyllaceae). Found as a garden escape, Eketahuna, *V. D. Zotov*, 1944 (35562); in grass on roadsides and railway embankments, Upper Hutt, 1953 (85756); in grass, waste land, escaped from abandoned rockery, Wellington, 1944 (35563, 35587); stony banks, Fairlie, 1957 (98634); spread from cemetery into modified tussock grassland, Ranfurly, 1957 (98633);

cliffs along Clutha River, Roxburgh, 1957 (98632). Specimens collected by R. Mason, 1951 (71762) from Dunedin, and by the writer from the same locality in 1954 show differences from those cited above, and may be more correctly placed under *C. biebersteinii* DC.

Cestrum spp. (Solanaceae). While as yet neither widespread nor abundant in the adventive state in New Zealand, species of *Cestrum* have definite economic significance as causing poisoning of farm livestock, both cultivated and adventive specimens being source shrubs of toxic material.

To date no species of *Cestrum* have been listed in the main compilations of adventive species, although I have found a reference by Aston in an Annual Report of the Department of Agriculture (1908: 228) in which it is stated "Within Mr. Cheeseman's own knowledge cattle have probably died from eating the young succulent branches of another species (probably *C. parqui*, the seed of which came from Chili) which has become almost naturalised on Mr. McLaughlin's property near Papatotoi".

The present position with *Cestrum* appears thus:

C. aurantiacum Lindl occurs as "A garden escape forming thickets" Mangonui, G. T. S. Bayliss, 1948 (59847). This gathering and sheet is the basis for the statement by Connor (1951: 89) in his work on poisonous plants that "—, one species occurs as a garden escape at Mangonui, North Auckland".

C. fasciculatum Miers was found as a garden escape, Kimbolton, near Feilding, R. S. Mason, 1944 (48408), and as forming a large colony on a farm, Arahura, Westland, R. Larsen, 1956 (92111). In both occurrences the plant was responsible for poisoning of cattle. A related species, with glabrous calyx and corolla, was found as a garden escape, Waitata Bay, Sounds County, 1944 (47109).

C. parqui L'Herit. Recently I examined specimens of this species stated to be adventive on a farm, Pukinui Creek, Panatoetoe, J. McCaw, 1956 (93551), and in view of Aston's record (cited above) of nearly half a century earlier for the same district, I instituted enquiries as to whether this recent gathering was from the original infestation. I am indebted to Mrs P. Hynes, Auckland Institute and Museum, Auckland, for checking this matter, and she advises that J. McCaw's specimens are from a property adjoining that cited by Aston in 1908, and that the plant had spread from the property originally infested, probably being dispersed by birds.

**Clematis orientalis* L. (Ranunculaceae). This climber has been found as an escape in waste land, Rakaia, 1955 (89526), 1956 (93283); a single plant, waterfront, Timaru, R. Mason, 1945 (98593); occasional, scrambling over scrub on riverbanks and on rocky faces, Alexandra, 1957 (98594); scrambling over *Rosa rubiginosa* L. on hillsides, between Fruitlands and Alexandra, 1957 (98595).

**Coreopsis tinctoria* Nutt (Compositae). Has persisted for some years and occurs sparingly on stony roadside and riverbed, Hutt River, near Upper Hutt, 1952 (79201).

**Cosmos bipinnata* Cav (Compositae). Occurs with *Coreopsis tinctoria* on dry stony riverbed, Hutt River, near Upper Hutt, 1952 (78753); immature plants from waste land, Christchurch, 1955 (89585), 1957 (92206) almost certainly belong to this species. The species is occasional about footpaths, gutters, near rubbish dumps where garden refuse is deposited, and persistent on occasions to the stage of being troublesome in gardens in many localities.

Cotoneaster spp. (Rosaceae). Two species of *Cotoneaster*, both as yet unrecorded, are found as garden escapes in both islands: seedlings of both occur commonly in gardens and waste land in the vicinity of fruiting shrubs, and all stages from seedlings to adults occur in and about forest remnants in the neighbourhood of settlement, the fruits being dispersed by birds.

**C. francheti* Bois. Material which comes closest to this species has been found at Mt Bruce, north of Masterton, M. E. Roberts, 1946 (54298); roadside, Upper Hutt, 1953 (84304); in mixed scrub, Moonshine, Hutt Valley, 1953 (84296); forest

remnant, Riccarton, 1954 (89517); in *Cytisus* thickets. Roxburgh, 1957 (98618). Noted about forest remnants near Port Chalmers, and at Dunedin.

**C. simonsii* Baker has been collected from *Cytisus* thickets and margins of damaged forest, Hutt River, Akatarawa, 1953 (84298); roadsides, Hutt Valley, 1950, 1952 (70941, 89516); coastal forest, Akaroa, 1955 (91478); about plantations, Fairlie, 1957 (98607); damaged forest, Leith Valley, Dunedin, 1954 (88437); roadside, Mornington, Dunedin, 1954 (88432); in gullies on margins of plantations, Tapanui, 1956 (89625). Noted about Christchurch, Hampden, Port Chalmers, and St Leonards, Dunedin.

**Cynara scolymus* L. (Compositae). Occasional plants in waste land, Manuherikia River, near Alexandra, 1957 (98536).

**Dahlia* sp. cult. (Compositae). Forms of the cultivated dahlia showing extensive range of capitulum structure and colour occur as persistent garden outcasts in waste land along the Hutt River between Upper Hutt and Lower Hutt, usually in the vicinity of dumps of garden waste, dispersal being by flood action: Upper Hutt, 1954 (85761); Wallaceville, 1954 (85723). Colonies occur on railway embankments between Melling and Upper Hutt, and in damp shaded gullies about Wellington City and suburbs; in the South Island, colonies have been observed about rubbish dumps and about the base of cliffs at Christchurch, Lyttelton and Dunedin, and in grass on waste land along the Ashley River, near Rangiora, 1957 (98615) and Avon River and tributaries, Christchurch.

**Datura* sp. (Solanaceae). Plants of a tall-growing (2 metres or more) shrubby *Datura* were found in waste places and shrubland (with *Solanum auriculatum*) in several North Auckland localities: Ruawai, Mangawhare, Dargaville, Kaihu, Mangonui, Rawene, between Rawene and Kaikohe, Waimate North, Russell, Whangarei, and Waipu Cove. Flowering material was not available at the time of inspection (May-June, 1950) and subsequent attempts to secure mature material for identification have proved unsuccessful. Fragmentary remains of flowers under plants at Rawene and Waimate North showed several corolla tubes per flower, but since horticultural forms of several species exhibit this character, specific identification on material available is not possible. The plant is brought to notice here in order that botanists in the future will keep a lookout for flowering material in North Auckland localities.

**Dianthus deltooides* L. (Caryophyllaceae). This small Eurasian species appears to have been present in several South Island localities for some years prior to being observed, and is now established: small patch (ca. 1 sq. metre), waste land, The Hermitage, Mt. Cook, R. Mason, 1952 (81110); grassland, west of Naseby, K. W. Allison, 1956 (98587); modified tussock grassland, Ranfurly, 1957 (98585); grassland, Roxburgh, 1957 (98583). The variety with white to pinkish flowers with dark band at the throat, var. *glaucus* (L.) Seringe, has also been collected: in grass on dry river terraces and banks, Homebush, near Darfield, R. J. L. Sheehy, 1955 (89602); modified tussock grassland, growing with the typical form, Ranfurly, 1957 (98586); grassland growing with the typical form, Roxburgh, 1957 (98584); shingly roadside, with *Hypericum perforatum* L. and *Potentilla recta* L. between Wedderburn and Otarehua, Central Otago, 1956 (89623).

Dianthus plumarius L. (Caryophyllaceae). Occurs in modified tussock grassland on light shingly soils, near Ranfurly, Maniototo Plains, 1957 (98582).

**Dierama pendula* (L.) Baker (Iridaceae). Colonies established on the roadsides, Te Puke, Bay of Plenty, 1945 (33968); roadsides, Makino, near Feilding, 1941 (35492). Observed to have escaped and overrun a cemetery, Waiohine River, near Greytown, Wairarapa.

**Doricum pardalianches* L. (Compositae). Established on roadsides and in grass on river stop banks, Hutt River, Lower Hutt, 1954 (82851).

**Dryopteris dilatata* (Hoffmg.) A. Gray (Polypodiaceae). A single plant agreeing well with var. *multifidum* Wollaston was found in the wild state behind Bainham, Nelson district, by Geo. Simpson, and garden grown at Dunedin, 1950 (71628).

**Dryopteris filix-mas* (L.) Schott. (Polypodiaceae). This cultivated fern has escaped and established in localities in both islands: near Kaiwharawhara, Wellington, 1953 (84338); Wellington City, T. W. Rawson, 1950 (71623); Thorndon, Wellington, 1953 (84285); Marshlands, near Christchurch, 1954 (85735); Riccarton, Christchurch, 1954 (85737); Ashburton, 1956 (89680); Town Belt, Dunedin, 1954 (91429, 91430). A crested form close to var. *jervasii* was collected from the Motu Bush district, Gisborne, apparently in the wild state. W. McKeen, 1949 (65932); riverbank, Ashburton, 1956 (89681).

**Euonymus europaeus* L. (Celastraceae). Occurs as an escape in waste land about streams, all stages from seedlings to mature trees present, Avon River, Christchurch, 1954 (91414). This or a closely allied species is not uncommon about plantations, Waimakariri River, near Brooklands, 1956 (92149); plantations, hedgerows, stream banks, Ashburton, 1954 (88424); through forest remnant, Geraldine, 1956 (89649).

**Fraxinus excelsior* L. (Oleaceae). Recorded originally from Ashburton County by Smith (1904: 220), this record appears to have been largely neglected by subsequent workers. The species has escaped and established in several localities: edge of forest remnants, Matakiwi, near Masterton. V. D. Zotov, 1943 (79799); Maitai R., Nelson, V. D. Zotov, 1943 (48319; established on flats along Motueka River, Pangatotara, near Motueka, 1944 (48317); forest remnant, Riccarton, Christchurch, C. M. Smith, 1954 (83195). In the last cited occurrence, seedlings and juvenile stages were abundant, and a similar range of plants occurs about plantations and along streams, Christchurch.

**Gaillardia pulchella* Foug. (Compositae). A garden escape of North American origin collected from Lake Ferry, Palliser Bay, M. J. Simson, 1952 (75395); occasional on roadsides and waste places, Alexandra, 1957 (98591); on roadsides and rocky outcrops, between Fruitlands and Alexandra, 1957 (98590).

**Gaultheria shallon* Pursch (Ericaceae). Naturalized on rough grassy banks and spread slightly since 1946, Dunedin, K. W. Allison, 1954 (89503).

**Gladiolus cuspidatus* Jacq. (Iridaceae). This South African species is now thoroughly established on roadsides, along drains and creeks, and in grassy waste places in the Auckland Province and outlying islands; Whangaparapara Harbour, Great Barrier Island, V. V. Hitchmough, 1949 (69563); Cavalli Islands, off Whangaroa, R. B. Gibson, 1951 (75344); Kaeo, R. Mason and N. T. Moar, 1949 (69636); Mangonui [H. H. Allan ?], 1941 (48529); Warkworth, P. S. Syme, 1941 (35458, 35459) [specimens shorter and flowers smaller than others examined, but almost certainly belong to this species]; Warkworth, L. B. Moore, 1943 (44580); North Kaipara Peninsula, K. R. Allen, 1953 (89532); Swanson, Auckland, V. D. Zotov, 1932 (6479); Henderson, Auckland, L. M. Cranwell, 1937 (19129, 19130); Raglan, 1947 (82117).

**Godetia amoena* (Lehm.) Lilja (Onagraceae) Abundantly established over gravel ballast in railway yards, and waste places about trucking yards, Rolleston, Canterbury, 1955 (89595).

**Gypsophila paniculata* L. (Caryophyllaceae). Persistent for some years in pasture, Belfast, 1956 (91452); at Alexandra, Central Otago, the plant appears to have spread from the cemetery, and scattered plants and colonies occur on roadsides and waste land; in the cemetery it is abundantly established over graves, pathways and grassy places, 1957 (98579).

**Hedera colchica* C. Koch (Araliaceae). Distinguished from the established *H. helix* L. by the scale-like pubescence and the large, entire, cordate leaves, this species occurs on *Populus* and *Salix*, Ashburton, 1956 (98628).

**Helenium autumnale* L. (Compositae). Established in colonies in damp pasture, near Greytown, Wairarapa, 1953 (81365).

**Hemerocallis fulva* L. (Liliaceae). Persistent on grassy roadsides, Marton, W. J. Kissock, 1954 (89522); roadside, Wallaceville, Hutt Valley, 1954 (91526). Probably belonging to this species is the form with many whorls of perianth members, forming colonies on grassy banks, Bolton Cemetery, Wellington, V. D. Zotov, 1945 (58041).

**Hypericum hookerianum* Arn. (Hypericaceae). Occurs in mixed scrub and fern on hills near Ross, Westland, 1947 (70196), and sparingly in fern between Goldsbrough and Kumara, Westland, 1947 (70195).

**Iberis umbellata* L. (Cruciferae). Casual about footpaths and waste places about settlement; Wallaceville, Hutt Valley, 1952 (83237); McCormack's Bay, Christchurch, 1954 (91549); base of cliffs, Anderson's Bay, Dunedin, 1957 (98623); waterfront, Dunedin, K. W. Allison, 1957 (98624); abundant through cemetery, Roxburgh, 1957 (98622).

**Ilex aquifolium* L. (Aquifoliaceae). Occurs as an escape in secondary growth, about margins and interior of forest remnants, in hedgerows and plantations, less commonly in scrub, in vicinity of settlement in districts in both islands: plants at all stages of development from seedlings to mature trees have been observed. In the Kawhia County it was noted remote from present habitations in rough hill country, and in most districts it was associated with plants of other bird-dispersed shrubby species, these often concentrated about large isolated trees of *Crataegus monogyna* Jacq.; in the Hutt Valley, *Ilex* was commonly accompanied by *Ligustrum* spp. Vicinity of Upper Hutt, 1953 (83201), Riccarton, Christchurch, 1954 (83278); Geraldine, 1956 (89648); near Fairlie, 1957 (98558); Port Chalmers, 1954 (91434); Town Belt, Dunedin, 1954 (91439).

**Impatiens* sp. (Balsaminaceae). A species of *Impatiens* of shrubby habit (to 1.5 metres tall) was observed in 1950 as a garden escape about forest margins, on banks and cliffs, and in scrub in several North Auckland localities: Ahipara Bay, Kaitaia, Helena Bay, Kohukohu, between Peria and Victoria Valley, Russell, and near Whangarei. My specimens collected in 1950 were not sufficiently complete for identification, and attempts to secure more material have been unsuccessful. The plant is brought to notice here in order that collections might be made in the future.

**Inula helenium* L. (Compositae). A colony has persisted in grass on a railway reserve, Christchurch, 1954 (83324, 91543).

Ipomaea learii Paxton (Convolvulaceae). First recorded as escaped in New Zealand by Martin (1950: 785) from North Auckland localities, the species has been observed scrambling over trees and hedges in many parts of the North Auckland Peninsula: it has been collected from waste land, Shannon, 1942 (36208); established along railway reserve, near Paekakariki, 1950 (70267).

**Ipomaea mutabilis* Lindh. (Convolvulaceae). Established and spreading over trees in plantation, over scrub on roadside, and marginal about a forest remnant, east of Opotiki, 1947 (70266).

**Ipomaea purpurea* (L.) Lam. (Convolvulaceae). Persistent in hedges and about orchards in Napier district: orchard hedgerows, Pakowhai, P. M. Healy, 1952 (82827).

Iris spp. (Iridaceae). Several species of *Iris* have been recorded as adventive in New Zealand—*I. germanica* L. (Kirk, 1869: 101; 1878b: 405), *I. pseudacorus* L. (Kirk, 1878a: 368), *I. susiana* L. (Kirk, 1878a: 376), but the second species cited appears the only one to have persisted and spread.

**I. foetidissima* L. This species persists and spreads on shaded banks and in forest remnants in both islands, often forming dense and extensive communities. Terrace End, near Palmerston North, 1953 (83203); near Masterton, A. T. Myers, 1956 (92104); Trentham, Hutt Valley, 1953 (84291); Belmont, Hutt Valley, 1953 (82850); Collingwood, L. B. Moore, 1947 (60187); Lyttelton, 1954 (68048);

Riccarton, Christchurch, 1954 (83327); near Temuka, 1956 (98641); Fairlie, 1957 (98638). In one occurrence at Riccarton, a bluish-flowered variant occurs with the more common fulvous type, 1954 (91480).

**I. laevigata* Fisch. Occasional in damp places along Avon River, Christchurch, 1954 (83325).

**I. orientalis* Mill. Occasional, forming dense colonies on roadsides between Halcombe and Stanway, near Feilding, 1951 (68047).

I. spuria L. has been reported by the Editor [J. W. Matthews], N.Z. Gardener (1946: 217) as ". . . a common species that has naturalised itself in many parts of New Zealand", and subsequently by B. Matthews (1947: 234-9) as occurring wild on roadsides. The species has not yet been identified by the writer, but its reported occurrence is notified that search can be made.

**Jasminum humile* L. (Oleaceae). Established and spreading on outskirts of forest remnants, between Shannon and Mangahao, 1942 (35467); limestone outcrops, Hamama, Takaka, *H. E. Connor*, 1952 (82052); margin of Town Belt, Dunedin, 1954 (91436) [close to var. *glabrum* (DC) Kobuski]. Immature plants found in the Whakarewarewa State Forest, Rotorua, by *G. S. Rawlings* in 1955, and in waste land, Blenheim, by the writer in 1955 may belong to this species.

**Jasminium officinale* L. (Oleaceae). Persisting and spreading slowly in waste land about Christchurch, 1943 (41341).

**Kochia scoparia* (L.) Roth (Chenopodiaceae). An occasional escape in both islands, usually about roadside and rubbish dumps: Lincoln, 1956 (92094).

Laburnum anagyroides Medic. (Papilionaceae). I agree with Allan (1940: 291) that the entry "*Viburnum vulgare*, L., Europe" under Leguminosae by Smith (1904: 218) could be accepted as the first record of the species as an adventive. Allan (*loc. cit.*) reports the plant as an occasional escape, but cites no localities. It occurs about plantations, roadsides, occasionally about and in forest remnants in Canterbury and Otago, more common in South Canterbury: coastal forest, Akaroa, 1955 (91476); between Orari and Winchester, 1956 (89678); Fairlie, 1957 (98598); Ranfurly, Maniototo Plain, 1957 (98486).

**Lactuca sativa* L. (Compositae). Occasional escape about footpaths and roadsides in towns and near rubbish dumps in both islands: Christchurch, 1956 (92083); waterfront, Timaru, *R. Mason*, 1945 (58788).

**Lathyrus grandiflorus* Sibth. et Smith (Papilionaceae). Established on steep grassy banks, Dunedin, *K. W. Allison*, 1954 (89498).

**Lathyrus sylvestris* L. (Papilionaceae). Established in waste land along road and railway reserves, and "Forms isolated patches up to $\frac{1}{2}$ chain across", between Palmerston and Dunback, *K. W. Allison*, 1955 (89499); similar habitat, coastal, near Maheno, North Otago, 1956 (89641).

Lathyrus tangitanus L. (Papilionaceae). Previously recorded as an escape only from near Blenheim by Allan (1940: 291), this species has been found in localities in both islands: Kinohaku, Kawhia Harbour, 1948 (84398); Palmerston North, *V. D. Zotov*, 1928 (562); Haywards, Hutt Valley, 1950 (85991); Eastbourne, Wellington Harbour, 1953 (84145); Blenheim, *H. H. Allan*, 1929 (925); Omapa, near Blenheim, 1955 (89556); Head of Harbour, Lyttelton, 1955 (91489).

Another *Lathyrus*, either a variety of *L. tangitanus* or a closely allied species occurs in scattered localities: it differs from *L. tangitanus* in the constantly 3-flowered inflorescences, the considerably broader leaf pinnae, and shorter calyx teeth: it has been collected from St. Heliers, Auckland, *M. Hodgkins*, date not given (4469); Wanganui, *H. H. Allan*, 1928 (808); Kelburn, Wellington, *H. H. Allan*, 1937 (19076); Wellington, *R. Mason*, 1950, 1951 (70342, 70716); Seatoun, Wellington, 1941 (48247); Redcliffs, Christchurch, 1954 (88921).

**Leucojum aestivum* L. (Amaryllidaceae). Occurs in grass on roadsides and in waste places, Maewa, near Feilding, 1953 (83215); Terrace End, near Palmerston

North, 1953 (83223); Upper Hutt, 1953 (83222); Wallaceville, Hutt Valley, 1953 (83221); Riccarton, Christchurch, 1954 (8330, 88966).

**Ligustrum lucidum* Ait. (Oleaceae). An occasional hedge escape in North Auckland: M. Hodgkins states the species to be "spreading in some plantations". Auckland Domain, Auckland, date not stated (3906).

**Ligustrum ovalifolium* Hassk. (Oleaceae). A hedge escape on roadside east of Upper Hutt, 1952 (81363); roadside banks, Wellington, 1953 (84302).

**Lilium tigrinum* Ker-Gawl. (Liliaceae). An outcast about cemetery, Fairlie, 1957 (98617); occasional on roadside (remote from habitation), near Milton, 1957 (98616); a garden escape spreading about pathways and grassy places, and an outcast established and spreading in gully behind cemetery, Tapanui, 1956 (89667). Immature plants in dry stony waste land near the Omaka Cemetery, Blenheim, appear to belong to this species. A double flowered form of this species was collected from neglected land, Orowaiti Cemetery, Westport, R. Mason and N. T. Moar, 1953 (81052).

**Linaria maroccana* Hook. f. (Scrophulariaceae). Distinguished from the previously recorded *L. bipartita* Willd. (Allan, 1940: 300) by being glandular-pubescent above, and spur considerably longer than the rest of the flower, this species has been noted as a garden escape in waste places: McCormack's Bay, Christchurch, 1954 (91547); Upper Selwyn River, near Coalgate, 1955 (89609); Invercargill, 1956 (89627).

**Linaria repens* (L.) Mill. (Scrophulariaceae). Distinguished from *L. vulgaris* Mill. by the pale lilac corolla with violet veins, this species is persistent and troublesome in garden beds, Botanic Gardens, Christchurch, B. L. Nicholls, 1955 (91463).

**Lithospermum purpureocaeruleum* L. (Boraginaceae). A colourful rhizomatous ornamental well established on a roadside near Ashburton, 1956 (98644).

**Lonicera periclymenum* L. (Caprifoliaceae). Persistent and spreading on sites of old homesteads, old mine workings, and roadsides, in the Hokitika, Goldsborough and Kumara localities: between Goldsborough and Kumara, 1947 (70277).

Lunaria annua L. var. **albiflora* DC. (Cruciferae). Colonies of this white-flowered variety occur with **Alliaria petiolata* (Bieb.) Cavara et Grande under *Populus* and *Salix* along banks of Ashburton River, Ashburton, 1956 (89685).

**Lupinus angustifolius* L. (Papilionaceae). Occasional to not uncommon about farmyards, railway loading banks and sheds, seed stores and cleaning plants, and railway-line ballast, more common in South Island: railway yards, Palmerston North, 1945 (33770); for several miles along dry roadside, Fairhall, near Blenheim, 1955 (89552); railway embankment, Ashley River, near Rangiora, 1956 (92148); railway-line ballast, Addington, 1957 (98639); railway reserve, Rakaia, 1956 (95044); Ashburton, 1956 (95045); railway ballast, Temuka, 1956 (92211).

**Lupinus polyphyllus* Lindl. (Papilionaceae). A persistent and spreading garden escape on roadsides in both islands: Trentham, Hutt Valley 1953 (82848); Arthur's Pass township, R. Mason, 1945 (58676); Bealey Corner, Bealey River, R. Mason, (58677); Clinton-Mataura district, R. Mason and N. T. Moar, 1952 (76728). The species has been observed on roadsides at Marton, Feilding, Palmerston North, Featherston, Upper Hutt, and many localities in Canterbury, Otago and Southland.

**Lychnis chalcedonica* L. (Caryophyllaceae). Noted in grassy waste land, Christchurch, 1955 (89584).

**Lychnis coeli-rosa* Desr (Caryophyllaceae). Occurs on river-bed, Hutt River, Upper Hutt, 1950 (82825); established in grass and on bare ridges of hills, Kaiwharawhara, near Wellington, 1953 (84339); river-bed, Ashley River, near Rangiora, 1957 (98637); waste land, New Brighton, Christchurch, 1956 (92140).

**Lythrum salicaria* L. (Lythraceae). Occasional in grassy waste land along Avon River and tributaries, Christchurch, 1954 (85721).

**Mahonia aquifolium* (Pursh) Nutt. (Berberidaceae). Noted as persistent on sites of old homesteads, occasional as an escape about forest remnants and on roadsides: Heretaunga, Hutt Valley, 1953 (84317); Haywards, R. J. Dunn, 1945 (51488).

Malus sylvestris (L.) Mill. var. *mitis* Wallr. (Rosaceae). Recorded originally by J. F. Armstrong (1872: 288) from Canterbury, the species was stated by Thomson (1922: 409) to be “. . . nowhere naturalised”, and was cited by name only by Allan (1940: 287).

The species is widely distributed as an adventive, usually as isolated trees, less commonly in colonies or groves. It occurs in waste land along road and railway reserves and in scenic reserves about camping sites and along trackways. It is a characteristic plant along road and railway reserves, serving to illustrate dispersal of fruits by human agency. Observations along the main trunk railway lines in both islands show a band of malus trees extending from the northern to the southern limit of the railway system, including the localities remote from settlement.

**Medicago arborea* L. (Papilionaceae). Escaped and sparingly established on coastal cliffs and waste land: Plimmerton-Pahautanui-Paramata district, 1953 (83240); Eastbourne, Wellington Harbour, Miller, 1948 (62576); McCormack's Bay, Christchurch, 1954 (83341).

**Mentha x citrata* Ehrh. (*M. aquatica x spicata*) (Labiatae). This hybrid has been included under *M. aquatica* L. in the past in New Zealand, and the distribution of that species appears in fact to be based on that of this hybrid plant. I have seen only one undoubted specimen of *M. aquatica* from New Zealand—Bay of Islands, T. Kirk, March, 1868 (specimen in herbarium, Dominion Museum, Wellington).

M. x citrata and *M. aquatica* are similar in general aspect, but the hybrid is distinguished by the glabrous calyces and pedicels, and included stamens.

This hybrid is established, sometimes forming extensive colonies on damp roadsides, about creeks and swamps and damp waste places: Silverdale, North Auckland, F. W. Bartlett, date not stated (89492); Auckland, R. D. Scott (51321); Tokaanu, 1947 (61847); Raetihi, J. E. Attwood, 1940 (48506); Feilding, 1940 (33427); Tauwharenikau River, between Greytown and Featherston, 1953 (81370); Kaitoke, 1946 (58034); Silverstream, Hutt Valley, 1942 (36212); Stokes Valley, Hutt Valley, T. W. Rawson, 1953 (84192); Khandallah, Wellington, R. Mason, 1940 (23768); Fendalton, Christchurch, 1954 (85736).

**Mentha cordifolia* Opiz (*M. rotundifolia x spicata*) (Labiatae). A persistent and spreading garden outcast, this hybrid has been noted on roadsides and waste places about settlements in both islands: Tauranga, M. Hodgkins, 1955 (89493); Paekakariki, 1950 (91442); Trentham, Hutt Valley, 1953 (81367); Taita, Hutt Valley, 1953 (81366); Waiwhetu, Hutt Valley, R. Mason, 1952 (74859); Nelson, R. Mason, 1946 (34969); New Brighton, 1954 (88454); Fendalton, Christchurch, 1955 (89509).

Resembling *M. rotundifolia* (L.) Huds. in habit, this hybrid is distinguished by the green rather than grey colour, the leaves glabrous except for scattered hairs on the veins of the underside, and pedicels and calyces glabrous.

**Mentha x nilaca* Jacq. (*M. longifolia x rotundifolia*) (Labiatae). A mint agreeing most nearly with this hybrid has been found in pastures and about water courses, Te Aroha, Department of Agriculture, 1957 (98629); established in pastures, locally abundant, Opoutama, Wairoa County, Department of Agriculture, 1954 (68055); Makirikiri Valley, Wanganui district, A. A. Duncan, 1956 (89669).

**Miscanthus sinensis* Anderss. (Gramineae). Escaped and established along track to dam, Huia, near Auckland, P. Hynes, 1955 (89529) (var. *zebrinus* Beal.); roadside, Kaitaia, H. G. Halliwell, 1956 (89671). Observed in waste land near Whangarei and Rotorua, in the latter occurrence having spread to a small extent over a ten-year period.

**Muscari neglectum* Guss. (Liliaceae). A garden outcast, forming colonies in grass on roadsides: Terrace End, near Palmerston North, 1953 (83210); Upper Hutt,

1953 (83208); Wallaceville, Hutt Valley, 1953 (83209); Trentham, Hutt Valley, 1953 (83206); Avon River, Riccarton, Christchurch, 1954 (83339); Mornington, Dunedin, 1954 (88968); Maori Hill, Dunedin, 1954 (89512); Anderson's Bay, Dunedin, 1954 (88965).

Narcissus spp. (Amaryllidaceae). A number of species of *Narcissus*, including one previously recorded from an outlying island, occur as persistent and slowly spreading garden outcasts on roadsides and grassy waste places in both islands. The specimens examined do not in some instances agree exactly with descriptions of species and varieties available, but are cited below under the species or hybrid which they most nearly match.

N. x biflorus Curt. (*N. poeticus x tazetta*). Recorded originally from Kapiti Island by Cockayne (1907: 22). Upper Hutt, 1953 (84238); Wallaceville, Hutt Valley, 1953 (84843); Awarua Street Station, near Ngaio, Wellington, *R. Mason*, 1953 (81792, 81793); Riccarton, 1954 (83344).

**N. x incomparabilis* Mill. (Section *Ajax* x *N. poeticus* agg.) Wallaceville, Hutt Valley, 1953 (83218, 83225); Riccarton, Christchurch, 1954 (83329, 83343).

**N. majalis* Curt. Wallaceville, Hutt Valley, 1953 (84321).

**N. odoratus* L. Wallaceville, Hutt Valley, 1953 (84324).

**N. poeticus* agg. Wallaceville, Hutt Valley, 1953 (84320); Trentham, Hutt Valley, 1953 (84249); Riccarton, Christchurch, 1954 (83345).

**N. pseudo-narcissus* L. Maewa, near Feilding, 1953 (83211, 83213); Makino, near Feilding, 1953 (83212); Wallaceville, Hutt Valley, 1953 (83216); Trentham, Hutt Valley, 1953 (83205); Avon River, Fendalton, Christchurch, 1954 (89535).

**N. tazetta* agg. Makino, near Feilding, 1953 (83214); Upper Hutt, 1953 (83217); Avon River, Christchurch, 1954 (83338); Mornington, Dunedin, 1954 (89507).

**Nemesia* sp. (Scrophulariaceae). Collected from edge of bush on steep slope, Ross Creek, Dunedin, *K. W. Allison*, 1948 (85722); edge of damaged forest, Maori Hill, Dunedin, 1954 (91438).

**Nepeta x faassenii* Bergmans ex Stearn (Labiatae). This hybrid, the putative parents of which are *N. mussinii* Spreng. and *N. nepetella* L. occurs established on dry banks in pasture, probably escaped from a nearby deserted homestead site near Cheviot, 1944 (58032).

**Nepeta mussinii* Spreng. (Labiatae). Colonies established on roadside, probably originating as a garden outcast, Cashmere, Christchurch, 1954 (83318).

Nerium oleander L. This shrubby species was reported by Martin (1950: 785) from the North Auckland Peninsula, "Further north along the eastern coasts one may see colonies of *Oleander* in all stages from tiny plants to flowering stage". I have observed the species established in scrub between Taipo and Mangonui, and E. G. Stainton, late of the Department of Agriculture, Kaitaia, has advised that it occurs in scrub north of Kaitaia.

The escape and establishment of this species has potential economic significance, since Steyn (1934: 333-7) and Hurst (1942: 320-3) report it as toxic to livestock, especially sheep, in South Africa and New South Wales respectively, the toxicity owing to the two glucosides—nerioside and oleandroside.

**Nicotiana glauca* Graham (Solanaceae). Established on coastal cliffs and other waste land near Port Ahuriri, Napier, 1950 (84447); roadside banks near coast, Napier, *R. Mason*, 1951 (71403). Noted as occurring sparingly on waste land about Westshore, near Napier.

This shrubby to tree-like species has been used horticulturally in many countries, and has escaped and established in a number, being reported as adventive in California by Robbins, Bellue and Ball (1941: 338-9), in Cape Province and Orange Free State by Steyn (1934: 365) and in New South Wales by Hurst (1942: 364).

The plant has potential economic significance should it become more widely distributed, as it is reported by Muenscher (1939: 207) as toxic to livestock in California, Australia and South Africa, the active principle, according to Rindl and

Sapiro (1949: 301–12) consisting largely of an optically inactive anabasine, an isomer of nicotine.

Nothoscordum inodorum (Ait.) Nicholson (syn. *N. fragrans* (Vent.) Kunth) (Amaryllidaceae). Recorded originally from New Zealand by T. W. Kirk (1899: 225) when he stated, "This weed, which much resembles a poorly-grown onion, is spreading in the warmer portions of the colony, and is not unlikely to become a very serious pest", it is probable as suggested by Allan (1934: 46) that the plant actually concerned was *Allium triquetrum* L. The record was virtually rejected by Allan (1940: 305) who stated ". . . but the New Zealand determination appears to be an error".

The plant was then formally recorded by Allan (1945: 26)—". . . was found to occur in several localities.", this being based in part on specimens found at Whakataane in 1944 by Pritchard, Department of Agriculture, Wellington. It has since been found as a persistent and troublesome escape in gardens and about footpaths: Eastbourne, B. Rough, 1956 (92176); Wellington, 1953 (82846); Christchurch, 1956 (92129); Timaru, Department of Agriculture, 1956 (92135).

**Oenothera rosea* Ait. (Onagraceae). Characterized by the rosy flowers and clavate winged capsules, this American species was found at Parnell, Auckland, B. E. G. Molesworth, 1945 (Auckland Museum, 29699, 29670; Botany Division, 54375), where at that time it appeared to be spreading. At my request, Mrs. P. Hynes kindly examined the locality and advised (May, 1953) that there was then no evidence of the plant on footpaths, road channels, or adjacent waste land.

**Ornithogalum umbellatum* L. (Liliaceae). An escape from cultivation in cemeteries, spreading in grass and shingle trackways, in one occurrence in adjacent pastures: Rangiora, 1956 (98429); Kaiapoi, 1956 (98430); Ashburton, 1956 (92219).

**Oxalis latifolia* H. B. K. (Oxalidaceae). A Mexican species occurring as a persistent, spreading and very troublesome weed of home gardens, nurseries and market gardens, and waste places in North Island and northern half of South Island. This is almost certainly, in fact, the plant recorded as *O. bowiei* Herb., without distribution, by Allan (1940: 285), and which, with *A. pes-caprae* L. represents the troublesome bulbous "*oxalis*" of horticultural articles in New Zealand. It is recognized by the bulbous habit, the many bulbils on short runners, the very broadly obdeltoid leaflets, the simple inflorescence, and the violet corolla with greenish tube.

SPECIMENS EXAMINED. Remuera, Auckland, M. Hodgkins, date not given (3888); Taradale, Hawke's Bay, 1950 (79278); Upper Hutt, 1952 (78754); Taita, Hutt Valley, D. Cairns, 1944 (48220); Waterloo, Hutt Valley, 1945 (33672); Kelburn, Wellington, T. W. Rawson, 1952 (92109); Nelson, V. D. Zotov, 1943 (41488); Nelson, R. Mason, 1946 (34970); Christchurch, I. A. McNeur, 1945 (33680); Fendalton, Christchurch, 1954 (85751). A collection from Moutoa Swamp, near Shannon, 1942, probably belongs to this species.

Another plant differing from *O. latifolia* in the leaflets often less broadly obdeltoid, the sepals and petals narrower, and corolla whitish to pale lilac has been noted, in one instance growing with *O. latifolia*: Tauranga, M. Hodgkins, date not given (45286); Normanby, Taranaki, H. B. Cooper, 1942 (25451); Upper Hutt, 1952 (91443).

**Oxalis martiana* Zucc. (Oxalidaceae). A bulbous species of Brazilian origin with limited distribution as a garden weed: Hastings, V. D. Zotov, 1943 (48219); Trentham, Hutt Valley, 1952, 1953 (85935; 82669). A further collection from Napier, A. J. D. Barker, 1944 (48218) belongs to this species, but it is not clear whether it was of adventive or cultivated origin.

**Oxalis tuberosa* Molina (Oxalidaceae). This species is cultivated from time to time for the edible tubers and is occasionally seen as a garden outcast in waste sections and near dumps where garden refuse is deposited: Khandallah, near Wellington, R. Mason, 1954 (87226); Karori, Wellington, R. Mason, 1952 (74864); Balclutha, R. Mason and N. T. Moar, 1952 (75977).

**Passiflora caerulea* L. (Passifloraceae). Established and spreading along roadside banks and about plantations, Raumati, Wellington Province, 1952 (78755). Immature material, belonging to this or a closely allied species has been collected: established coastal scrub, near Mangonui, 1950 (82634); reported as troublesome and spreading rapidly by means of underground stems, Silverdale, North Auckland, F. W. Bartlett, 1950 (89502); coastal forest, near Akaroa, 1955 (91477).

**Passiflora edulis* Sims (Passifloraceae). Occurs in scrub, disused tram track, saddle between Mt. Young and Mangapiko, Great Barrier Island, R. Mason, 1949 (65734).

**Passiflora mollissima* (H.B.K.) Bailey (Passifloraceae). A rampant climber established about plantations and forest remnants, Raumati, Wellington Province, 1952 (82819); edge of bush Waikananae, R. Mason, 1949 (65620); margin of *Pinus* plantations, Ruby Bay, near Motueka, Nelson Province, 1947 (82820). This species occurs as an escape in many North Island localities, and in the Marlborough Sounds and Nelson districts, usually about plantations and forest margins.

**Pentaglottis sempervirens* (L.) Tausch. (Boraginaceae). Escaped from cultivation and forming colonies on roadsides and in waste land; Taita, Hutt Valley, 1953 (82643); Karori, Wellington, H. H. Allan, 1937 (19117); Cheviot, 1944 (33604); Rotherham, 1946 (82658); Lincoln, F. C. Allen, 1954 (83347); Tapanui, J. W. Woodcock, 1941 (25111); Woodside, Otago, R. Mason, 1951 (71738).

Pernettya mucronata (L.) Gaud. (Ericaceae). Spreading within cemetery, with occasional plants in scrub on adjacent properties, Palmerston, Otago, 1957 (98592).

**Phaseolus coccinea* L. (Papilionaceae). Established on river banks, Wanganui, I. W. Davey, 1944 (50111); waste land, Brighton, Christchurch, 1955 (89558); Dunedin, 1957 (98614). Stated to occur elsewhere about Wanganui, and observed by the writer as occasional about rubbish dumps and river banks where garden refuse is deposited, persistent, but scarcely spreading. The form with white corolla has also been collected at Brighton, 1955 (89561).

**Phlox drummondii* Hook. (Polemoniaceae). Casual on reclamation, McCormack's Bay, Christchurch (var. *rotundata* Voss), 1956 (92137).

**Phlox paniculata* L. (Polemoniaceae). Occasional as a garden escape on roadsides and in cracks of gutterings and footpaths, Riccarton, Christchurch, 1955 (91534).

**Phlox subulata* L. (Polemoniaceae). Noted by Bailey (1947: 2590) in North America as ". . . runs wild in patches along many roadsides, in cemeteries, and elsewhere", this species was found established on rocky banks and in grass on slopes near the Hutt River, Akatarawa, 1953 (84299).

**Phygelius capensis* Meyer (Scrophulariaceae). Escaped and spreading on roadside, Whakataki, near Castle Point, Wairarapa, L. B. Moore, 1937 (51958).

**Pisum sativum* L. (Papilionaceae). Casual about loading banks, railway goods sheds and permanent way, seed-cleaning plants and waste places: Upper Hutt, 1946 (58689). The field pea, with coloured corolla (var. *arvense* (L.) Poir) is the more common in the adventive state: Ashley River, near Rangiora, 1957 (92203); Christchurch, 1954 (85743); Temuka, 1956 (92215); Timaru, R. Mason, 1945 (51383); Cromwell, H. H. Allan, 1944 (14884); Puketeraki, Otago, K. W. Allison, 1954 (89553).

**Polygonatum x hybridum* Brügg. (Liliaceae). Several colonies established on overgrown, cut-over *Pinus* plantation area, Ashburton River, near Ashburton, 1956 (98612). This or a closely related plant, found only in the non-flowering stage, occurs as a persistent and spreading garden outcast on damp banks near the cemetery, Tapanui, 1956 (89632).

**Polygonum capitatum* Hamilt. (Polygonaceae). Recognized by the prostrate then ascending flowering stems, the usually reddish tinged leaves with dark central marking, auriculate petioles, globular reddish inflorescences and peduncle beneath inflorescence glandular-hairy, this Northern Indian species occurs as a garden escape

in the North Island: thoroughly established on coastal cliffs near site of old mission station, Te Waitere, south end of Kawhia Harbour, 1947 (79736); gutters, Napier, 1945 (58498); footpaths, Wellington, 1944 (48186). There is an undated specimen, without locality [almost certainly from the Auckland district], *M. Hodgkins* (2048) bearing the note "A common garden escape on rocks, rock walls, roadsides and banks"; this latter statement correctly describing the typical habitats of the species as an adventive.

**Polygonum orientale* L. (Polygonaceae). Noted as a garden escape, Palmerston North, *Department of Agriculture*, 1943 (36181).

**Polygonum polystachum* Wallr. (Polygonaceae). A vigorous and troublesome escape of roadsides and town sections, especially in south of South Island: Masterton, collector not stated, 1930 (2055); Taita, Hutt Valley, 1953 (83250); Reefton, 1947 (84134); Mt. Cargill, Dunedin, *K. W. Allison*, 1957 (98569); Dunedin, *J. W. Woodcock*, 1940 (45262); St. Leonards, Dunedin, *R. Mason and N. T. Moar*, 1952 (76795); Kaikorai Valley, Dunedin, *R. Mason and N. T. Moar*, 1952 (74855); between Invercargill and Kennington, 1956 (89633).

**Populus alba* L. var. *pyramidalis* Bunge (syn. *P. bolleana* Lauche) (Salicaceae). Established on roadside and waste land, near Fairlie, 1957 (98649).

**Prunus cerasifera* Ehrh. (Rosaceae). Occurs as isolated trees, occasionally in colonies, about bush margins, along streams, on roadsides and railway reserves; Bunnythorpe-Whakarongo, Manawatu district, 1953 (83244); Upper Hutt, 1953 (83236); Trentham, Hutt Valley, 1953 (84295); Riccarton, Christchurch, 1954 (91417); Christchurch, 1954 (88970); Ashburton, 1954 (89521); Waikouaiti, 1954 (88438).

**Prunus lauro-cerasus* L. (Rosaceae). Occurs about forest margins and in remnants of damaged forest in vicinity of settlement, commonly associated with one or more species belonging to genera with bird-dispersed fruits—*Cotoneaster*, *Crataegus*, *Ilex*, *Ribes* and *Rubus*: Botanic Gardens, Wellington, *R. Mason*, 1948 (63688); Upper Hutt, 1953 (82630); Riccarton, Christchurch, 1954 (83280); Dunedin, 1954 (83253).

Seedlings of this species were abundant on the site of a burned orphanage, in Upper Hutt, for several years, but they failed to compete successfully with *Buddleia davidi*, *Betula* sp. and *Ribes glutinosum*, and after five years, none had survived.

**Prunus mahelab* L. (Rosaceae). Coming in freely on gully sides and in small gullies in heavy *Leptospermum*, Tapanui, *K. W. Allison*, 1950 (82829).

**Pyracantha angustifolia* Schneid. (Rosaceae). Occasional on roadside and in mixed *Cytisus-Leptospermum-Ulex* scrub on sunny hill faces, Wallaceville-Upper Hutt district, 1954 (84279).

Pyrus communis L. (Rosaceae). Thomson (1922: 408) writing of the pear states: "It has not gone wild anywhere in New Zealand", and Allan (1940: 287) cites it by name only. This species has much the same range of distribution as *Malus sylvestris* along road and railway reserves, but is much less common, almost always as single trees.

Ranunculus ficaria L. (Ranunculaceae). First recorded as adventive by Calder (1948: 88)—"A small buttercup with smooth rounded leaves up to one inch across. The roots have several fig-like tubers. Not uncommon in damp pastures in both islands." My observations over a period of years do not confirm the above statement of habitat, and nowhere has the species been seen as a weed of pasture with similar status to that of such other adventive species as *R. acris*, *R. repens*, *R. flammula* and *R. sardous*; it is rather a garden outcast or escape found about gardens, in hedgerows, waste land near gardens, roadsides, about rubbish dumps, and damp, dark gullies as about Wellington City. Two varieties occur in New Zealand—var. *fertilis* Clapham: ditchbanks and roadside, under willows, Feilding, 1953 (82818); garden weed, Ngaio, Wellington, *M. E. Roberts*, 1950 (79756); in grass on roadside, Ngaio, Wellington, *R. Mason*, 1950 (70312); under trees along Avon River, Christchurch,

1954 (91416); under trees in forest remnant, Dunedin, 1954 (91437); var. *ficaria* Marsden-Jones: in grass, damp ground under willows, Hutt River, near Trentham, 1953 (84280).

**Rhododendron ponticum* L. (Ericaceae). In 1951 C. M. Smith, Director of the Botany Division advised that a species of *Rhododendron* occurred in scrub on pakihī land, near Waitahu, Reefton, and that it flowered freely, survived firing, and that seedlings were present. Thanks to the efforts of A. L. Poole, Assistant Director, New Zealand Forest Service, flowering specimens of the plant were secured by C. O. Scrivens, Forest Ranger, in 1955 (89540, 92108), and were found to agree most nearly with *R. ponticum*.

**Rhus typhina* L. (Anacardiaceae). A persistent and occasionally slowly spreading species on sites of old homesteads and roadsides in North Island: Upper Hutt, 1954 (85719).

**Rosa rugosa* Thunb. (Rosaceae). Collected in waste land, Balclutha, R. Mason and N. T. Moar, 1952 (75832).

**Rosa spinosissima* L. (Rosaceae). Established in cemetery, with occasional plants in *Cytisus* in adjacent areas, Roxburgh, 1957 (89589).

Rubus caesius L. (Rosaceae). This species provides an example of a plant not formally recorded in botanical literature in New Zealand, yet formally proscribed in local legislation, the name having been included in noxious weed enactments over the last thirteen years.

Historically, the position was that the name was added to the Second Schedule of the Noxious Weeds Act, 1928, by an Extension Order (1943/22) in 1943 based apparently on identification of specimens from the Whakatane district. The plant was not, however, declared noxious in the particular district by the local authority concerned, and when the noxious weed legislation was revised subsequently the name was omitted from the schedule of species in the new Noxious Weeds Act, 1950. The name was later added to the schedule of the Act by Gazette notice (Serial No 1952/67 of 3rd April, 1952).

I have not seen the specimens which were the basis of the 1943 addition to the schedule, but have examined the following specimens from the Tauranga-Whakatane district: Tauranga, M. Hodgkins, 1940 (45336); Te Puke-Matata, K. W. Allison, 1940 (36684); Pongakawa, K. W. Allison, 1943 (44748); Pongakawa, 1945 (33796)

**Schizostylis coccinea* Backh. et Harv. (Iridaceae). Persistent and spreading near deserted garden, Karori, Wellington; 1945 (33935) roadside, Kaitaia, H. G. Halliwell, 1955 (89504, 89510).

**Scilla non-scripta* (L.) Hoffmg. et Link (Liliaceae). A persisting and spreading garden outcast on roadsides and grassy waste places about settlement, both bluish and white flower forms being observed: Terrace End, near Palmerston North, 1953 (83199); Akatarawa, Hutt River, 1953 (82845, 84312); Upper Hutt, 1953 (83224); Heretaunga, Hutt Valley, 1953 (82844); Melling, Hutt Valley, 1953 (84244); Wellington, R. Mason, 1953 (81794); Ashley River, near Rangiora, 1956 (98635); Riccarton, Christchurch, 1954 (83349); Fendalton, Christchurch, 1954 (89504); Ashburton, 1956 (95043).

**Scilla peruviana* L. (Liliaceae). Colonies found in grass on roadside, north of Ashburton, 1956 (95046) This species has been observed in a similar habitat at Temuka and Rakaia.

Silene armeria L. (Caryophyllaceae). Recorded originally by J. B. Armstrong (1880: 353) for Canterbury, this record was not taken up by later workers. The species has been found as a garden escape in several North Island localities and is occasional in waste land about Christchurch: Paiaka *Phormium* area, Shannon, T. W. Rawson, 1948 (61825); stony roadside, Upper Hutt, 1953 (81992); in shingle and amongst rocks along creek, Riccarton; waste land, Bryndwr, Christchurch, 1957 (92208).

There is a sheet in the Botany Division herbarium lacking collector and date but with the note "Fields and roads, north of Christchurch", which may be the basis for Armstrong's record.

**Solanum capsicastrum* Link (Solanaceae). Closely related to the previously recorded *S. pseudo-capsicum* L., this species has been confused with it in New Zealand, and the distribution covers both species. The two species appear to occur in similar habitats, and have much the same general aspect, but *S. pseudo-capsicum* is glabrous, and *S. capsicastrum* pubescent with stellate hairs: Maewa, near Feilding, 1953 (83243); Upper Hutt, 1953 (83232); Motueka, 1944 (44746) [this specimen was earlier recorded by Healy (1944: 227) under *S. pseudo-capsicum*].

**Solanum jasminoides* Paxton (Solanaceae). Established in scrub, shady aspect, on hillside, Belmont, Hutt Valley, 1953 (82652); amongst willows and bushes, Grove-town, Marlborough, R. Mason, 1955 (88721).

Sorbus aucuparia L. (Rosaceae). Recorded originally by Smith (1904: 225) from Ashburton County (as *Pyrus aucuparia* [auct. ?]), the record has been neglected by subsequent workers. The species occurs about plantations, forest margins and remnants, and waste land in localities in Canterbury and Otago: forest remnant, seedlings abundant, Riccarton, Christchurch, 1954 (91496); roadside, near Mt. Peel, South Canterbury, T. W. Rawson, 1954 (94069); not uncommon about Fairlie, 1957 (98596); common in spontaneous *Larix* communities on abandoned sluiced areas, Naseby, 1956 (89644).

**Symphoricarpos orbiculatus* Moench. (Caprifoliaceae). Persistent and spreading slowly in swampy land, Wallaceville-Trentham, Hutt Valley, 1952 (78739). Probably originating at this site from bird-dispersed fruits, and now spreading by means of rhizomes. The species is noted as escaping from cultivation, in the United States by Bailey (1947: 3293).

**Tecomaria capensis* Seem. (Bignoniaceae). Noted as spreading from hedges and established on roadsides and waste places in North Auckland: Maungatoroto, Dargaville, Rawene, Kaitaia, Ohacawai, Taipa, Mangonui, Russell, Kerikeri Inlet, Kawakawa and Whangarei.

**Tetrapanax papyriferum* C. Koch (Araliaceae). Escaped and sparingly established in waste places, in scrub, and about forest remnants in North Island: Waimate North, Kohukohu, Parua Bay, Ngururu, Tauranga; collected from between Andrews and Melling, Hutt Valley, 1953 (84289).

**Tradescantia virginiana* L. (Commelinaceae). The typical violet-purple form and the white form (f. *albiflora* Britt.) occur as persisting garden outcasts, waste land, Christchurch, 1955 (92092, 92093).

**Tropaeolum speciosum* Poepp. et Endl. (Tropaeolaceae). Occurs scrambling through *Rubus* and *Ulex*, Te Marua, Hutt River, 1953 (84670); Belmont, Hutt Valley, D. W. Filmer, 1946 (65887); Belmont, Hutt Valley, I. W. Davey, 1946 (33991); scrambling over shrubs and trees, abandoned homestead, Taita, Hutt Valley, 1953 (91444); forest remnant, Riccarton, Christchurch, 1954 (91556); bush remnant, Pleasant Valley, South Canterbury, R. Mason, 1945 (33844); abundant through forest remnants, about forest margins, and in scrub, Otatara, near Invercargill, 1956 (33992); windswept coastal scrub, Ocean Beach, near Bluff, 1956 (92113).

Ulmus campestris L. (Ulmaceae). The first record of *Ulmus* as adventive is that of Simmons (1918: 335), where he states that "Elms have spread by suckering, and become troublesome weeds, . . .", and *U. campestris* L. was recorded by name by Allan (1940: 292). The distinct variety *suberosa* (Ehrh.) Gürcke has been noted forming colonies on roadsides and waste land: Upper Hutt, 1954 (68045); Riccarton, Christchurch, 1954 (83266).

**Veronica austriaca* L. (Scrophulariaceae). Scrappy specimens almost certainly of this species, were collected from the Motu Bush locality, Bay of Plenty, McLean, date not stated (48477). The plant was stated to be established there at the time, but it has not proved possible to secure either further information or specimens.

It is noted here in order that botanists in the locality in the future might search for it.

**Viburnum tinus* L. (Caprifoliaceae). Occasional about margins of plantations and damaged forest remnants: Riccarton, Christchurch, 1954 (89513); Town Belt, Dunedin, 1954 (83277). Plants at all stages were observed in these two occurrences, as also about Seacliff, Otago.

Vinca major L. (Apocynaceae). The distinct form with variegated leaves has been noted as a persisting garden outcast in localities in both islands: Hutt River, near Upper Hutt, 1953 (8272); Blenheim, 1955 (89554); Ashburton, 1956 (92168).

Viola odorata L. (Violaceae). First recorded by Kirk (1878a: 370) from the Wellington district—"Ohariu; probably planted", and later by Smith (1904: 216) from Ashburton County, Thomson (1922: 379) stated that he recorded the species ". . . innumerable attempts have been made to naturalise it in the open, but they have never succeeded."

The species has escaped and established, in both the blue and white colour forms: under *Crataegus* in hedgerows, Upper Hutt, 1953 (83200); on floor of forest remnant, Upper Hutt, 1953 (83234); in grass on open roadside, Wallaceville, Hutt Valley, 1953 (83204); in clearings in forest remnant and under *Quercus*, Riccarton, Christchurch, 1954 (91420). A. Porter, Superintendent of Parks and Reserves, Upper Hutt, advises that the species, commonly in the white-flowered form, is established in similar habitats in the Taumararui district, and also occasional on banks of road cuttings.

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A. J. HEALY,
Botany Division, D.S.I.R.,
Box 2015,
Christchurch, N.Z.