JOURNAL of the ADELAIDE BOTANIC GARDENS

AN OPEN ACCESS JOURNAL FOR AUSTRALIAN SYSTEMATIC BOTANY

flora.sa.gov.au/jabg

Published by the
STATE HERBARIUM OF SOUTH AUSTRALIA
on behalf of the
BOARD OF THE BOTANIC GARDENS AND STATE HERBARIUM

State Herbarium of South Australia
PO Box 2732
Kent Town SA 5071
Australia

Government of South Australia
Department of Environment, Water and Natural Resources

Board *of the* Botanic Gardens *and* State Herbarium

J. Adelaide Bot. Gard. 2(2): 195-220 (1980)

DR RICHARD SCHOMBURGK'S 'NATURALISED WEEDS' (1879)

P. M. Kloot

South Australian Department of Agriculture,
G.P.O. Box 1671, Adelaide, South Australia 5001

Abstract

The pamphlet entitled "On the Naturalised Weeds and other Plants in South Australia" (Schomburgk, 1879) is reprinted with detailed explanatory annotations. Suggested misidentifications and other errors are pointed out. Early records and other complementary data have been provided.

The place of the pamphlet in South Australian botany is discussed. It is shown that the text was amalgamated from earlier writings of Schomburgk and was heavily based on the 'Flora Australiensis' rather than contemporary field observations or reports. There were major omissions and other errors. A number of plants were included although they were at that time, and in some cases even since then, uncommon or even unknown in South Australia. Publication details, contemporary reviews and later developments are noted.

Introduction

One hundred years ago, Dr Richard Schomburgk, Director of the Adelaide Botanic Gardens, published a small pamphlet entitled "On the Naturalised Weeds and other Plants in South Austalia" (13 pp., Adelaide; Government Printer). This pamphlet was the first South Australian study of introduced plants and one of the first in Australia as a whole. At first glance, it would be expected that this paper should be regarded as a milestone in South Australian botany and possibly the foundation of all future such studies. In fact, at its publication, whilst it received approval from the lay press, it earned gentlemanly but nevertheless severe criticism from qualified reviewers. An expanded version was published ten years later (Schomburgk 1889) but the paper has been almost ignored ever since. However, at this distance we are so short of any contemporary account of the weed flora, that in spite of its inadequacies the paper must be carefully considered. The present paper is an attempt to interpret this pamphlet and to set it in its botanical and historical context.

The first part of this paper consists of a reprint of the pamphlet with explanatory annotations supplied by the present writer. The background, composition and reactions to this pamphlet are discussed in the second part.

Attention is drawn to typographical and orthographical errors, but errors in author citations, which are extensive, have not been considered, unless the error is relevant to some point under discussion.

ON THE NATURALISED WEEDS AND OTHER PLANTS IN SOUTH AUSTRALIA

[1]It is an historical fact that whenever man settles in a new country he not only carries the weeds that are most troublesome in cultivated ground along with him, but he also exercises a potent influence over the indigenous vegetation, especially when he engages in agricultural and pastoral pursuits. The plough, the axe, the flocks and herds, are enemies to the existing vegetation, and as cultivation advances each representant of the herbaceous flora, perennial and annual, succumbs to the foreign influence. But the plough, axe, and herds are not the sole destroyers of the native herbage, for with cultivation are introduced noxious weeds, and the new-comers, finding a suitable soil and climate, spread with alarming rapidity, and become possessors of the ground, ejecting the indigenous herbaceous plants, and taking their places.

From the past and present constant intercourse with Europe and other parts of the world, and the abundant importation of seeds into Australia for agricultural and horticultural purposes, it is no wonder that a very great number of the weeds most troublesome at home are now naturalised in South Australia.

Our temperate climate and soil suit their growth, and such atmospheric influences, as hot winds, unseasonable, &c., do not check their spread. Another cause of their extension is to be found in the extent of unoccupied ground, which is alone sufficient to account for the predominance and migration of so many of the worst European weeds. Some of these, viz.:- The Cockspur,[2] *Centaurea melitensis*, Linn.; the Bathurst bur, *Xanthium spinosum*, Linn.; the Scotch thistle, *Onopordon Acanthium*, Linn.;[3] the Variegated thistle, *Carduus Marianus*, Linn.;[4] the Stinkaster, *Inula suaveolens*, Jacq.;[5] the Sheep weed, *Lithospermum arvense*, Linn.;[6] and the Cape dandelion, *Cryptostema calendulacea*, R. Br.,[7] already cover immense tracts of pasture land, and extend farther and farther to the destruction of the native herbage.

Notwithstanding that thousands of pounds[8] have been expended legislation[9] has not succeeded in extirpating the most troublesome of intruders, viz., the Scotch thistle and Bathurst bur, the burs of which are so dangerous to the sheep from their fastening themselves in the wool so firmly as to be removed only with difficulty.

It remains to be seen whether the altered circumstances of the acclimatised weeds, which seem to be so favourable to their growth, will prove permanent, or, by an over-stimulation, a change gradually effected in the constitution of the intruders, bringing about degeneracy and subsequent extinction. But such an influence is not yet observable, for they extend farther and farther, and grow just as luxuriantly in the districts whence they spread as far back as from eighteen to twenty five years.

Grasses from other countries have also become domiciled in South Australia, which, no doubt, have materially improved the pasture near the coast.

---

1. This opening paragraph originally appeared in Schomburgk (1874) and reappeared in Schomburgk (1875, 1879, 1889).
2. Maltese cockspur.
3. Spear thistle, *Cirsium vulgare* (Savi) Ten. (see note 62).
4. *Silybum marianum* (L.) Gaertn.
5. Stinkwort, *Dittrichia graveolens* (L.) W. Greuter, (syn. *Inula graveolens* (L.) Desf.).
6. *Buglossoides arvensis* (L.) Johnston.
7. Capeweed, *Arctotheca calendula* (L.) Levyns.
8. One pound is nominally equivalent to two Australian dollars but because of inflation, one pound in Schomburgk's time had the spending power of about $40 today.
9. 1851 Act and 1862 Act (see note 67).

But not only weeds and grasses, but also cultivated garden plants, perennial and annual, begin to spread and become acclimatised in pasture land.

It will not, therefore, be uninteresting to give a list of both weeds and other plants naturalised in South Australia, and, as far as possible, the dates and particular circumstances of their introduction, in order, as Sir J. Hooker remarks[10], to record their increase and migration, and to afford to succeeding observers the means of comparing their future with their present condition.

DICOTYLEDONS

PAPAVERACEAE

Common Fumitory[11] - *Fumaria officinalis*, Dec.[12] A native of European introduction[13]: now a troublesome weed in gardens.[14]

CRUCIFERAE

Common Shepherds Burse[15] - *Capsella Bursa-Pastoris*, Moench and *Caps. procumbens* Fr.,[16] both well-known European weeds. Have been in the colony for the last thirty years[17] and have spread with rapidity, especially in abandoned places and on roadsides.[18]

Hedge Mustard - *Sisymbrium officinale*, Scop. A native of Europe. Has found its way probably from Tasmania,[19] and is now abundant[20]. Common and Narrow-leafed Pepperwort - *Lepidium sativum*, Linn. and *Lep. ruderale*, Linn.[21] Of European origin, an early introduction, spreading on roadsides and in abandoned places.

Watercress - *Nasturtium officinale*, R.Br.[22]. A native of Europe introduced about 1846[23], is now found in the streamlets near the coast.

Common Winter Cress - *Barbarea vulgaris*, Linn.[24] A well-known European plant, found near the coasts, and considered by some to be an introduced plant, but also said to be evidently indigenous.

---

10. Hooker (1860, p. cv).
11. Now usually placed in the separate family Fumariaceae.
12. This name was used loosely to cover a number of *Fumaria* spp. including *F. officinalis* L.s.s. On the basis of existing herbarium specimens *F. densiflora* DC., *F. muralis* Sond. ex Koch and *F. officinalis* L. are known to have been present in South Australia at the time.
13. *F. officinalis* was collected by Mueller in Adelaide c. 1850 (MEL!). The same species was listed as growing in the Adelaide Botanic Gardens in 1859 (Francis, 1859).
14. Recorded by Bentham (1863) as a weed of cultivation.
15. Usually "purse".
16. Syn. for *Hymenolobus procumbens* (L.) Nuttal ex Schinz & Thell.
17. *C. bursa-pastoris*, was collected by Mueller about Adelaide in July 1848 and *H. procumbens* was collected by Mueller at Wellington in October (both specimens at MEL!).
18. The latter species was considered to be native by Tate (1890) and Black (1924, 1948).
19. In grain or attached to fleece.
20. A sheet collected November 1848 by Mueller (MEL!), is annotated - "In waste places and roadsides about Adelaide".
21. Neither of these species are present in South Australia apart from a record of *L. campestre* (L.) R.Br. (Black, 1920) associated with experimental flax plots near Penola, which appeared as *L. sativum* L. in Black (1948). *L. ruderale* was incorrectly used by Mueller for the native species *L. hyssopifolium* Desv., *L. pseudo-ruderale* Thell. and *L. fasciculatum* Thell. (Black, 1948; Eichler, 1965). The locations given by Schomburgk are typical of some of the present habitats of *L. hyssopifolium*.
22. Syn. for *Rorippa nasturtium-aquaticum* (L.) Hayek.
23. This species collected by Mueller from R. Torrens c. 1850 and from Crystal Brook in November 1851. A second species, *R. islandica* (Oeder) Borbas, was collected by Mueller on a number of occasions from 1847 onwards. This was recorded as a native by Bentham (1863) as *N. palustre* DC. (syn. *R. terrestre* R. Br.). Eichler (1965) corrected its status, noting it as a native of Europe and West Asia.
24. This species does not occur in South Australia and there is no other evidence that it ever has. It is suggested that this was a misidentification of *Sisymbrium orientale* L. which it superficially resembles.

CARYOPHYLLEAE[25]

The weeds of this order, except the first, are not dangerous, as they are eaten by cattle and sheep and only troublesome in gardens.

French Catchfly - *Silene gallica*, Linn. A native of South France. This troublesome weed found its way to South Australia about twenty-five years ago,[26] and spread most rapidly, especially in poor, sandy agricultural land[27] and waste places. The cattle will only eat it when pressed by hunger.

Chickweed - *Stellaria media*, Dec. Is a well known native of Europe, and an early introduction[28]. This troublesome weed is ubiquitous in gardens and is also met with in the fields.

Thyme-leaved Sandwort - *Arenaria serpillifolia*, Linn.[29] A native of Europe and North America. Has been naturalised[30] in South Australia for more than twenty years.

Common Mouse-ear Chickweed - *Cerastium vulgatum*, Linn.[31] From the South of Europe and introduced in the early days[32] of the colony.

Corn Spury[33] - *Spergula arvensis*, Linn. This well known cornfield weed at home, which has made its appearance in South Australia within the last twelve years[34]. *Spergula rubra*, Pers.[35] is also spreading fast near the coast[36].

Gypsophylla tubulosa, Boiss. A native of the Mediterranean, which was introduced in the early days of the colony[37].

PORTULACEAE[38]

Oleraceus Purslane - *Portulaca oleracea*, Linn. Known in the early days of the colony, and a very troublesome weed in gardens during the summer months. By some considered to be indigenous[39].

---

25. Caryophyllaceae.
26. In fact specimens were collected by Mueller from the Mt Lofty Ranges in 1848 (MEL!). A specimen in AD! collected by Tepper *s.d.* is annotated "Introduced by first settlers about 1840". Probably introduced in contaminated grain.
27. Used for cereal-growing in the early days.
28. Collected by Mueller near Adelaide in 1848. A congener *S. palustris* Retz. (syn. *S. glauca* With.), appears to have been more widespread even in Mueller's time.
29. A specimen in MEL collected at Clare village in 1851 identified as this species has since been redetermined as *A. leptoclados* (Rchb.) Guss., which is also naturalised in S.A.
30. Bentham (1863) records it as "now almost naturalised". Specimens in MEL! and AD! suggest that *Arenaria* spp. only became common later. It is not certain which species Schomburgk is referring to, but it may be *Polycarpon tetraphyllum* (L.) L. which has been recorded widely since early settlement.
31. Syn. of *C. glomeratum* Thuill.
32. Collected widely by Mueller in South Australia in 1848 (MEL!).
33. Currently spelt "spurry".
34. Actually it had been collected by Mueller at Macclesfield in 1848 (MEL!), where it had probably contaminated cereal grain for sowing.
35. In error for *Spergularia rubra* (L.) J. & G. Presl.
36. Both *S. rubra* and *S. media* (L.) Presl. (syn. *S. marginata* (DC.) Kittel) were collected widely by Mueller from 1847 onwards (MEL!).
37. This species is not known from South Australia. That being referred to is a native, *G. australis* (Schldl.) A. Gray.
38. Portulacaceae.
39. The introduced weedy form found mainly in southern areas differs in appearance from the apparently indigenous native form. The earliest specimen located of the introduced weedy form is *Tepper 1210*, Ambleside, 1885 (AD!). However as cultivated forms of the species were already growing in the Botanic Gardens by 1859 (Francis, 1859), it is possible that it had already become well established, but not collected, by 1879.

GERANIACEAE

Hemlock-leaved Heron's Bill - *Erodium cicutarium*, L'Her. A native of Europe, Africa and Asia; was introduced early[40] and has widely spread in the colony, especially in pasture grounds. Cattle and sheep are fond of it[41].

Drooping Yellow Woodsorrel[42], called in the colony Sour-sop[43]. - *Oxalis cernua*, Thunb.[44] A native of the Cape of Good Hope, and introduced into the colony about 1840 as a garden plant[45]. What the black oats[46] are to the wheat fields, the *Oxalis cernua* is to the gardens. The effects of this scourge are strikingly apparent in every garden where it has been planted, and has notorious pre-eminence over all weeds introduced, since it is next to impossible to eradicate when it has obtained a footing. The young bulbs penetrate every year deeper into the ground, often two feet, and so multiply that every young plant will produce next year from twenty to thirty bulbs, until the ground is matted over, and all other herbage choked.

Experiments[47] were made in burying the plants from three to four feet deep but the young bulbs came up the next year. It has found its way into the wheat fields, and spreads there most alarmingly.

It is said that the first bulbs were sold in the colony at 2s 6d. per bulb[48].

LEGUMINOSAE

The following introduced fodder-plants[49] have also spread over some of the pasture lands, improving them materially viz:-

White Clover[50] - *Trifolium repens*, Dec.
Golden-flowered Clover[51] - *Trifolium agrarium*, Dec.[52]
Common Clover[53] - *Trifolium pratense*, Dec.
Small-flowered Melilot[54] - *Melilotus parviflorus*, Desf.[55]
Lucerne - *Medicago sativa*, Dec.[56]

---

40. Collected by Mueller c. 1850; so widespread that it was considered native by Bentham (1863).
41. A congener *E. moschatum* (L.) L'Her. ex Ait. was also collected by Mueller in 1848. Bentham (1863) notes that it was established as a weed. This species was grown in the Adelaide Botanic Gardens (Francis 1859).
42. Now placed in the separate family *Oxalidaceae*.
43. The common name changed from "soursop" to "soursob" about 1900 for unknown reasons, but the former name persisted until World War II.
44. Syn. for *O. pes-caprae* L.
45. First recorded as flowering in the old Botanic Gardens in June 1841 (Bailey, 1841).
46. *Avena fatua* L. See note 140.
47. In the Botanic Garden.
48. 2s 6d. is equivalent to 25¢ but in real value probably over $5! (See note 8.) The source of Schomburgk's assertion is not known.
49. Apart from white clover and lucerne, the other species are considered to be inferior pasture legumes which thrive under low soil phosphate conditions. Where phosphatic fertilizer is used, better producing species are available.
50. Introduced by very earliest settlers (Capper, 1838) who were attempting to establish the white clover/perennial grass pastures with which they were familiar in Britain and northern Europe generally.
51. Current common name is hop clover.
52. *T. agrarium* Huds. is a *nomen ambiguum*. The correct name is *T. campestre* Schreb. (syn. *T. procumbens* L.) Recorded as naturalised in S.A. by Bentham (1863) but no specimens have been located. A Tate specimen of 1877 at AD (!) originally identified as *T. agrarium* is *T. tomentosum* L.
53. Current common name is red clover which is not well adapted to South Australia and is rather uncommon. It is not certain which species is really meant. A highly speculative suggestion is cluster clover (*T. glomeratum* L.) which has pink globular flowers and has been widespread since last century.
54. Commonly known as melilotus or King Island melilot. Collected by Mueller in 1847 (MEL!).
55. Syn. for *M. indica* (L.) All.
56. Recorded as growing in the old Botanic Gardens in 1841 (Bailey, 1841) and collected by Mueller at North Adelaide in 1848 (MEL!).

Toothed Medick[57] - *Medicago denticulata*, Willd.[58]
Common Vetch[59] - *Vicia sativa*, Linn.; and *Vicia hirsuta*, Fisch. Natives of Europe and N. America.

UMBELLIFERAE

Common Fennel - *Foeniculum vulgare*, Linn. A native of Europe. This useful medicinal plant was introduced at an early date[60], and has spread amazingly over the country[61], especially on the banks of creeks and water-courses, growing to an immense size, often four to six feet high, forming thickets and choking the herbaceous plants.

COMPOSITAE

The order has supplied the most troublesome of the introduced weeds[62]. Scotch Thistle - *Onopordon Acanthium*, Linn.[63] A native of Europe. Made its appearance in the south, at Cape Jervis, about 1845[64], and has since spread extensively over the country. It prefers a rich soil, and shows such a luxuriant growth that in some places it has formed impenetrable thickets, throwing up flowerstalks of from four to six feet high, and destroying the native herbage entirely. Plants have been seen as far as two hundred miles north, for the winged seeds can be carried a great distance if they are taken up by the whirlwinds[65].

Cattle and sheep do not eat the plant, and its extension became so rapid and injurious to the pasture lands[66], that the Legislature, on October 21st, 1862, passed an Act[67] for preventing the further spread of the Scotch thistle, including two other noxious foreign weeds equally dangerous to the herbage, viz., the variegated thistle, *Carduus Marianus*, Linn.[68], and the Bathurst-bur, *Xanthium spinosum*, Linn.

According to the Act every owner or occupier of land upon which, or upon the adjacent half of any road, the above-mentioned thistles are growing is obliged, in twenty-one days after notice, signed by any Chairman of a Road Board or District Council[69], has been served upon such owner, to destroy the thistles on his land, otherwise he is liable to a penalty not exceeding ten pounds. The Government must, on all unoccupied Crown

---

57. Burr medic - probably introduced by the earliest settlers in sheep's fleeces. Collected by Mueller by R. Torrens in 1848 (MEL!).

58. Syn. for *M. polymorpha* var. *vulgaris* (Benth.) Shinners.

59. There is a newspaper reference to vetch (*V. sativa*) in 1845 and *V. angustifolia* L. was collected by Mueller on the plains between Adelaide and Gawler in 1847 (MEL!). It was recorded by Bentham as *V. sativa* var. *segetalis*. *V.hirsuta* was collected by Mueller in the Bugle Ranges in 1850 (MEL!). It is not a very common species.

60. This plant was being grown in the Adelaide Botanic Gardens in 1859 under this name and also as *Anethum foeniculum* L., but it was recorded as being introduced before 1856 (Francis, 1859).

61. Collected by Tate at Fifth Creek in September 1880 (AD 97619229!) and noted as growing wild around Adelaide, chiefly on the banks of watercourses (Garden and Field (1882), 7:164).

62. The first noxious Weeds Acts were aimed entirely at species of Compositae.

63. This species is very rare in South Australia and always has been. The species referred to, is spear thistle, *Cirsium vulgare* (Savi) Ten. (syn. *C. lanceolatum* and *C. lanceolatus*). It is also locally known as black thistle.

64. A. Molineux in 1879 recalled that the first time he saw the plant was close to the residence of the Governor of the gaol on the banks of the Torrens in 1841 (Garden & Field (1879) 5: 92). The banks were grazed so it is likely to have been introduced in sheep's fleece or perhaps fodder from Tasmania where it was an early introduction (Bentham, 1867).

65. This may be so, but a more prosaic explanation could lie in the observation that they were common along railway lines (Garden & Field (1875) 7: 182).

66. By 1850 it was reviled as an "atrocious thistle, (the) curse of the Colony" (Yelland, 1970).

67. This was in fact the second such Act. The first "An Act for preventing the further spread of the Scotch Thistle" was enacted in December 1851 and received Royal Assent on January 2, 1852. The 1862 Act repealed the earlier Act and among other things included Bathurst burr, *Xanthium spinosum* L. as a noxious weed.

68. Syn. for *Silybum marianum* (L.) Gaertn. The plant was also known locally as *C. benedictus* which is an entirely different species, never recorded from South Australia.

69. Or a number of other designated officials.

lands, employ the necessary labor to eradicate the thistles. This stringent measure, it is true, has decimated the plants, but without effecting the object desired. Although thousands of pounds[70] have been spent for the purpose, the destruction of thistles is generally commenced too late[71] to prevent the dispersion of the developed seed.

Variegated Thistle - *Carduus Marianus*, Linn.[68] a native of South Europe also wrongly styled Scotch Thistle[72], is said to have been introduced as a garden plant in 1846[73], and has spread to the same extent as the foregoing. In good soil it will grow from four feet to seven feet high. The only advantage it has, is that it is eaten by the cattle when young.

Bathurst Bur[74] - *Xanthium spinosum*, Linn. A native of South and West Europe[75], is as dangerous a weed as the sheepfarmers have to contend with. It was first observed in the colony about 1850[76], and for the first few years it was confined to the roadsides and the reserves used for travelling stock, but it spread from thence with alarming rapidity into the interior, assisted by the sheep and horses, in whose wool, and manes and tails, the bur is carried about and spread in all directions. It is said that as many as a hundred burs have been taken off the head of a sheep. The bur adhers so tenaciously to the wool until it is shorn, that it is difficult to pull it off without pulling the wool with it, and so it depreciates the value of the fleece 2d. to 3d. per pound[77].

Artichoke - *Cynara scolymus*, Linn.[78] A native of South Europe, has been introduced about twenty-five years[79]. It has found the South Australian climate so genial that it begins to spread throughout the colony[80]. It is found especially on the banks of rivers and creeks. It grows in good soil to an enormous size, choking, like the variegated thistle, the surrounding herbage.

Cockspur[81] - *Centaurea melitensis*, Linn. A native of the Mediterranean region, was introduced as far back as 1844[82], and has spread with rapidity, over cultivated as well as waste ground and pasture land, and appears abundant in various parts of the colony[83]. Like the Bathurst bur, it was first observed on the roadsides, and the wind, as is the case with most of the compositae, carries the winged light seed to a great distance. Stock will eat the plants when young, but will not touch it after the appearance of the flower stalks. On fallow and pasture land it forms thick swaths, and chokes the more tender indigenous herbs.

---

70. See note 8.
71. This comment is equally true today and it applies to all weeds.
72. The 1851 Act (Section 11) expressly states that "'Scotch Thistle' shall be held to mean and include ..... the variegated thistle ....."
73. No evidence exists for this date. It was known to be growing in the Adelaide Botanic Gardens in 1859 (Francis, 1859) but as it was included in the 1851 Act, it must have been naturalised and rampant by that time.
74. Nowadays spelt "burr".
75. Actually a native of South America and reputedly introduced to the Bathurst area of New South Wales about 1840 in the tails of horses imported from Valparaiso, Chile, (Anon., 1852).
76. It did not warrant attention from the 1851 Act but 11 years later was included in the 1862 Act.
77. A 25% reduction or greater in value.
78. In error for *C. cardunculus* L. *C. scolymus* is the botanical name for the globe artichoke, but in S.A. has been used interchangeably with *C. cardunculus* which is cardoon, a vegetable in its own right. Both species were early introductions to S.A. (Stevenson, 1839) but only *C. cardunculus* became naturalised.
79. It was already known by 1839 that the species grew well in Adelaide (Stevenson, 1839)
80. In 1881 it was recorded as being both naturalised and readily cultivated (Garden & Field 7: 116).
81. Now called "Maltese cockspur".
82. No evidence for this date has been found but it appears to have been common by c.1850 when it was collected around Adelaide by Mueller and Blandowsky (MEL!).
83. There are occasional references to its value as fodder when young and it is recorded as being deliberately sown in the scrub at Stansbury for sheep fodder in 1890 (Anon., 1890). It may have been used for this purpose earlier. Loudon (1855) lists it as an ornamental.

The following three species of Horse Thistle, viz., *Cirsium lanceolatum*, Scop., *C. palustre*, Scop., and *C. arvense*, Scop.[84], natives of Europe, also become troublesome to the agriculturists. It is said they have been introduced from Victoria and Tasmania.

Stinkaster[85] - *Inula suaveolens*, Jacq.[86] A native of South Europe is the most noxious and dangerous plant ever introduced[87]. Neither cattle nor sheep will touch it, and it increases with most alarming rapidity. This plague was first noticed in the Onkaparinga district[88] as far back as 1863, and it is said, was introduced with seed wheat from home[89]. Not knowing its dangerous character[90], no notice was taken of the plant until its fast spreading became apparent, and that no cattle would touch it, probably not liking the disagreeable odour the plant emits.

Its winged light seed flies with the prevailing winds to a great distance. It forms a thick swath, and smothers the indigenous herbage. The pasture land taken possession of by it becomes valueless, as the weed cannot be extirpated without heavy cost. Although only an annual, this useless plant is a prolific seed-bearer, and keeps its vitality for years. Thousands of acres of pastures land towards north and south, extending sixty to eighty miles from its starting point, has been taken possession of by this pest, and such lands are covered with this weed have a most desolate appearance.

In cultivated land it is not so dangerous; the seed begins first to germinate in September and October, and the young plants are choked by the growing crops; but the haylands suffer, because the young plants spring up after the hay has been mown.

Cape Dandelion[91] - *Cryptostemma calendulacea*, R.Br.[92] A native of the Cape. It was in the year 1850 that I first noticed a few isolated plants on the side of the road leading through the Gawler Plains[93]. The following year a few made their appearance on the banks of the Gawler River. From year to year it is rapidly taking possession of the pastures as well as cultivated land, and is now found quite two hundred miles towards the north from its starting point, covering even the untimbered mountain ranges to their summits. When in bloom the country presents a peculiar appearance, and as far as the eyes reach a yellow carpet only is seen. It is an annual, and although doing much harm to the more tender indigenous herbage, it is much liked by cattle and sheep, which eat it eagerly, preferring it even in a dry state to wheaten hay, and licking the large and very

84. It is uncertain which species are referred to here. *C. lanceolatum*, mentioned earlier, is a synonym of *C. vulgare*. *C. palustre* is a biennial, not known from S.A., and *C. arvense* is a perennial not recorded locally until 1888 (Anon., 1888). *Onopordon acaulon* L., stemless horsethistle, was a very early introduction as an ornamental and had escaped into the Adelaide Parklands by 1845 (Anon., 1897), so this species may have been intended.

85. Now known as "stinkwort".

86. Used in error for *I. graveolens* (L.) Desf. which is a synonym of *Dittrichia graveolens* (L.) W. Greuter.

87. This was the most serious weed of cereal growing areas around the turn of the century, but is a minor plant of little consequence today associated with infertile, waste land.

88. On the property of a Mr Spoehr, not far from the Balhannah bridge (W.C. Grasby, quoted by Maiden, 1920).

89. Germany.

90. Schomburgk, apparently upon identifying the plant, said "that it was a common weed in Germany and Central Europe, but not dangerous, and he persisted in this view for some time until the pest got a firm hold" (W.C. Grasby quoted by Maiden, 1920).

91. Now called "capeweed" although there is a local South Australian name "dandelion" which still persists widely. Presumably this is an abbreviated form of "Cape dandelion".

92. Syn. for *Arctotheca calendula* (L.) Levyns.

93. This was the area in which Schomburgk farmed at the time. However earlier records exist. According to A. Molineux it first appeared on the banks of the Torrens, 300 yd. (approx. 270 m) above the first dam in 1841. He knew it originally as "Cape marigold" (Garden & Field (1880) 5: 92). A report in 1882 records its introduction as "about 38 years ago", when it was introduced from the Cape as a fodder plant (Garden & Field (1882) 7: 116). Mueller noted it as frequent in places around Adelaide in 1848 (MEL!) and it was recorded as a common plant on the Adelaide parklands in 1862 (Farm & Garden (1862) 5: 21).

abundant seed from the ground. When in bloom many people consider it injurous to the lungs, from the inhalation of the pollen by which the air is impregnated. This circumstance may also be attributed to the moist atmosphere prevailing when the dandelion is in flower. Though the plant has taken possession of the land for the last twenty-five years, it grows as vigorously as ever, and it seems that over stimulation fails to bring about degeneracy and subsequent extinction. It is said that the plant was introduced from Tasmania[94].

Goat's Beard[95] - *Tragopogon porifolius*, Linn.[96] A native of Britain. With the last few years this weed, introduced from England[97], seems to have found a genial climate in South Australia, as it spreads everywhere, the profusely winged seeds being each carried about by the wind. Its large taproot, which proves to be an edible vegetable, takes hold in any soil[98]. The plants are eaten by cattle when young.

Chicory - *Cichorium intybus*, Linn. A native of Europe, and introduced into South Australia about sixteen years ago[99], and is now abundantly found growing on the roadsides, especially on the Brighton Road, and along the railway to Glenelg[100]. Although spreading fast in these places it will not become dangerous to our pasture lands, being a plant eaten eagerly by stock. As the plant has taken so well to our climate the culture of the chicory for manufacture would, no doubt, be a profitable undertaking.

Common Groundsel - *Senecio vulgaris*, Linn. Known here for the last sixteen years[101]. Becomes rather a nuisance in gardens, but improves pasture, as the cattle relish it much.

Golden Cornflower - *Chrysanthemum segetum*, Linn.[102] A native of Britain - probably introduced from Tasmania - also begins to spread much.

Common stinking Maruta[103] - *Maruta Cotula*. Dec., (*Anthemis Cotula*, Linn.)[104]. A native of Europe. From its unpleasant odour is not at all an agreeable addition to our flora[105]. It increases rapidly, as stock do not eat it.

Sow-thistle - *Sonchus oleraceus*, Linn., was introduced in the early days of the colony[106], and has become a very troublesome weed in cultivated ground just as obiquitious as we see it in the old country, and this is also the case with the two following species, viz.:

---

94. The earliest collections are from Western Australia from where it may have been introduced to S.A. but also see previous note.

95. Now called "oyster plant" or "salsify".

96. *Tragopogon porrifolius* L.

97. Recorded as growing in the Adelaide Botanic Gardens in 1859 (Francis, 1859).

98. Today it is an inconsequential weed of roadsides and waste places in moist areas.

99. Earlier records exist. It was sown as a pasture species in 1837 (Capper, 1838) and collected at Gawler River and Tanunda in 1848 by Mueller (MEL!).

100. Possibly remnants of the original plantings by the first settlers.

101. This species was being grown in the Adelaide Botanic Gardens in 1859 (Francis, 1859) but no specimens collected from the field last century have been located. However Black (1909) implies that it was widespread by the turn of the century.

102. This species is not known ever to have occurred in South Australia. Presumably some other yellow-flowered plant was misidentified. Both *Calendula officinalis* L. and/or *C. arvensis* L. particularly the former, could have been intended. Both species were collected by Mueller around Adelaide in 1848 (MEL!).

103. Known as "stinking mayweed".

104. The South Australian specimens are currently identified as *Anthemis cotula* L. In my opinion they appear to be *A. arvensis* L. Robertson (1957) has previously drawn attention to this possibility.

105. The earliest extant specimen is from 1881 collected by *Tepper 321* from riverflats and wet gullies at Clarendon (MEL!). Its inclusion here by Schomburgk is an error carried forward from earlier publications (Schomburgk, 1874, 1875) when *Anthemis cotula* was given in error as the botanical name for stinkaster i.e. *Dittrichia graveolens*.

106. Collected widely by Mueller between 1848 and 1850 (MEL!) to such an extent that he suggested that it was "perhaps truly indigenous".

Rough-leafed Sow-thistle - *Sonchus oleraceus*, Linn., var. *asper*[107]. A native of Europe; and the

Cornfield Sow-thistle - *Sonchus arvensis*, Linn.[108] A well known European weed.

PRIMULACEAE

Red-flowered Pimpernel[109] - *Anagallis arvensis*, Linn.[110] A native of Europe, Asia and N. America; has become settled as an introduced plant in waste and cultivated ground.

BORAGINEAE[111]

Corn Cormwell, known in the colony under the name of Sheepweed[112] - *Lithospermum arvense*, Linn.[113] A native of Europe and established in the colony for about fifteen years;[114] and in some districts spreading most alarmingly in the wheatfields, injuring the young wheat plants, by choking them entirely[115].

SOLANEAE[116]

Blackberried Nightshade - *Solanum nigrum*, Linn. This well-known European noxious weed, was introduced in the early days of the colony[117] - probably from Tasmania - and has spread with amazing rapidity in all directions far into the interior. Stock will not eat it.

Blackspined Nightshade[118] - *Solanum sodomeum*, Linn.[119] A native of the Mediterranean[120]. Has for the last two years been found growing in waste places and on rubbish heaps[121].

Light Blue Tornapple[122] - *Datura tatula*, Linn.[123] From the South of Europe. This noxious weed has during the last twenty years[124] appeared in South Australia in waste places, but especially on the banks of creeks and watercourses. A good many horses have already been poisoned by it, the plants having been mixed with the hay, and the seeds, the most dangerous part, having fallen into the manger.

---

107. *Sonchus asper* (L.) Hill, collected at Gawler by Mueller c. 1850 (MEL!).

108. This species is very rare in S.A. Possibly a native *Sonchus* sp. or subsp. or *Embergeria* sp. (see Eichler, 1965) was intended.

109. Known as "scarlet pimpernel".

110. Introduced as a garden plant very early and apparently well established by 1848 when Mueller collected both blue and red forms (MEL!).

111. Boraginaceae.

112. Cormwell is a misspelling of gromwell, a name used in other parts of Australia. Sheepweed is the generally used name in S.A. today.

113. Syn. for *Buglossoides arvensis* (L.) Johnston.

114. One specimen was collected by Mueller at Clare in 1851, possibly from a garden (MEL!). In 1875, it was noted as being common in neglected (Adelaide) suburban gardens (Garden & Field (1875) 1: 65). From 1875 it was collected widely (MEL!).

115. This may still apply where crops are late sown on a fine seedbed and no control measures are instituted.

116. Solanaceae.

117. Recorded as flowering in the old Botanic Gardens in 1841 under the name of *S. luteum*. (Bailey, 1841). Collected by Mueller in 1848 (MEL!) from the vicinity of Adelaide.

118. Now called "apple of Sodom".

119. Syn. for *S. hermanii* Dunal.

120. Introduced from Asia Minor into the Adelaide Botanic Gardens during the period 1856-59 (Francis, 1859).

121. First local specimen was collected c. 1880 by Tepper at Victor Harbor (MEL 14063!).

122. Thornapple.

123. Probably common thornapple, *D. stramonium* L. was intended, although *D. inoxia* Mill. and *D. wrightii* Regel were probably present by this time. The former species was the most widespread and *D. tatula* was used in error for *D. stramonium* (Haegi, 1976).

124. Bailey (1906) recalls children eating the plant and becoming very sick in Adelaide in 1839.

Common Henbane - *Hyoscyamus niger*, Linn.[125] This well-known noxious European plant has appeared since the last few years on rubbish heaps and abandoned places, as at home.

PLANTAGINEAE[126]

Ribgrass[127] - *Plantago lanceolata*, Linn.[128], *Pl. major*, Linn.[129], and *Pl. coronopus*. Linn.[130], all natives of Europe, were introduced early and have spread over the pasture grounds and have much improved the pastures, as the cattle and sheep eat it greedily.

POLYGONACEAE

Knotgrass, and bears the colonial name hogweed[131] - *Polygonum aviculare*, Linn. A native of Europe, is one of the first of the troublesome introductions[132], and is now spread over a large part of South Australia, and especially in cultivated land and gardens. It forms a thick matting, and chokes the surrounding herbage. Cattle and sheep relish it[133].

Sheep's sorrel - *Rumex acetosella*, Linn.[134], and the Curled Dock *Rumex crispa*, Linn.[135] Both dangerous European introductions, which monopolise cultivated land and gardens, to the entire exclusion of other herbs. They are not easily eradicated in consequence of their long roots penetrating deep in the ground, and if a small piece of one of these remain it will grow again[136].

EUPHORBIACEAE

Warbwort Spurge - *Euphorbia aviculare*, Linn.[137] A native of Europe has also found its way from Tasmania into South Australia, and is found growing on rubbish heaps and in abandoned places.

URTICEAE

Common and Small Nettle - *Urtica urens*, Linn., and *Urtica dioica*, Linn.[138] are said to have been brought over from Tasmania in the hay imported from there nearly forty years ago[139]. They are mostly found growing on rubbish heaps and in abandoned places, and become troublesome in gardens.

---

125. It is not known which species was meant. It was growing in the Adelaide Botanic Gardens in 1859 (Francis, 1859) but no herbarium specimens exist. The first collection was from Wolseley in 1921 (Black, 1935). Two later collections from Murray Bridge in 1927 and Jamestown in 1935 are recorded but it has not been collected since. It probably failed to become naturalized.

126. Plantaginaceae.

127. Ribgrasses were a favoured pasture species and were among the first species sown in 1837 (Capper, 1838). Although it is used here for three species, the true ribgrass of Britain is *P. lanceolata*.

128. This species was introduced into the Adelaide Botanic Gardens during the period 1856-59 (Francis, 1859). The earliest collection is from near the Torrens weir in 1879 (AD!). However in 1859 it was being advocated and sown successfully as a pasture species, seed being distributed by Mr Robert Davenport (Farm & Garden, (1859) 1: 200).

129. This is not, and appears never to have been, common in S.A. The earliest certain record is a collection found by the Torrens in 1879 (AD!).

130. This was collected at Holdfast Bay by Mueller in 1851 (MEL!). Other collections indicate that this was the most widespread species. It was the most successful introduction of *Plantago* by the early settlers.

131. In S.A. almost always called "wireweed".

132. Collected by Mueller in 1848 (MEL!). The sheet is annotated "on roads, waste places and cultivated land around Adelaide".

133. Recognised as being valuable summer feed (Farm & Garden (1859) 1: 153).

134. *R. acetosella* L. now considered to be a different species *R. angiocarpus* Murb. (see Eichler, 1965).

135. *R. crispus* L.

136. *R. angiocarpus* was collected in 1847 by Mueller who noted it as "rare". However by 1862 it was a problem in the Mt Gambier area for which advice was being sought (Farm & Garden (1862) 4: 115). By the 1890's it was a bad weed in many places enjoying high rainfall. *R. crispus* was collected in 1850 by Mueller from Mt Barker township where it was "adventive". No other early collections exist.

137. The only species of *Euphorbia* that was widespread was petty spurge, *E. peplus* L. which occupies the habitats described. The earliest extant specimens, however are those of J.M. Black collected after 1902 (AD!).

138. This is probably the native species *U. incisa* Poir. which is closely allied to *U. dioica*.

139. i.e. about 1840. It was collected "around buildings and sheds" in 1848 by Mueller (MEL!).

MONOCOTYLEDONS

GRAMINEAE

Black Oat[140] - *Avena sativa*, Linn., var. *melanosperma*[141] was undoubtedly either introduced with the original seed wheat from England, or from Tasmania[142], which latter we have to thank for the introduction of a number of noxious weeds, as in the early days of the colony a great deal of hay was shipped from thence to South Australia. The black oat has the most notorious pre-eminence of all the introduced weeds[143] and the effects of this intruder are most ruinous to the farming community, as it finds its way into all the cultivated land, and having once got a footing is the most troublesome weed to eradicate, its seed ripening and being shed some time before the wheat ripens. It is a fact that the seed lies six or eight years in the ground, if covered one foot with soil, but by next year's ploughing if the seed comes near the surface it will spring up so abundantly before the sown wheat does as to choke the young wheat plants. It is almost impossible to cleanse the land thoroughly foul with black oats in less than several years, even by repeated ploughings. The rapid increase of this injurious plant is an object of serious concern to the farming community. Thousands of acres of arable land, especially such as have been in cultivation for some years, are totally ruined by the black oats for the purpose of wheat growing. At the present time the yield of wheat of many of the farms is diminished quite by two-thirds, or one, in consequence of the black oats, and often the crops can only be used for hay.

Darnel Grass, or Drake - *Lolium temulentum*, Linn.[144], probably an introduction from Britain. In the cereal fields, also, this spreads with alarming rapidity, as the seeds mostly ripen and drop before the wheat harvest[145].

The following European grasses have also found their way to Australia, but are less dangerous to cultivation - in fact, they have improved the native pasture near the coast materially, viz:-

Wild Oatgrass[146] - *Avena fatua*, Linn. A native of Europe.[147]
Early Flowering Hairgrass - *Aira praecox*. Linn.[148] A native of Britain.
Sweetscented Springgrass[149] - *Anthoxanthum oderatum*, Linn.[150] A native of Europe[151].

---

140. Generally known as wild oats, although the name "black oats" is occasionally used.
141. Syn. for *A. fatua* L.
142. According to a report in 1858, wild oats was probably introduced with the original seed wheat (Farm & Garden (1858) 1: 38). Specimens collected by Blandowsky and Mueller in 1851 around Adelaide are at MEL!
143. In 1858, regarded as the pre-eminent weed of S.A., found in all cultivated land (*Ibid*).
144. *L. temulentum* is a very rare plant in South Australia at present, if not extinct. There are few herbarium specimens in the collection at MEL!, NSW!, AD! or ADW! The Mueller material at MEL!, originally determined as *L. temulentum* is actually a mixture of *L. multiflorum*, *L.perenne* and *L. rigidum*, i.e. members of the annual *Lolium* complex (*L. multiflorum* and *L. perenne* behaving as annuals). The past and present status of *L. temulentum* in Australia is obscure and is presently being investigated.
145. This suggests that *L. temulentum* is not the species being considered. *L. temulentum* is harvested with the crop and is in fact a grain contaminant.
146. This is the same wild oats, *Avena fatua*, as the black oat. Schomburgk's distinction is based on two situations in which one species was found.
147. Wild oats was a highly regarded fodder grass. The oaten hay being made to the west of Adelaide in 1850 (Yelland, 1970) could well have been *A. fatua*. In 1891 it was so well adapted as a fodder plant that it was considered that no other fodder species was necessary in the Maitland area. (Anon., 1891). The following year seed was sent from Stansbury and distributed in the Mundoora area (Anon., 1892). It is highly likely that seed had been distributed in a similar way in earlier years.
148. This species is unknown in S.A., although it was tried and rejected as a potential pasture grass (Francis, 1859a). The common annual *A. caryophyllea* L. could be intended but the earliest specimen located is one collected by Tepper in 1882 at Clarendon (MEL!). It is noted on that sheet as 'rare'.
149. Francis (1859a) called it sweet-scented vernal grass, which is its current common name.
150. *A. odoratum* L.
151. There are no early specimens of this species, but Francis (1859a) stated that it grew here "better than most of them (i.e. other English pasture grasses) and is most valuable . . . . . ."

Cocksfoot Panic[152] - *Panicum Crus-galli*, Linn.[153] A native of Europe[154].
Glaucous Setaria - *Setaria glauca*, Beauv. A native of South Europe[155].
Creeping Dogstooth Grass, or Couch Grass[156] - *Cynodon Dactylon*, Pers. A native of Europe and other parts of the world[157].
Annual Meadowgrass[158] - *Poa annua*, Linn. A native of Britain[159].
Ryegrass - *Lolium perenne*, Linn.[160] A native of Europe.
Rough Cocksfoot[161] - *Dactilis glomeratus*, Linn.[162] A native of Europe[163].
Floating Foxtail-Grass[164] - *Alopecurus geniculatus*, Linn. A native of Britain[165].
Wall barley[166] - *Hordeum murianum*, Linn.[167] A native of Europe.
Small and Greatspiked Quaking-Grass[168] - *Briza minor*, Linn.; and *Briza maxima.*, Linn. European species[169].
Barren Broom-Grass[170] - *Bromus sterilis*, Linn.[171] A native of Europe.
Downy Rye[172] - *Bromus commutatus*, R. & P.[173] A native of Europe.

---

152. Barnyard grass.
153. *Echinochloa crus-galli* (L.) Beauv.
154. Tate (1883) notes that this species had been collected by Mueller near Hahndorf and by himself at the Reedbeds but these specimens have not been located.
155. Both *S. glauca* and *S. viridis* Beauv. were recorded as natives of Central Australia by Tate (1880) based on the records given by Bentham (1878), but Tate also records *S. viridis* from the Adelaide area.
156. In Australia known as couch grass.
157. More likely to have originated in Africa but very widely distributed. Collected by Mueller around Adelaide in 1848 (MEL!) who noted it growing on roadsides. Francis (1859a) promoted it as pasture grass but it seems to have been more commonly associated with gardens as the "only suitable lawn grass for Adelaide" (Schomburgk, 1870), and being strongly recommended as a lawn grass (Heyne, 1871), who also noted it as growing wild in places around Adelaide. From 1880 it was noted at various times and places as a garden weed e.g. Garden & Field (1880) 6: 187.
158. Commonly known now as "winter grass".
159. Collected by Mueller around Adelaide in 1848 who noted it as frequent (MEL!). This species is never considered as a pasture grass but as a lawn and garden weed.
160. This probably refers to perennial ryegrass *L. perenne* in the wetter areas and to the annual ryegrass complex *Lolium* spp. in the greater part of the State (See note 144).
161. Now called "cocksfoot".
162. *Dactylis glomerata* L.
163. Introduced originally by Thomas Williams of the Hermitage, but the date is not stated (Farm & Garden (1859) 1: 270-272). It would have been before 1856 (Francis, 1859).
164. Currently known as "marsh foxtail".
165. Collected so widely and so early that Bentham (1878) suggested it may be truly indigenous. Black (1942) still followed that opinion. However Vickery (1953) concluded that it was an early introduction to Australia. It is still very widespread, particularly in the pastoral areas.
166. Invariably known as "barley grass".
167. *H. murinum* L. This species does not occur in S.A. but the name was used erroneously for both *H. leporinum* Link and *H. glaucum* Steud. Both species were collected widely very early (see Cocks *et al.*, 1976). It was early acknowledged as a weedy grass because of its awns (Francis, 1859a), although its virtues as a fodder (except at seeding) were also appreciated (W. Guilfoyle cited by Anon., 1881).
168. Known respectively as "lesser quaking grass" and "large quaking grass".
169. The former species was collected widely by Mueller and others in the Adelaide region c.1850 (MEL!); the latter species was sown as an ornamental (e.g. Heyne, 1877) but was collected by Mueller in 1848 at Echunga and in 1849 by the River Torrens (MEL!). They are both common in cooler and moist areas particularly the Mt Lofty Ranges.
170. Known as "great brome", but also known as "ripgut brome".
171. *B. diandrus* Roth, but other prominently awned species were lumped under this name last century especially *B. madritensis* L. No early specimens are extant; however by 1859 the awned bromes were sufficiently widespread to be well known as weedy grasses (Francis, 1859a).
172. Downy-rye brome grass (Loudon, 1855).
173. Not recorded for S.A. Possibly confused with plants of the following which are very variable.

Soft Broom-Grass[174] - *Bromus mollis*, Linn.[175] A native of Britain[176].

Hard Fescue-Grass - *Festuca duriuscula*, Linn.[177] *Festuca bromoidis*, Linn.[178] Both European grasses.

Small Canary-Grass - *Phalaris minor*, Retz.[179] *Phalaris canariensis*, Linn. Natives of South Europe[180].

Catstail Koeleria[181] - *Koeleria phleoides*, Pers.[182] A native of South Europe[183].

GARDEN PLANTS

The following plants cultivated in the gardens have found their way to the pasture lands surrounding towns and villages, and have become acclimatised viz:-

Oenothera suaveolens, Desb.[184]
Delphinium consolida, Linn.[185]
Linaria bipartita, Willd.[186]
Eschscholtzia californica, Cham.[187]
Scabiosa atropurpurea, Linn.[188]
Bellis perennis, Linn.[189]
Anchusa officinalis, Linn.[190]
Malva rotundifolia, Linn.
Malva parviflora, Linn.

---

174. Soft brome grass.

175. This species is uncommon in S.A. The species which is usually called *B. mollis* is probably *B. hordeaceus* L., but other closely related species couild also be present.

176. An early but undated specimen determined as *B. mollis* at MEL! is annotated "common on waste fields of St. Vincent's Gulf".

177. It is suggested that this is in error for *Catapodium rigidum* (L.) Hubbard (syn. *Festuca rigida* Kunth) which was collected very widely at an early date. Collected by Mueller around Adelaide and St Vincent's Gulf in 1848 (MEL!). The species cited by Schomburgk is not known from S.A.

178. *F. bromoides* syn. for *Vulpia bromoides* (L.) S.F. Gray, but both Mueller and Bentham (1878) included *V. myuros* (L.) Gmel. within the species. Both species were collected widely and frequently by Mueller and others c.1850 (MEL!).

179. Collected by Mueller about Adelaide in 1848 on roadsides and in fields (MEL!). Noted as "common" in 1859 (Farm & Garden (1859) 2: 27).

180. Bentham (1878) records that it is naturalized on the seashore at Bremerhaven, but the specimen could not be located. Many specimens identified as *P. canariensis* by Mueller have since been redetermined as *P. minor* (MEL!). *P. canariensis* is very rare in S.A. Schomburgk was possibly confused by the use of the common name 'canary grass' for *P. minor*.

181. Annual cat's tail.

182. Syn. *Lophochloa* spp.

183. A very common weedy grass collected by Mueller in the vicinity of Adelaide c. 1850. It spread rapidly and had already reached Fowler's Bay by 1880 (MEL!).

184. Probably *O. striata* Ledeb. ex Link, which was collected by Mueller around Adelaide c. 1850 but misidentified (Bentham, 1867) as *O. biennis* L. (MEL!).

185. Syn. for *Consolida regalis* S.F. Gray ssp. *regalis*. This species has never been recorded as having escaped in South Australia. At least one species of *Delphinium* (larkspur) was widely promoted as being toxic to locusts and grasshoppers e.g. Heyne (1882).

186. This refers to *Kickxia elatine* (L.) Dumort., and/or *K. sieberii* Dorfl. The latter is actually more common, although most early S.A. literature lumps them both under *Linaria elatine*. Its inclusion here by Schomburgk agrees with other records of the increasing frequency of the plant about this time.

187. This is a common garden plant (Californian poppy) but is a very rare escape and then only in the Mt Lofty Ranges.

188. Already collected by Mueller in 1851 (MEL!) and noted as being spontaneous in places near the Lofty Ranges. It was identified at that time as *S. maritima*.

189. Never recorded as a naturalized plant in S.A.

190. This species has never been recorded with certainty in S.A. Schomburgk was probably referring to *A. capensis* Thunb. which was a garden plant that subsequently escaped in the south-east of S.A. A specimen of *A. capensis* collected at St. Vincent's Gulf at an unknown date was determined by Mueller as *A. officinalis*.

Malva crispa, Linn.[191]
Verbascum thapsis, Linn.[192]
Verbascum blattaria,[193]
Sparaxis tricolor, Kerr.[194]
Ixias[195] - in fact most of the bulbs[196] introduced from the Cape of Good Hope[197] begin to spread in pasture lands near gardens.

---

191. There are only two *Malva* spp. naturalized in S.A., *M. parviflora* L. and *M. nicaeensis* All. (Barker, 1977). The first record of the latter is this State, data from 1906, but specimens of *M. parviflora* L. in MEL! date from 1847. Mueller notes that it occurred in waste places in Adelaide. Other species *M. verticillata* L. and *M. pusilla* Sm. for which *M. crispa* and *M. rotundifolia* are synonyms respectively, have been recognised in the past (see Black, 1948; Eichler, 1965) but Barker considers all our material previously determined as separate species to be included in *M. parviflora*.

192. *V. thapsus* L. This species was not collected in S.A. until this century but it had been introduced before 1856 as a garden plant (Francis, 1859) so it may have already escaped locally in Schomburgk's time.

193. Syn. for *V. virgatum* Stokes in With. This had been collected by Mueller at Brownhill Creek c. 1848 (MEL!). The specimen was seen by Bentham but was not recorded for S.A. (Bentham, 1868).

194. Noted by Bentham (1873) as a garden escape but no localities are given. The specimens were not located. They were already introduced by 1845 (Bailey, 1845).

195. *Ixia* spp. had also been introduced by 1845 (Bailey, 1845) but even in 1909, Black recorded them as only very locally naturalized.

196. Some other bulbous plants that had escaped by then include *Gladiolus undulatus* L. (*G. cuspidatus* in err.) *Tate*, 1879 (AD!); *Gynandriris setifolia* (L.f.) Foster, *Tate*, 1881 (MEL!); *Watsonia bulbillifera* Matth. & Bolus (syn. *W. angusta* Ker). These are recorded by Bentham (1873) but no localities are given, and there were possibly others.

197. Many were introduced very early, see Bailey (1845) and Francis (1859).

An Assessment of the Pamphlet's Place in South Australian Botany

Early Records of Introduced Flora

Casual references to introduced plants are found in the contemporary lay press, journals, letters and other documents of early settlers and travellers. However, these references are sparse and scattered. They must be used with care because of uncertainties of common names and errors of identification.

The Australian botanical literature of the nineteenth century is not well endowed with material concerning introduced plants. The novelty of the indigenous flora excited the attention of the early botanists and comments about the introduced flora were usually appended as afterthoughts to the main work e.g. Behr (1847), Mueller (1852) and Francis (1855). Hooker (1860) briefly discussed the naturalized plants of Australia and he appended a list of such species. However his list refers almost entirely to the Melbourne area. Woolls (1867) published a study entitled "Plants introduced accidentally" which discussed many alien species but he concentrated almost entirely on plants found in New South Wales and particularly around Sydney.

The 'Flora Australiensis' (1863-1878) rec ded considerable information about introduced plants but the South Australian data almost entirely derives from the period of 1847-1852 when Behr, Blandowsky and Mueller collected. Occasional collections of introduced plants by Waterhouse from the early 1860's were also recorded in the 'Flora Australiensis'. Until Schomburgk wrote his pamphlet there had been no study of alien plants in South Australia, apart from the almost thirty-year old information scattered through the 'Flora Australiensis'. Undoubtedly the subject was waiting to be treated and the leading botanist of the State at the time would appear to have been the appropriate person to attempt it.

Schomburgk's earlier writings on weeds

Schomburgk was appointed to his position as Director of the Botanic Gardens in 1865 following the death of the first Superintendent, G.W. Francis. In the Annual Reports of his first years he contented himself with detailing the business of the gardens and the associated activities such as the library, herbarium and zoological collection. Even so, he still commented on plants grown in the gardens which could be useful for fodder, perfumes, medicinal uses and other purposes. In his Annual Report for 1873 he commented on the general disappearance of the native flora in South Australia and in connection with this matter he included a paragraph which subsequently became the standard opening paragraph to his writings on weeds (Schomburgk, 1874, 1875, 1879, 1889). In it he expressed alarm at the disappearance of the indigenous flora as a result of a number of processes including the plough, axe and herds but also including the arrival of foreign plants which "became possessors of the ground, ejecting the indigenous herbaceous plants, and taking their place". He then went on to list seven weeds which were particularly serious. They were:-

"Dandelion *Cryptostemma calendulacea* R.Br. Cockspur *Centaurea melitensis* Lin. French catchfly *Silene gallica* Lin. Stinkaster *Anthemis cotula* Lin. Bathurst bur *Xanthium spinosum* Lin. Scotch thistles *Carduus Marianus* Lin. & *Onopordon acanthium* Lin."

(These are actually the following species:- Capeweed *Arctotheca calendula* (L.) Levyns. Maltese cockspur *Centaurea melitensis* L. French catchfly *Silene gallica* L. Stinkwort *Dittrichia graveolens* (L.) W. Greuter. Bathurst burr *Xanthium spinosum* L. Variegated thistle *Silybum marianum* (L.) Gaertn. Spear thistle *Cirsium vulgare* (Savi) Ten.

In 1875 he published a booklet 'The Flora of South Australia' which was written to be included in Harcus (1876). In his essay, Schomburgk included a section on 'The Naturalized Plants of South Australia'. This piece commenced with the same opening paragraph referred to earlier, then went on to list the same seven species (in a different order) and added "the so-called sheepweed, *Lithospermum davuriaum* Lehm; and *arvense* Lin." (the first name is a misspelt synonym for *Mertensia dahurica* G. Don, a native of Eastern Europe not known from South Australia. *L. arvense* is a synonym for *Buglossoides arvensis* (L.) Johnston, sheepweed).

Schomburgk then continued by wondering whether the infestations would be permanent or that by "an overstimulation" the intruders will degenerate and become extinct. This paragraph was also carried intact into his later writings.

He then listed a number of "the more troublesome weeds naturalized in South Australia, in addition to those already mentioned". This list is reproduced *verbatim* in Column 1 of Table 1; in Column 2 the correct name is shown where this is different from Schomburgk's and in Column 3 some clarifying comments are given when needed. It is noteworthy that up to this point, no grasses are included as weeds although *A. fatua* and *Lolium* spp. were known to be serious pests and indeed Schomburgk himself (1879) says so.

The 1875 treatment concludes with a short paragraph stating that a good many introduced grasses have improved the pasture near the coast, which presumably means the settled areas in general. This sentence was also used intact in later versions, but was attached to other material which has been published elsewhere.

Table 1. Schomburgk's "more troublesome weeds" (1875)

Schomburgk's name	Current name	Comments
Lepidium ruderale Lin.	native *Lepidium* spp.	See Note 21*
Capsella bursa-pastoris Lin.		See Note 17
Atriplex patula Lin.		Collected from Gawler River in 1848 by Meuller (MEL.) Omitted from Schomburgk (1879)
Urtica urens Lin.		See Note 139
Polygonum aviculare Lin.		See Note 132
Cnicus lanceolatus	*Cirsium vulgare* (Savi) Ten.	See Note 84
arvensis Hoffm.		See Note 84
palastris Willd.	*Onopordon acaulon* L.(?)	See Note 84
Cynara scolymus Lin.	*C. cardunculus* L.	See Note 78
Anagallis arvensis Lin.		See Note 110
Gnaphalium luteo-album Lin.		Introduced from England before 1859 but generally considered to be native. Its status is very difficult to determine (Drury, 1970). Omitted from Schomburgk (1879).
Portulaca oleracea		See Note 39
Foeniculum vulgare		See Note 61
Sonchus asper		See Note 107
Solanum nigrum		See Note 117
Cirsium lanceolatum Scop.	*Cirsium vulgare* (Savi) Ten.	Both species have already appeared in the list above as *Cnicus* spp.
arvense Scop.	?	See Note 84.

* Notes - refer to footnotes in the first part of this paper.

Other relevant writings by Schomburgk

Schomburgk read a paper to the Chamber of Manufacturers in Adelaide on 15 December 1873 entitled "The grasses and fodder plants which may be beneficial to the squatter and agriculturalist in South Australia". This was subsequently published (Schomburgk, 1874a) as a pamphlet and republished in its entirety in other publications. Even in this paper, Schomburgk again inserted his paragraph about weeds referred to earlier and included the original seven "particularly serious" weeds.

He also included as pasture grasses and fodders most of the grasses subsequently listed as improving the native pasture (Schomburgk, 1879). Furthermore he listed the three species of *Plantago*, *Melilotus alba*, *M. officinalis* and *M. lupulina* as such desirable plants. *Plantago* spp. was treated in the first part of this paper (See Notes 127 *et seq.*). *Melilotus alba* was an early pasture species (Francis, 1859) and *M. officinalis* almost certainly refers to *M. indica*. Early specimens (e.g. at MEL!) were originally determined as *M. officinalis* in error. *M. lupulina* (sic) refers to *Medicago lupulina* which was a fodder plant in Britain and elsewhere (Loudon, 1855) and introduced early to South Australia (Anon. 1858). However this reference here could well have been to *M. polymorpha*, which was widespread by that time, rather than to *M. lupulina* which apparently has been always somewhat localised in South Australia.

By 1876 it appears that the skeleton of the 1879 pamphlet was more or less ready. From the list of 28 weedy species already mentioned, four were omitted in 1879 (see Table 1) and only another 16 added to bring the number to 40. Of the naturalised desirable plants, two legumes had been noted - this was increased to eight, the eight grasses were

enlarged to 21 and the three other species (*Plantago* spp.) has already been covered. Hence, 35 more species of which 13 were grasses were added to those included in earlier writings.

Publication of the Pamphlet

There is no indication in records and documents examined, why Schomburgk published the pamphlet. He had already published a pamphlet on grasses and fodders (Schomburgk, 1874a) and a paper on the agricultural potential of various parts of the State (Schomburgk, 1875a). Both of these papers were reprints of addresses given on separate occasions before the Adelaide Chamber of Manufacturers during 1873. Both of these were held in high regard, perhaps because they dealt with possibilities rather than concrete matters. It would appear that Schomburgk's approach to his writing was highly theoretical and based little on field experience or observation. In fact in the paper in which he proposed a multitude of agricultural industries for various parts of the State, he stated *inter alia* that he had never been to Mount Gambier, the South and Encounter Bay although he had lived in South Australia for 21 years. (Schomburgk, 1875a). As at the time he was already 62 years of age it is most unlikely that he travelled widely afterwards.

His actual motives in publishing the article are not apparent. His Victorian counterpart, von Mueller, was publishing prolifically at this time, apart from being involved in the 'Flora Australiensis', and perhaps Schomburgk was emulating his illustrious colleague. It is pointed out that the material which became the basis of his paper, was originally prepared with a different intention, a most honourable one of promoting the conservation of native vegetation.

The period in which he prepared the paper is not certain but he was also preparing a paper on his South American studies (Schomburgk, 1879a) at the same time. Both pamphlets were published about the same date. Molineux (1879) reviewed them together as did the reviewers in the daily press.

In the return of the Government Printer for the year ending June 1880, 935 "folded and stitched" articles were printed for the Botanic Gardens. It is presumed that these articles are copies of Schomburgk's two pamphlets. The publication date was probably Thursday 16 October 1879. The reviews in the daily press were published on Monday 20 October 1879 and a copy of the pamphlet in the Adelaide Botanic Gardens Library has an inscription by Schomburgk which is dated 16 October 1879.

Reaction to the Pamphlet

The appearance of Schomburgk's pamphlet aroused passing interest in the lay, agricultural and scientific press. The Register reviewed the publication in its issue of Monday 20 October 1879. The reviewer, in completely uncritical acceptance, noted that it was all arranged and classed with Dr. Schomburgk's carefulness and accuracy. The contents were briefly summarised. This review was re-published in the 'Adelaide Observer' of 1 November 1879.

The 'South Australian Advertiser' received it with more honour, making the pamphlet the subject on an editorial in its issue of Monday 20 October 1879. The editoralist summarised the paper noting the rapidity of the spread of some weeds and ended by exhorting his readers that, had the first plants that appeared been exterminated then the weeds could not have spread. This review was reprinted as an item in the Farm & Garden section of the 'South Australian Chronicle and Weekly Mail' of 25 October 1879. It is noteworthy that whereas Schomburgk had artificially separated wild oats as a crop weed and a fodder plant, the editoralist did not do so but noted the difference was not in the plant but in the situation in which it grew.

However A. Molineux, the editor of 'The Garden and Field' when reviewing the pamphlet in the issue of November 1879 found faults on a number of points. The "Scotch thistle" and the "Cape marigold" (i.e. Capeweed) were introduced about 1841, much earlier than Schomburgk had given. The common iceplant (*Gasoul crystallinum* (L.) Rothm.) had been omitted. Molineux obviously considered the work incomplete for he concluded "Doubtless a second edition will be published in a short time, when the worthy Doctor's useful labours will be aided by colonists acqainted with other introduced "settlers" in our field. Every useful work must have a beginning, and we consider ourselves indebted to Dr. Schomburgk for the very good work he has commenced in this instance" (Molineux, 1879).

Professor Ralph Tate, the President of the Royal Society of South Australia, referred to the pamphlet at the meeting held on November 1, 1879. He "considered the list to be incomplete, as many aggressive weeds had been overlooked. Of these he mentioned particularly a species of *Diplotaxis*, a *Salvia*, *Chenopodium murale*, *Trifolium agrarium*, etc." On the other hand, "undue prominence was given to such species as *Bellis perennis*, *Eschscholtzia californica* etc." He thought that such a work could not be accomplished single-handedly and he trusted that the Society would assist by encouraging observers to furnish records (Tate, 1879).

It is quite clear that to competent and experienced readers there were serious errors and omissions in the work. It may be significant that in his Annual Report for 1879 (Schomburgk, 1880), Schomburgk did not mention the publication of the pamphlet though in previous years, other publications were recorded.

The pamphlet is not referred to again in the botanical or agricultural literature until it appears in an expanded version as Appendix C. of the Annual Report for 1888 (Schomburgk, 1889). The title was changed slightly to "The Naturalised Noxious Weeds and Other Plants in South Australia". The introductory material is identical to the previous edition except for a short paragraph placed at the very beginning. This paragraph is of interest for a number of reasons and is reprinted here.

"In 1879 I published a pamphlet on 'The naturalised noxious weeds and other plants which have been introduced into South Australia'. The list contained about eighty species. Since this period a good many more have found their way into the colony: some of them are very troublesome to agriculturalists and squatters, and some at the same time are useful, improving our pasturage lands. In my pamphlet I had omitted several plants which had already been introduced by the early colonists. I now republish the paper with the additions, the number having been increased from 82 to 126 species but there may still be some species overlooked."

The quoted title is incorrect - Schomburgk was probably writing from memory and it could be for this same reason that many of his botanical names and authority citations in all his writings are incorrect. He also showed a stubborness that in the 1889 publication the only species that he included, of those stated to be omitted by Molineux and Tate in 1879, was *Chenopodium murale* L.

Later Developments

Schomburgk's 1889 revision has already been mentioned. The Annual Report for 1888 to which this revision was attached as an Appendix was the last that Schomburgk prepared. He died in April 1891.

Schomburgk's pamphlet was entirely ignored. Tate who was a prolific author on botanical (and other) matters, apart from commenting upon it soon after publication (Tate, 1879) never refers to it again and even more surprisingly Black (1909) did not mention it either. Maiden (1920), quotes from it, in connection with capeweed but wrongly attributes the passage to the 1875 Annual Report.

More recently the paper was cited by Dr P.W. Michael who referred to it when detailing the history of *Oxalis pes-caprae* L. in Australia (Michael, 1964) and again in a more general way when summarising the history of weeds in Australia (Michael, 1972).

Retrospect

Two questions present themselves. Was Schomburgk's assessment of the weeds of South Australia at that time, reasonable? Why was the paper virtually ignored? The answers to both questions illuminate each other.

It is clear from the criticisms of Molineux and Tate that there were significant errors in and omissions from the work. The work is based heavily on 'Flora Australiensis' and therefore was unavoidably out of date, and no better example can be produced than of the treatment of the Leguminosae. Schomburgk's list does not include one species more or less, or by any other name than those recorded in the second volume of the 'Flora Australiensis' (Bentham, 1864). Similarly the Caryophyllaceae are the same as those listed by Bentham (1863). In families with numerous species, Cruciferae, Compositae and Gramineae, Schomburgk appears to have confused species e.g. *Barbarea vulgaris* for *Sisymbrium* sp., *Chrysanthemum segetum* for *Calendula* spp. and *Aira praecox* for *A. caryophyllea*.

One error carried through from earlier writings, was the inclusion of "Common Stinking Maruta - *Maruta Cotula* Dec. (*Anthemis cotula* Linn.)" This was included because, in earlier writings, Schomburgk (1874, 1874a, 1875) wrongly attributed the botanical name *Maruta cotula* to stinkwort (*Dittrichia graveolens*). *Anthemis cotula* was not recorded in S.A. until later.

Another error was the inclusion of the same species more than once under different names. The following species are involved:-

Cirsium vulgare	as *Onopordon acanthium*, *Cirsium lanceolatum*
Dittrichia graveolens	as *Inula suaveolens*, *Maruta cotula*
Avena fatua	as *A. fatua*, *A. sativa* var. *melanosperma*
Bromus hordeaceus	as *B. mollis*, *B. commutatus*
Malva parviflora	as *M. parviflora*, *M. rotundifolia*, *M. crispa*

With hindsight, of his 75 distinct species, four are considered native (*Lepidium* spp., in error for *L. hyssopifolium*, *Gypsophylla tubulosa* in error for *G. australis* and *Urtica dioica* for *U. incisa*). Of the remainder, 12 are considered insignificant or not even present today and from the specimens available and other evidence have been uncommon or never occurred in South Australia. These are:-

Capsella procumbens (syn. for *Hymenolobus procumbens*)
Vicia hirsuta
Cirsium palustre
Cirsium arvense
Chrysanthemum segetum
Anthemis cotula
Hyoscyamus niger
Plantago major
Alopecurus geniculatus
Delphinium consolida
Eschscholzia californica
Bellis perennis

It is clear from the reviews of Tate and Molineux that conspicuous species were omitted. Nearly thirty years earlier Mueller (1852) had estimated that almost 100 species had become naturalised in South Australia "beyond the possibility of extirpation". Thirty years after Schomburgk's pamphlet, Black (1909) included 368 plants as naturalised in South Australia and propagating themselves spontaneously.

Following the departure of Mueller for Melbourne in 1852, botanical activity virtually ceased in South Australia. Any collections that were made have since been dispersed or lost. There are almost no extant specimens from the period 1852-1875

collected from South Australia generally and the agricultural areas in particular. However from about 1877 onward the Tate and Tepper collections were started and from them, it is possible to piece together a more accurate picture of the naturalised flora at the time. Tepper (1879) included a list of naturalised plants in his study of the Ardrossan flora. His list consists of 35 species, although a number of introduced species were included as natives e.g. *Alyssum linifolium* Steph. ex Willd., *Nicotiana glauca* R.Grah. (as *N. suaveolens* Lehm.). Of his list, 27 were included by Schomburgk. The remaining eight were: *Senebiera didyma* (L.) Pers., *Cucumis myriocarpa* Naud., *Erigeron linifolius* Willd., *Gnaphalium luteo-album* L., *Hypochoeris glabra* L., *Picris hieracioides* L., *Orobanche cernua* Loefl. and *Chenopodium murale* L. Of these *O. cernua* is probably a misidentification of the native *O. australiana* F.Muell. ex Tate and the status of *G. luteo-album* is equivocal.

Tate (1883a) recorded *Lagurus ovatus* L., *Marrubium vulgare* L., *Celsia cretica* Murr., *Sagina apetala* Ard. and *Mesembryanthemum* spp. as being naturalised on Kangaroo Island at that time.

Other additions may be made by thorough examination of the Mueller collections at MEL and Tate collections at AD. A few examples that were yielded by this search were:-

Papaver hybridum L. - in cornfield Lower North Road, Adelaide, x,1879 Tate, AD 97618618!

Physalis peruviana L. - two specimens 1849 MEL!, also noted as growing freely and fruiting at Second Valley in 1850 (Yelland, 1970).

Atriplex patula L. - "fluvii Gawleri", Mueller 1848 (MEL!). Erroneously recorded by Bentham (1870) as Gawler Ranges.

On the other side, Schomburgk did give definite opinions as to the status of some plants upon which earlier writers, particularly Bentham had equivocated. For example, *Capsella procumbens*, *Portulaca oleracea*, *Cryptostemma calendulaceum* and *Solanum nigrum* hitherto considered to be definitely native species were listed as introduced. Should it be argued that Tate (1880, 1890) and other writers intended native species of *Spergularia* and *Portulaca* respectively when including these species in later censuses of native plants, there are ample herbarium specimens to support the inclusion of *S. rubra* as a well-established introduction. Similarly, Schomburgk's note that *Portulaca oleracea* is a troublesome weed in gardens is sufficient to indicate that he is referring to our introduced species rather than the indigenous plant that bears the same name but is hardly known from the settled areas, let alone from gardens.

From this discussion it is clear that Schomburgk's contemporaries and successors judged this paper and correctly found it wanting. It was incomplete, contained many errors of identification, errors of fact and raised a number of plants to undeserved attention whilst underemphasising other plants known to have been important at the time. From our vantage point a century later, it gives us perhaps, a deeper insight into Schomburgk than into his "naturalized weeds".

When Black (1909) published his work on introduced plants, his motive was to complement Tate's (1890) coverage of the native flora. Black's work is a genuine milestone in South Australian botany. Apart from the intrinsic merit of the book itself, which was based on sound observation in the field, it was the forerunner of his Flora of South Australia which was the first State flora to be produced that was not based on the 'Flora Australiensis'. Black's work is still relevant, and his data and figures are being carried forward to a third edition of the "Flora", seventy years and more after they first appeared.

References

Anon. (1852). Report from the Select Committee on the Scotch Thistle and Bathurst Burr. (Sydney: Government Printer.)

Anon. (1858). *Farm & Garden* 1: 76.

Anon. (1881). *Garden and Field* 7: 38.

Anon. (1888). *J. Bur. Agric. S.A.* 1: 5.

Anon. (1890). *J. Bur. Agric. S.A.* 2: 194.

Anon. (1891). *J. Bur. Agric. S.A.* 4: 9, 11.

Anon. (1892). *J. Bur. Agric. S.A.* 4: 223.

Anon. (1897). *J. Dept. Agric. S.A.* 1: 98.

Bailey, F.M. (1906). "Weeds and Suspected Poisonous Plants of Queensland". (Brisbane: Pole).

Bailey, J. (1841). Plants flowering in the Botanic Gardens, June 1841. *S.A. Magazine* 1: 11.

Bailey, J. (1845). Catalogue of Plants cultivated in and for sale at the Hackney Nursery, Adelaide, 1845. *The Adelaide Observer*, May 3 1845.

Barker, W.R. (1977). The species of *Malva* L. and *Lavatera* L. (Malvaceae) naturalised in South Australia. *J. Adelaide Bot. Gard.* 1: 107-114.

Behr, H. (1847). Sudaustralische pflanzen I. Ueber die Verhaltnisse der sudaustralischen Flor im Allgemeinen. *Linnea* 20: 545-558.

Bentham, G. (1863). "Flora Australiensis", vol. 1. (Ashford: Reeve).

Bentham, G. (1864). "Flora Australiensis", vol. 2. (Ashford: Reeve).

Bentham, G. (1867). "Flora Australiensis", vol. 3. (Ashford: Reeve).

Bentham, G. (1868). "Flora Australiensis", vol. 4. (London: Reeve).

Bentham, G. (1870). "Flora Australiensis", vol. 5. (Ashford: Reeve).

Bentham, G. (1873). "Flora Australiensis", vol. 6. (London: Reeve).

Bentham, G. (1878). "Flora Australiensis", vol. 7. (Ashford: Reeve).

Black, J.M. (1909). "The Naturalised Flora of South Australia" (Adelaide).

Black, J.M (1920). Additions to the Flora of South Australia. No. 17. *Trans. Royal Soc. S. Austral.* 44: 190-197.

Black, J.M. (1924). "Flora of South Australia", vol. 2. 1st Ed. (Adelaide: Government Printer).

Black, J.M. (1935). Additions to the Flora of South Australia. No. 33. *Trans. Royal Soc. S. Austral.* 59: 252-262.

Black, J.M. (1942). "Flora of South Australia", vol. 1. 2nd Ed. (Adelaide: Government Printer).

Black, J.M. (1948). "Flora of South Australia", vol. 2. 2nd Ed. (Adelaide: Government Printer).

Capper, H. (1838). "South Australia". (London: Tyas).

Cocks, P.S., Boyce, K.G. and Kloot, P.M. (1976). The *Hordeum murinum* complex in Australia. *Aust. J. Bot.* 24: 651-662.

Drury, D.G. (1970). A fresh approach to the classification of the genus *Gnaphalium* with particular reference to the species present in New Zealand. *N.Z. J. Bot.* 8: 222-248.

Eichler, H. (1965). "Supplement to J.M. Black's Flora of South Australia". (Adelaide: Government Printer).

Francis, G.W. (1855). Letter to W.J. Hooker published in B.J. Best, "The Life and Works of George William Francis", 1966 (Adelaide).

Francis, G.W. (1859). "Catalogue of the Plants under Cultivation in the Government Botanic Gardens, Adelaide, South Australia". (Adelaide: Government Printer).

Francis, G.W. (1859a). Pasture grasses. *Farm and Garden* 1: 27.

Haegi, L. (1976). Taxonomic account of *Datura* L. (Solanaceae) in Australia with a note on *Brugmansia* Pers. *Aust. J. Bot.* 24: 414-435.

Harcus, W. (1876). "South Australia: Its History, Resources and Productions". (Adelaide: Government Printer).

Heyne, E.B. (1871). "The Fruit, Flower and Vegetable Garden". (Adelaide: Andrews).

Heyne, E.B. (1877). "The Amateur Gardener for South Australia", 2nd Ed. (Adelaide: Wigg).

Heyne, E.B. (1882). List of Garden, Agricultural and Other Seeds. Supplement to *Garden and Field*, May 1882.

Hooker, J.D. (1860). On some of the naturalized plants of Australia in Introductory Essay of "Flora of Tasmania", vol. 1. (London: Reeve).

Loudon, J.W. (1855). "Loudon's Encyclopaedia of Plants - New Edition". (London: Longman).

Maiden, J.H. (1908). A century of botanic endeavour in South Australia. *Australas. Ass. Advancem. Sci.* 11: 158-199.

Maiden, J.H. (1920). "The Weeds of New South Wales". (Sydney: Government Printer).

Michael, P.W. (1964). The identity and origin on *Oxalis pes-caprae* L. naturalized in Australia. *Trans. Royal Soc. S. Austral*: 88: 167-174.

Michael, P.W. (1972). The weeds themselves - early history and identification in History of Weed Research in Australia Symposium. *Proc. Weed Soc. N.S.W.* 5: 3-18.

Molineux, A. (1879). Received. *Garden & Field* 5: 92.

Mueller, F. (1852). The Flora of South Australia. *Hooker's J. Bot.* 5: 65-72.

Robertson, E.L. (1957). "Flora of South Australia", vol. 4. 2nd Ed. (Adelaide: Government Printer).

Schomburgk, R. (1870). "Annual Report of the Director of the Adelaide Botanic Gardens for 1869". (Adelaide: Government Printer).

Schomburgk, R. (1874). "Annual Report of the Director of the Adelaide Botanic Gardens for 1873". (Adelaide: Government Printer).
Schomburgk, R. (1874a). "The grasses and fodder plants which may be beneficial to the squatter and agriculturalist in South Australia". (Adelaide: Advertiser Press).
Schomburgk, R. (1875). "The Flora of South Australia". (Adelaide: Government Printer).
Schomburgk, R. (1875a). "Capabilities of the Various Districts in the Colony in Chamber of Manufacturers Papers 1875". (Adelaide: Government Printer).
Schomburgk, R. (1879). "On the Naturalized Weeds and Other Plants in South Australia". (Adelaide: Government Printer).
Schomburgk, R. (1879a). "On the Urari: the deadly arrow poison of the Macusis, an Indian tribe in British Guiana". (Adelaide: Government Printer).
Schomburgk, R. (1880). "Annual Report of the Director of the Botanic Gardens for 1879". (Adelaide: Government Printer).
Schomburgk, R. (1889). The Naturalised Noxious Weeds and other Plants in South Australia. Appendix C to the "Annual Report of the Director of the Adelaide Botanic Gardens for 1888". (Adelaide: Government Printer).
Stevenson, G. (1839). Gardening in South Australia in "Royal South Australian Almanack and General Directory for 1840". pp. 21-56 (Adelaide: Thomas).
Tate, R. (1879). Proceedings of Meeting November 1 1879. *Trans. Royal Soc. S. Austral.* 3: xiii.
Tate, R. (1880). A census of the indigenous flowering plants and ferns of extra-tropical South Australia. *Trans. Royal Soc. S. Austral.* 3: 46-90.
Tate, R. (1883). Additions to the flora of South Australia. *Trans. Royal Soc. S. Austral.* 6: 110-115.
Tate, R. (1883a). The botany of Kangaroo Island. *Trans. Royal Soc. S. Austral.* 6: 116-171.
Tate, R. (1890). "A Handbook of the Flora of Extra-Tropical South Australia". (Adelaide: Education Department).
Tepper, O. (1879). On the characteristics and distribution of the native and naturalised plants about Ardrossan. *Trans. Royal Soc. S. Austral.* 3: 24-45.
Vickery, J.W. (1953). A census of the native gramineae of New South Wales. *Contrib. N.S.W. Nat. Herbar.* 2: 67-87.
Woolls, W. (1867). Plants Introduced Accidentally (1866) in "A Contribution to the Flora of Australia". (Sydney: White).
Yelland, E.M. (ed.) (1970). "Colonists, Copper and Corn in the Colony of South Australia 1850-51". (Melbourne: Hawthorn Press).

Index to Scientific Names

Synonyms, misapplied, misspelt or illegitimate names are in italics.