

The Victorian School of Forestry Herbarium

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1. Introduction

1.1 Importance of herbaria and herbarium collections

A herbarium is a collection of dried and pressed specimens arranged in some form of classification system. Specimens may include flowering plants, ferns, gymnosperms, fungi, algae, moss, liverworts and lichens, and even bacteria and viruses. Herbaria range from large, well-funded national and state institutes to research herbaria in universities to private collections developed from natural history interests. In Australia, there are 28 major herbaria governed by the Council of Heads of Australian Herbaria (CHAH) and collectively these herbaria contain over 6 million specimens (Cowley and West 1999, [1[#]]).

Herbaria are important resources for research, teaching and communication. Specimens provide the basis for taxonomic, biodiversity, ecological and evolutionary studies and can afford economical and scientific gains to the wider community. Herbaria can provide research material for agriculture, biosecurity, conservation biology, human health, forensic science, control of invasive species, natural resources and land management. Herbaria also provide an insight into natural heritage, patterns of human settlement and change in vegetation composition. Large state and national herbaria clearly have greater impact on these activities but smaller, regional herbaria can provide invaluable supporting information and often incorporate considerable local knowledge.

1.2 The Victorian School of Forestry Herbarium

The herbarium of the Victorian School of Forestry (hereafter referred to as the 'VSF Herbarium') is a small yet noteworthy record of plant specimens collected in Victoria and throughout Australia since the late 1800s. More importantly it provides a historical archive of staff and student academic learning and endeavour. It is essential to preserve such a locally significant treasure and the information provided here is the first step in achieving this. At the present time the VSF Herbarium is not formally recognised by the CHAH.

We will first describe the composition of the VSF Herbarium based on recent databasing of specimens collected prior to 1965. This will provide a basis for documenting the history of the VSF Herbarium in terms of important collectors and how various collections came to be assembled and lodged at Creswick. The section following will document what is known about the movement and maintenance of the VSF Herbarium, including major cataloguing and remounting efforts in the mid-1970s. We will conclude with a discussion of the potential use and future of the VSF Herbarium.

2. Composition of the VSF Herbarium

The VSF Herbarium is housed in a number of large purpose-built wooden cupboards located in a small office on the Creswick campus of the University of Melbourne. Plant specimens mounted on standard herbarium sheets have been grouped into families and organised in alphabetical order in these cupboards. Specimens have previously been documented using a card catalogue system consisting of handwritten cards (7.6 × 12.6 cm, white card, blue lines) arranged in a set of wooden drawers (58 cm high × 41 cm wide × 76 cm deep). Presumably this catalogue system dates from the early- to mid-1970s when many of the specimens were remounted as the handwriting on the catalogue cards matches that on labels from many of the herbarium sheets.

Estimates based on the card cataloguing system indicated that there are up to 10 000 plant specimens in the VSF Herbarium representing some 2500 to 3000 species. We have recently produced an electronic database of the extant VSF Herbarium and entered details of over 4500 plant specimens that were created prior to 1965. Specimens that have not been catalogued in this database – those collected from 1966 to present – are estimated to comprise about one third to half of the collection, giving a more realistic total of approximately 8500-9000 mounted specimens in the VSF Herbarium. Current remounting efforts (to May 2010) of five additional boxes of plant samples have increased the number of specimens in our electronic database to over 5400 specimens.

As an indication of the thoroughness of some aspects of the collection, there are approximately 690 specimens representing 217 species in the genus *Eucalyptus* and 150 specimens representing 80 species of *Acacia*. Specimens in the VSF Herbarium have been collected from all states and territories in Australia and include a

[#] [1] indicates relevant web resources

range of native plants, weeds and cultivated plants. As might be expected, the best representation of plant specimens is from Victoria.

The earliest recorded specimens in the VSF Herbarium were collected in England in August to September 1877 by an unknown collector (see Section 4.3). Species collected include *Calluna vulgaris* (L) Hill*, (Common heather), *Erica tetralix* L (Bog heather) and *Asperula odorata* L (Sweet woodruff). We have no information about this collector or how his or her collection came to be lodged in the VSF Herbarium. The earliest representatives of native Australian plants are *Lasiopetalum parviflorum* Rudge (Small-flower velvet bush) collected by JH Maiden in 1887 and *Bassia diacantha* – now called *Sclerolaena diacantha* (Nees) Benth. (Grey copperburr) – collected by FM Reader in November of the same year. Native plant specimens from the von Mueller educational exsiccatae are likely to be older but there are unfortunately no collection dates available. There are several samples of rare species including *Grevillea williamsonii* F.Muell (Williamson's grevillea) originally discovered in 1893 by HB Williamson.

There are well over 400 specimens in the VSF Herbarium that were collected during the last three decades of the 1800s. The majority of these were connected in some way to HB Williamson (see Section 3.2). During the first half of the 1900s until 1950, more than 4100 specimens were added to the VSF Herbarium with the busiest years being 1912 and 1913 just prior to the start of Australia's involvement in World War I (over 550 specimens for these two years) and during the immediate post-war period (over 500 specimens collected 1918-1920). A similar pattern can be associated with World War II with good collections prior to the war in 1934 and 1936 (500 specimens collected during this period) and afterwards in 1946 and 1947 (370 specimens). In comparison, from 1951-1965, only 150 specimens were added to the collection. Unfortunately, over 500 specimens in the electronic database have no information about the date they were collected.

Of particular importance are collections made by former staff of the VSF. These include the first three Principals of the School (Baker 1993): Thomas S Hart (13 specimens), Charles E Carter (2 specimens) and Edwin J Semmens (approximately 1500 specimens) and Lecturers; James H Willis (70 specimens) and Francis R Moulds (1 specimen). There are no specimens collected by Alfred Ewart, head of the first Board of Examiners for the School and eminent botanist (Falvey and Bardsley 1997, and see contribution by LR Gillbank in this volume), as any of his collections would have been housed in the University of Melbourne Herbarium where he Professor of Botany (Gillbank 2007) or the National Herbarium of Victoria where he was the Government Botanist for 15 years (Hall 1978). It is also possible that he was more of a herbarium manager and user than a collector.

Many specimens in the VSF Herbarium have also been collected by amateur and professional botanists or foresters including Herbert B Williamson (approximately 1400 specimens), St Eloy D'Alton (43 specimens), Richard W Bond (233 specimens) and his son, Hedley W Bond (53 specimens), Francis S Wright (37 specimens) and his daughter, Winifred B Wright (181 specimens) and colleague, Wilfrid D Chapman (283 specimens). Details of these collectors are given in the next section. Several collections of international floras are also represented in the VSF Herbarium. These include the Flora of California and Oregon collected by Lewis S Rose (approximately 370 specimens), specimens from the Herbarium of Natal (ex Herbario Natalensi) collected by J Medley Wood and others (68 specimens); specimens of trees from the Forest Research Institute in India (18 specimens) and a collection of English plants (69 specimens). Details of these collections and collectors are given in Section 4.

3. Important Australian collections in the VSF Herbarium

3.1 Educational exsiccatae

There are 27 plant specimens from a set of educational exsiccatae created by Ferdinand von Mueller in the VSF Herbarium (Fig. 1). This is equivalent to half of a fascicle or volume (see below) and based on information from the volumes held by the Ballarat Mechanics' Institute; we suspect it was Part 1 (Ballarat Mechanics' Institute, 2008). This fascicle is thought to have been donated to the VSF Herbarium by the Creswick Mechanics' Institute (R Hateley, pers. comm.), but this has not been confirmed. There are records that the Creswick Mechanics' Institute received copies of volumes 1 and 2 [2]. The location of the original leather cover and title and index pages are unknown. All of the exsiccate samples have been remounted (the original herbarium labels have been retained for most of the specimens) and while this has undoubtedly reduced the value of the collection it has preserved the plant specimen itself.

* Species named in the text includes species authority and common name

Baron Sir Ferdinand Jakob Heinrich von Mueller was born in Rostock, Germany in 1825 and died in Melbourne, Victoria in 1896. He studied chemistry and botany at Kiel University and received a PhD for a thesis on the flora of the Schleswig-Holstein area. In 1847 he arrived in Adelaide, South Australia with two of his sisters. He found work as a chemist and shortly afterwards obtained 20 acres of land not far from Adelaide. Ferdinand von Mueller was a world renowned botanist who was awarded many medals and was made a member or fellow of a number of Australian and international scientific societies. He was elected as president of the Australasian Association of the Advancement of Science in 1890 (Hall 1978, Home 2008). His name is commemorated in several genera including *Muelleria* and *Muellerina* and many species including *Atriplex muelleri* Benth. (Mueller's saltbush), *Olearia muelleri* (Sond.) Benth. (Mueller's daisy bush), *Callitriche muelleri* Sond. (Starwort) and *Kunzea muelleri* Benth. (Yellow kunzea).

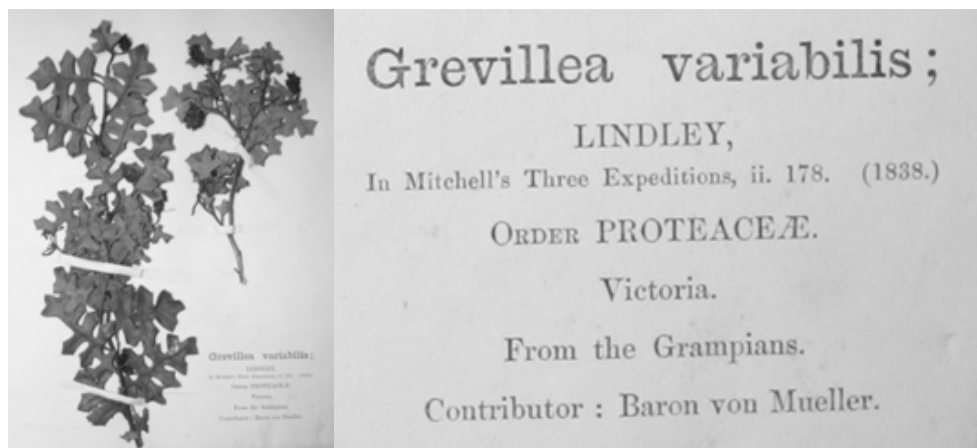


Fig. 1. A herbarium sheet from the educational exsiccatae produced by Ferdinand von Mueller. This example includes leaves and flowers of *Grevillea variabilis* Lindley collected by 'Baron von Mueller' 'from the Grampians'.

In 1853, von Mueller was appointed foundation Government Botanist of Victoria by Governor Charles La Trobe (Hall 1978, Home 2008). Ferdinand von Mueller explored and documented the flora of Victoria extensively, particularly the Alpine regions, Wilson's Promontory, Gippsland and the Goulburn River area. He was a prolific writer, publishing his research and corresponding with other botanists and plant collectors. He wrote several major botanical works including 12 volumes of *Fragmenta Phytographiae Australiae* (1858-1882), *The Iconography of Australian Species of Acacia and Cognate Species* (1887-1888), two volumes of the *Plants of Victoria* (1860-1865) and *Eucalyptographia; a Descriptive Atlas of the Eucalypts of Australia and the Adjoining Islands* (1879-1884). Arguably his most well known book was *Select Plants Readily Eligible for Industrial Culture or Naturalisation in Victoria* (1876) which went through nine editions and was at one stage retitled *Select Extra-Tropical Plants* (Hall 1978). He collaborated with George Bentham in the production of the later volumes of *Flora Australiensis* (1861-1878) and contributed papers on botanical subjects to German periodicals and the Linnean Society of London. He was instrumental in creating the National Herbarium of Victoria and was Director of the Royal Botanic Gardens, Melbourne from 1857 to 1873.

Through von Mueller's efforts, these educational sets of plant samples were sent to rural destinations 'throughout the colony' as part of his philosophical ideals regarding public education [Maroske 2007, 2]. This exercise was based on the principle that the best way to learn about plants is to impart basic information about the names and relationships among plants. An exsiccatae typically comprised multiple copies of a set of plants that had been collected from areas in which they were regarded as indigenous [Maroske 2007, 2]. Each volume or fascicle comprised 50 sheets with each sheet containing both a flowering and a fruiting specimen of a single species. Each sheet also had a label containing the scientific name of the species, the botanist who named it, the publication in which it was first described, the Order (or Family) in which it was found, notes on geographical distribution, the locality where the specimen was actually collected and the name of the individual who collected them. Each copy of the fascicle was introduced with a title page and concluded with an index and was bound in a leather cover. Educational exsiccatae were to be used alongside botanical works such as *Plants of Victoria* and *Flora Australiensis*.

The first set of fascicles was distributed in 1874 to 46 institutes throughout Victoria. Two more volumes of fascicles were prepared and distributed in 1875 and 1876. The second volume was sent to the same institutions as

the first and the third volume was only distributed to 33 institutions, some of which had not received previous volumes [2].

Many of the specimens included in the first fascicle were collected by von Mueller himself [2]. Other specimens were collected by staff of the Botanic Garden and a large network of collectors that von Mueller had established across Victoria. Without this additional help, it is doubtful that von Mueller could have finished even the first fascicle of the exsiccatae [2]. In the VSF Herbarium there are eight exsiccatae specimens collected by von Mueller, six collected by Carl Walter, five by Carl Groener, four by Georg Luehmann, two by Dr Curdie and one each collected by Daniel Sullivan and WH Bacchus.

Johann Georg Luehmann (1843-1904) was an assistant to von Mueller from 1868, and along with Carl Groener, remained with von Mueller after he lost the directorship of the Botanic Garden in 1873 [2]. In 1896, Luehmann was appointed Curator of the National Herbarium of Victoria and later became Victorian Government Botanist [3]. Luehmann contributed many specimens to the National Herbarium of Victoria and managed the establishment alongside von Mueller (Hall 1978). Luehmann was very much overshadowed by von Mueller while he was alive, but after his death he published a number of articles including species descriptions and a taxonomic key in the *Victorian Naturalist* and the *Proceedings of the Australasian Association of the Advancement of Science* (Maiden 1908, [4]). Several species names commemorate his botanical contribution including *Eugeni luehmannii* F.Muell (Rose alder), *Eucalyptus luehmanniana* F.Muell. (Yellow-topped mallee-ash), *Casuarina luehmannii* R.T.Baker (Bull sheoak) and *Pultenaea luehmanni* Maiden [4]. Carl Groener was an invaluable assistant to von Mueller at the National Herbarium of Victoria but little is known about his botanical contribution.

Of the non-botanical collectors, Daniel Sullivan (1836-1895) was the Headmaster at the State School in Moyston. He often consulted with von Mueller and by 1882 had over 1600 plant specimens in his private collection (Short 2003). Carl Walter (1831-1907) was a photographer and professional plant collector and accompanied von Mueller on several forays [2]. He published numerous botanical papers in the *Victorian Naturalist* [5] and described a variety of orchid (*Diuris punctata* var. *D'Altoni* Walter) (Maiden 1908). The shrub, *Prostanthera walteri* F.Muell. (Monkey mintbush) was named by von Mueller to commemorate Walter's botanical endeavour. There are 39 specimens collected by C Walter in the VSF Herbarium spanning from 1893-1903.

Daniel Curdie (1810-1884), known as Dr Curdie, was born in Scotland and travelled to Australia in 1839. Along with his nephew, he squatted with his stock for many years at 'Tandarook', close to the present site of the town of Camperdown. He sailed back to Scotland in 1851 and returned to Melbourne in 1854 with his new wife. He corresponded with botanists Robert Brown, Joseph Hooker and Ferdinand von Mueller, the latter often visiting him at his homestead (Maiden 1908, [6]). The aquatic herb, *Limosella curdieana* F.Muell. (Large mudwort) bears his name.

3.2 The HB Williamson collection

Herbert Bennett Williamson (1860-1931) was a school teacher and Headmaster at a number of State Schools in Victoria for 49 years. He was a keen botanist and natural historian [7] and was known to plant native shrubs and trees in the grounds of the schools he taught at [8]. There is no record of how part of his collection came to be in the VSF Herbarium, however it may have been donated by Williamson through his appointment as Honorary Keeper of the Herbarium in the Botany Department of the University of Melbourne from 1929-1931. HB Williamson also knew Alfred Ewart (see above) through his honorary appointment at the National Herbarium of Victoria (Gillbank 2007) so the collection may have come to the VSF herbarium via this association. Most of his extensive private herbarium was bequeathed to the National Herbarium of Victoria [8]. He was Secretary and Librarian of the Field Naturalists Club of Victoria from 1921-1931 and published a number of botanical papers in the *Victorian Naturalist* and the *Proceedings of the Royal Society of Victoria* [7]. Amongst these publications, he produced a nine volume guide to ferns in Victoria and a monograph of the genus *Pultenaea* (Orchard 1999, [8]).

Mounted by H. B. Williamson Hawkesdale, 1895-98

Specimens in the VSF Herbarium attributed to HB Williamson can be divided into three sub-collections. Plants samples in the first sub-collection are labelled 'Mounted by H. B. Williamson Hawkesdale, 1895-98' with a blue ink stamp (Fig. 2). There are approximately 250 of these specimens and they represent the oldest of his collection spanning from 1892-1904. Plant specimens were originally mounted on thin grey card and information about the plant name and family, collector, location and date was written in ink with a distinctive handwriting. Unfortunately, many of these specimens have been removed from their original backing and remounted. Those

that are still on their original mounting have generally been cut to fit onto modern herbarium sheets. Many specimens have also been damaged or attacked by insects or mould, most likely due to improper storage. Despite this, there are some good examples of specimens that are well over 100 years old (Fig. 2).

Most of this sub-collection was made by HB Williamson himself although specimens were collected by many others including a number of ladies – Miss Mabel Anderson, Miss Brymer, E May Burkhill, Miss Cameron, Miss Daisy Handley (see Fig. 2), Miss McDonald and Miss A Robinson. St Eloy D’Alton provided 12 specimens from the Shire of Lowan and Mr FM Reader contributed nine from the Shire of Dimboola. About 25 samples in this sub-collection do not have the collectors name recorded.

St Eloy D’Alton (1847-1930) was a Shire Engineer and Land Surveyor in Nhill and Dimboola. He was part of the D’Alton family that can still be found in the Halls Gap-Grampians region (Stanton 1988, McKay and Chappel 1999, [9]). As an amateur botanist and field naturalist, he collected from areas including the Little Desert and the Grampians. He published several articles including *Notes on the Plants Indigenous to the North-West Portion of the Colony of Victoria* (1898) and *Botany of the Little Desert* (1913, Willis 1949b). He is commemorated in the name *Trymalium D’Altonii* F.Muell – now named *Spyridium daltonii* (F.Muell.) J.Kellerm (Narrow-leaf trymalium) and *Pultenaea d’altonii* H.B.Will. [10]. The type specimen of this species was collected by D’Alton near Nhill in 1897. In total there are 43 specimens collected by D’Alton in the VSF Herbarium spanning from 1892 to 1916, including two specimens of *Trymalium d’altonii* which were collected by him in 1899.

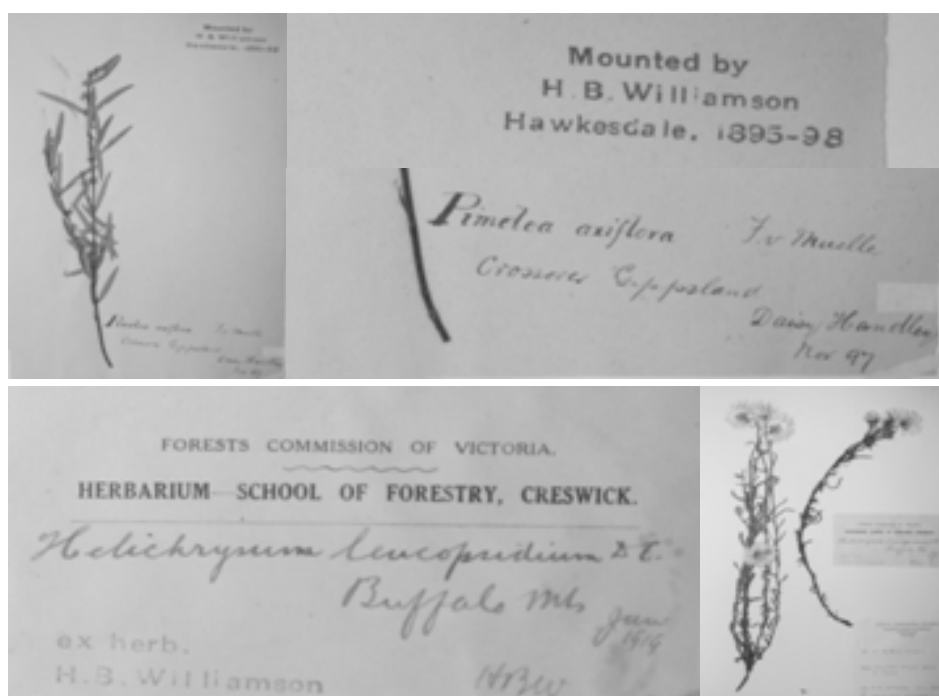


Fig. 2. Examples of specimens and detail of labels from the HB Williamson collection: (top) ‘Mounted by H. B. Williamson Hawkesdale, 1895-98’ sub-collection and (bottom) ‘ex herb H.B. Williamson’ sub-collection.

Felix Maximilian Reader (von Reyder) (1850-1911) was born in Berlin, Germany [11]. He had a chemist business in Dimboola and collected plants, mosses and lichens prolifically, particularly in the Wimmera region and south eastern South Australia (Willis 1949a, b [11]). Part of his collection (about 10 000 specimens) was purchased by the National Herbarium of Victoria for £80 [11] and was apparently second only to HB Williamson’s collection in terms of size and importance (Willis 1949b). Reader published in the *Victorian Naturalist* and was an expert in local grasses. Several species have been named after him including *Brachycome readeri* G.L.Davis (Southern daisy) and the moss *Pottia readeri* Brotherus.

ex herb HB Williamson

Specimens in the second sub-collection are annotated with ‘ex herb HB Williamson’ with a blue ink stamp (Fig. 2). There are approximately 1300 specimens with this label and date from as early as 1885 through to 1922. There are eight specimens collected after 1931 suggesting that sorting and division of HB Williamson’s

collection may have been made after his death and it came to be in the VSF Herbarium at some later stage, most likely when EJ Semmens was Principal of the School (see Section 3.3). Over 900 specimens were collected by HB Williamson himself. A number of other collectors contributed specimens to this sub-collection (see descriptions below) – SF Clinton, EW Curtis, St Eloy D’Alton, CH Grove, TS Hart, C Hawkins, JH Maiden, E Pescott, TA Robinson, J Rowe, EJ Semmens, AWR Vroland, C Walter, G Weindorfer and even Ferdinand von Mueller. Again, many ladies contributed plant specimens including Miss Brymer, Miss Datcock, Mrs Hamilton, Miss Hepburn, Miss McLennan, Miss Sheehan, Miss Thacker and Miss Thomas. Miss McLennan may well be Ethel McLennan, a student and colleague of Alfred Ewart (L Gillbank, pers. comm.). Overall, the quality of these specimens is better than in the older collection but there are still signs of damage to many of the specimens. Twenty five specimens do not have the collectors name recorded and 139 specimens do not have a record of the date they were collected.

Mr SF Clinton was a teacher at Mitta Mitta State School sometime prior to 1923. Clinton accompanied HB Williamson and Mr H Downes on a collecting trip to the Bogong High Plains in December 1922 to January 1923 and was described as being “an expert bushman, an enthusiastic mountain climber and a botanical collector” (Williamson 1923). It is recorded in the *Victorian Naturalist* that Clinton sent several samples collected from his local area to HB Williamson and JH Maiden for identification (e.g. 1919, vol 35; 1923, vol 40). There are 28 specimens collected by SF Clinton in the HB Williamson collection, most of which were collected from Mitta Mitta from 1917-1919.

Thomas Stephen Hart (1871-1960) was the first Principal of the VSF (1913-1925) and Science Master at the Ballarat School of Mines and Bairnsdale School of Mines and Industries (Willis 1949b, Willis 1960). He published articles in the *Proceedings of the Royal Society of Victoria* between 1899 and 1913 (Willis 1960, Farrall 1983, [12]) and in the *Victorian Naturalist* between 1892 and 1954. The most notable of these were about eucalypts in Creswick (Hart 1917) and the flora near Bairnsdale (Hart 1923). He collected throughout central Victoria and counted von Mueller as a friend and colleague (Willis 1960). The orchid, *Prasophyllum hartii* R.S.Rogers (Maroon leek orchid) commemorates his name as he collected the type specimen in Bairnsdale in 1925 [13]. There are 13 specimens attributed to TS Hart in the HB Williamson collection, mainly collected from the Bairnsdale area from 1918 to 1928.

Joseph Henry Maiden (1859-1925) was a botanist well known for his interest in economic botany. His early publications included *The Useful Native Plants of Australia* (1887, 1889), *Wattles and Wattle-Barks* (1890) and *The Flowering Plants and Ferns of New South Wales* (Part 1, 1895). He was a consulting botanist in the Forestry Division of the Department of Agriculture, Superintendent of Technical Education and eventually Director of the Botanic Gardens and Government Botanist (1896-1924) (Briggs 2001, [14]). He is accredited with creating the National Herbarium of New South Wales in 1901 [14, 15]. His major works included *A Critical Revision of the Genus Eucalyptus* (1903) and *Forest Flora of New South Wales* (1904). He was a remarkable botanist, teacher, public servant and historian and was awarded numerous medals for his achievements. His contributions to botany are recognised in the names of two genera, 35 species (e.g. *Eucalyptus maidenii* F.Muell. (Maiden’s gum)) and three infra-species (Hall 1978, Lyons and Pettigrew 1986). There are 17 specimens collected by JH Maiden among the HB Williamson collection.

Edward Edgar Pescott (1872-1954) was a teacher in the Victorian education system (Willis 1949a). He sent specimens from the Snowy River flats to the National Herbarium of Victoria while he taught at Orbost (Willis 1949b). There are nine specimens in the VSF Herbarium collection dating from 1900 and 1901 – four of these are from Orbost and one from the Snowy River. The orchid *Chiloglottis pescottiana* R.S.Rogers (Alpine bird orchid) commemorates his name [16].

Anton William Rutherford Vroland (1874-1957) gained teaching experience in Daylesford State School in 1892 and was awarded his teaching certificate at Trinity Grammar School in Maldon in 1893 (Spaull and Kerin 2002, [17]). He held lessons in the bush and wrote progressive teaching material that used examples drawn from the surrounding environment. He was a supporter of educational reform, equal pay for women, improved living conditions of Aboriginals and was a member of the Victorian State School Teachers Union (Spaull and Kerin 2002, [17]). Ten specimens in the VSF Herbarium were collected by AWR Vroland when he taught at Strathbogie North State School (1901-1906, [17]). These specimens include *Pultenaea vrolandii* Maiden (Bush pea) which was named to commemorate his botanical efforts. The type specimen of this species was collected by Vroland and forwarded onto JH Maiden by HB Williamson [18].

Gustav Weindorfer (1874-1932) arrived in Melbourne from Austria in 1900 and soon after joined the Victorian Field Naturalists Club [19]. Weindorfer promoted early tourism of Cradle Mountain in Tasmania and lobbied for

the recognition of the area as a National Park [19]. The species, *Pultenaea weindorferi* Reader (Bush pea) commemorates his name as the type specimen was collected by him in 1903 from Wandin, Victoria [20]. This species is represented in the HB Williamson collection and was collected by Weindorfer from the same area in 1904. There are 19 other samples collected by G Weindorfer dating from 1900 to 1903.

There is little information available for the other collectors identified in this sub-collection: EW Curtis (25 specimens collected from Gunbower Island in 1911 and 1913), Reverend CH Grove (25 specimens collected from Orbost and Snowy River from 1902-1906), C Hawkins (17 specimens collected from Murrayville from 1913-1918), TA Robinson (14 specimens collected Sale from 1897-1899) or J Rowe (12 specimens collected from Orbost from 1900-1911). HB Williamson described in the *Victorian Naturalist* a bicycle trip he made through East Gippsland in December 1911-January 1912 to see the area from which many dried and fresh samples had been sent to him by J Rowe, EE Pescott and CH Grove (Williamson 1911).

Collected by HB Williamson

The third sub-collection attributed to HB Williamson consists of the remaining specimens that have not been identified as above. This includes just over 300 specimens, all but eight of which were collected by HB Williamson. These cover the same range of dates as the 'ex herb HB Williamson' collection from 1893 to 1927. Specimens in all three sub-collections were collected mostly throughout Victoria but also in New South Wales and South Australia. The history of this sub-collection is not known.

3.3 The EJ Semmens collection

Edwin (Ted) James Semmens (1886-1980) was the Principal of the VSF from 1927-1951. Prior to this he was a primary school teacher (1902-1927) having graduated from the Melbourne Training College in 1910 (Moulds 2002). He studied part time and gained his Bachelor of Science from the University of Melbourne in 1925. After leaving the VSF, he became a local government councillor and president of the Shire of Creswick (1951-1975). Semmens has been described as a forester, teacher, field botanist, local historian and a community leader (Moulds 2002, [21]). Semmens joined the Field Naturalist Club of Victoria in 1916 while he was teaching at Ararat High School and HB Williamson was presenting his specimens to the group soon after (e.g. noted in *Victorian Naturalist*, 1920, vol 37). In 1935 he was elected a Fellow of the Linnean Society of London, in 1968 he was made a Member of the Order of the British Empire and in 1977 the University of Melbourne conferred him with an honorary Doctor of Forest Science (Moulds 2002, [21]). His extensive collection of historical documents and photos describing local community, agriculture and gold mining activities are housed in the Creswick Museum and the archives of the University of Melbourne, the latter occupying 58 m of shelving [22]. Information from the University archives revealed a note written by Ted Semmens in a document titled *1910-1960s Forestry School* describing the VSF Herbarium to "...contain some 10 000 specimens of Australian and exotic plants, including specimens of fungi..." (A Eddy, pers. comm.).

There are approximately 1500 specimens in the VSF Herbarium collected by Ted Semmens which is equivalent in size to the HB Williamson collection. About 170 specimens make up a sub-collection called Victorian Flora. This portion of the collection can be recognised by specimens mounted on a distinctive sheet (that may or may not have been cut down in size to fit modern herbarium sheets) or preservation of the label from the original herbarium sheet when the specimen was remounted (Fig. 3). It is not known how many samples may have been in this collection as the original label may not have always been kept during remounting. Up to 250 additional specimens may belong in this sub-collection but we lack the information to be certain. All of the specimens were collected between 1911 and 1913 and were from areas surrounding Creswick including Ballarat, Sedgwick, Lake Burrumbeet, Bunninyong, Haddon and Maldon. There is a wide variety of species (native species and introduced weeds) in this collection but mainly small shrubs, herbs, rushes and sedges. The specimens range from good to poor condition, the latter showing signs of wear and tear and inadequate storage.

The second sub-collection includes over 1300 specimens collected by Ted Semmens from 1910 to 1954, with 1936 being the most productive year. Many specimens have their original herbarium labels (Fig. 3) and some even have the original field label and collection number. Well over 1000 species are represented in this part of the collection as there is very little replication of specimens. Species were collected throughout Victoria and New South Wales from the bush and cultivated gardens. Again, samples range from good to poor condition and we suspect that many samples remained unmounted (and therefore prone to damage) until the remounting effort in the mid 1970s.

3.4 The JH Willis collection

James (Jim) Hamlyn Willis (1910-1995) was a student at the VSF from 1927 to 1930. After he graduated he worked as a Forest Officer in central Victoria and the Dandenong Ranges until 1937. He joined the National



Fig. 3. Examples of specimens and detail of labels from the EJ Semmens collection: (top) 'Victorian Flora' and (bottom) specimen with original herbarium label written by 'EJS'.

Herbarium of Victoria in 1937 as a taxonomic botanist and later became Assistant Government Botanist and served as the Acting Director until he retired in early 1972. He was one of the most well-known and respected botanists in Australia and wrote over 880 books, papers and reviews (Orchard 1999, [23]). He authored two volumes of *A Handbook to Plants in Victoria* (1962, 1972) which were used as the standard reference for over 30 years (Orchard 1999). He published a very popular article in the *Victorian Naturalist* titled *The Agaricaceae or Gilled Fungi* in 1934 and the Field Naturalists Club of Victoria readily published two small books titled *Victorian Fungi* in 1941 (second printing in 1950) with the second edition titled *Victorian Toadstools and Mushrooms* in 1957 (second printing in 1963). These books gave amateur collectors a good introduction to the

fungus world (May 1996, [24]). He was an active member of the Field Naturalists Club leading fungal forays, identifying plant and fungal specimens and serving on Council. He also published extensively in *Muelleria*, the journal of the National Herbarium of Victoria. He described 64 plant species and *Grevillea willisii* R.V.Sm. & McGill (Rock grevillea) commemorates his name. Jim Willis received many awards including the Royal Society of Victoria Research Medal and the Australian Natural History Medallion (1960) and he was made a Member of the Order of Australia in 1995 [23]. Jim Willis' notebooks, papers, photographs, slides and other memorabilia are housed in the archives of the University of Melbourne – nearly 4 200 items that take up 22 m of shelving and span from 1804 to 1995 [25]. There are 70 specimens collected by Jim Willis in the Herbarium mostly from 1931-1934 when he was a student and shortly after his graduation. These specimens include native and introduced species collected from Creswick and the VSF grounds but also from Frankston and the Dandenong Ranges. About 22 of his specimens still have the original field tags written in his distinctive and precise handwriting attached to stems (Fig. 4). Most of the specimens are in good condition and only one specimen has no information about where and when it was collected.

3.5 The Winifred B Wright collection

There is a substantial set of eucalypts gathered from across Australia in the VSF Herbarium which forms the Winifred B Wright collection (approximately 500 specimens). Plant samples were collected during the 1940s, mainly by FS and WB Wright and WD Chapman. Francis Sydney Wright, an accomplished engineer, was the father of Winifred (Winty) B Wright. Winty's interest in botany and her involvement in the collection was prompted by her father and his close friend, WD Chapman. As part of the curation process, Winty's father carefully sewed his plant samples onto thick card (Fig. 5). This was slow work and, in frustration, Winty took over this task when she was about 17 years old (W Calder, pers. comm.). When asked about the impressive collection, Mrs Calder remarked that she "could not take credit for the collection as I had those two men pushing me on". While the collection was being developed, mounted plant specimens were stored in envelopes and grouped together in plywood boxes that were affectionately called 'coffins' (W Calder, pers. comm.). Mrs Calder has no idea how the collection came to be included in the VSF Herbarium but perhaps it was through her connection with her husband, Stuart Calder (see below). Apparently, eucalypts only make up a portion of the specimens amassed by the Wrights and Chapman and the other part of their collection is lodged in the National Herbarium of Victoria.

Wilfred Dinsey (Chappy) Chapman (1891-1955) was born in London and came to Australia as a child. He had a long and distinguished career as an engineer and among other important appointments, was Director of Civil Engineering in the Department of Transport and Commissioner of the State Electricity Commission of Victoria (Hall 1978). Chapman served in World War I and II and attained the rank of Brigadier (Hall 1978). He was keenly interested in botany and the environment and was a member of the Royal Society of Victoria. Chapman was well known to Francis Wright, being his Officer-in-Command during World War II and close friend and

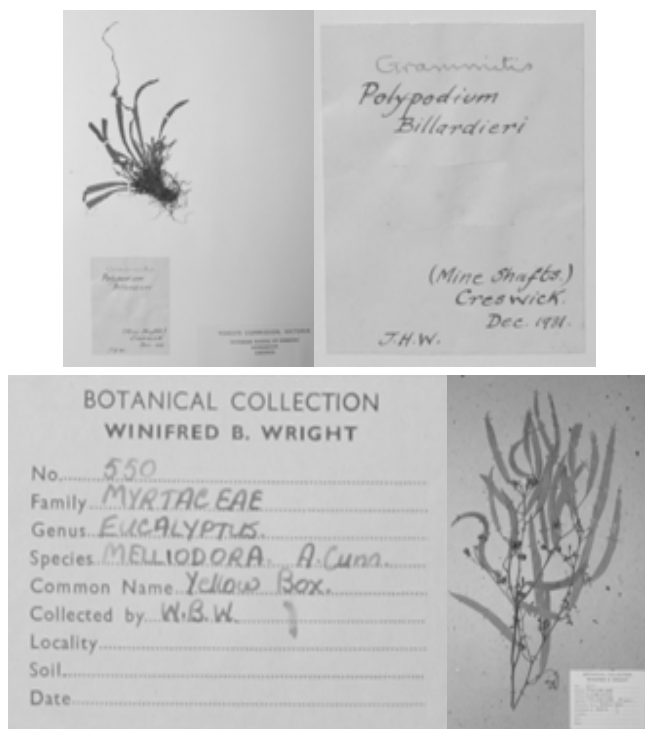


Fig. 4. Examples of specimens and details of labels from (top) the JH Willis collection with an original field label written by 'JHW' and (bottom) the Winifred B Wright collection with distinctive label and the specimen sewn onto thick card.

accomplice in plant collecting back in Australia (W and S Calder, pers. comm.). *Eucalyptus chapmaniana* A.K.Cameron (Bogong gum) is named for Chapman as he was the first to recognise this tree as a new species (Hall 1978).

Most of the samples in the Winifred B Wright collection are still mounted on the original card (and mounted intact on standard sized herbarium sheets) and have a distinctive label including the plant name, location and date of collection, the collector and a line for notes (Fig. 4). There are 37 samples attributed to FS Wright, 283 to WD Chapman and 181 to WB Wright. In addition, there are 10 specimens collected by other people. For example, H Furphy (Harry or Harold) was a fellow engineer and friend of Wright and Chapman (1 specimen), as was RA (Reginald Andrew) Young (1 specimen). Dr EI Littlejohn (1 specimen) was a medical doctor and a close family friend. Mrs Bolch was a neighbour and cleaning lady to the Wrights (3 specimens) and Miss B Acutt (2 specimens) was affiliated with Melbourne Girls Grammar (S and W Calder, pers. comm.). There are even examples of eucalypts collected by EJ Semmens and CE Carter (1 specimen each). Unfortunately, there are over 20 samples with no collector named. Collection dates span from 1938 to 1948 with 84 samples with no date recorded.

Winifred Wright wanted to study forestry but when she enquired about enrolment she was told that women were not permitted to attend the VSF. Instead she completed a degree in Botany at the University of Melbourne in 1953 and went on to gain a Masters degree in 1972 with a study of the vegetation of the Mornington Peninsular (W Calder, pers. comm.). This research formed the basis of the zoning and planning used today for the area. Winty married Stuart Calder, a graduate of the VSF (1952) and the University of Melbourne. She has authored several books (e.g. *Peninsular Perspectives* (1986) and *Mount Martha Lands and People* (2008)), historical articles in *Victorian Historical Magazine* and *Victorian Historical Journal* and many reports for government agencies and private organisations.

3.6 Other smaller but important collections

There are 233 specimens collected from 1930 to 1934 by RW Bond in the VSF Herbarium. Many of these are ferns and orchids and were gathered from Creswick, Gippsland, Wonthaggi, Inverloch, Gonyah and Wilson's Promontory. A large portion of the Bond collection is introduced and native species from the grounds of the VSF. Richard (Dick) Wallace Bond (1914-1976) was a student of the VSF graduating in 1934 (Moulds 1991). In the same year he co-authored with Charles Barrett a field guide titled *Victorian Ferns: Descriptions of all the Species Occurring in the State* published by the Field Naturalists Club of Victoria. After completing his studies, he was stationed in Neerim South with the Forests Commission and continued providing botanical input to the *Victorian Naturalist* (e.g. amended key to the Victorian orchids, Ewart 1936). During the war years, he supervised the salvage of Mountain ash after the 1939 fires. He worked for the Division of Forest Products in CSIRO and then as a soil conservationist with the Snowy Mountains Authority in the mid-1950s. Dick's time at Creswick overlapped with Jim Willis and the two often went on collecting trips together (H Bond, pers. comm.).

In the family tradition, Hedley W Bond also studied at the VSF, graduating in 1966 (Moulds 1991). He was appointed the Forest Botanist in his final year at Creswick and although he was unpaid, his responsibilities were to care for the herbarium, instruct junior students in tree identification and maintain signage in the grounds of VSF. He did a Masters degree in Forest Science at Yale University and a PhD in Ecology at the University of Utah (H Bond, pers. comm.). He now lives and works in the United States. There are 53 specimens collected by HW Bond during 1964 and 1965 from Creswick, Snowy River, Cooma, Upwey and the Dandenong Ranges. Specimens range from native ferns and orchids to introduced trees and native eucalypts.

Raymond V Smith was a student at the VSF, graduating in 1944 (Moulds 1991). There are 26 specimens in the VSF Herbarium collected by him between 1942 and 1944, mainly from the Creswick region but also from Gembrook and Williamstown. LB Williams was also a student at the School, graduating in 1947 (Moulds 1991). There are 25 specimens in the VSF Herbarium collected by Williams in 1947 and 1948 from East Gippsland and the Northern Territory. There are 26 specimens in the VSF Herbarium collected in 1954 by P and N Forde (13 specimens each) from around Melbourne and the Wail Arboretum. N Forde graduated from the VSF in 1953 and this may or not be the same person. Little more is known about these collectors. Even less is known about 'SB' who collected 53 specimens in 1955 and 1956 from the Grampians, Brisbane Ranges and Hattah and 'DMC' who collected 21 specimens in 1946 from Toolangi.

4. International collections in the VSF Herbarium

4.1 Flora of California and Oregon – the Lewis S Rose collection

There are over 250 specimens in the Flora of California and Oregon collections in the VSF Herbarium. These were collected by Lewis S Rose from 1931 to 1935 and, while restricted to the states of California and Oregon, represent counties as widely dispersed as Mendocino, Kings County, Tehama, Siskiyou and San Luis-Obispo. Representative genera include *Arctostaphylos* (19 species), *Astragalus* (9 species), *Carex* (11 species), *Gilia* (10 species), *Mimulus* (7 species) and *Trifolium* (11 species). Each sample has a distinctive printed label indicating the species name and collection number, the location and date of collection and brief notes of the type of area it was collected from (Fig. 5). It is likely that most of the plants were received as pressed and dried specimens that were unmounted but included a label. About 100 samples were mounted in the 1970s by VSF staff and students but the majority had been stored in boxes and are currently being mounted and databased. There is no record or recollection of how the collection came to Creswick however specimens of *Eucalyptus* examined from the herbarium of the Californian Academy of Science indicate that EJ Semmens corresponded with Rose and organised for exchange of plant material.

Lewis Samuel Rose (1893-1973) became interested in botany while he was a student at the University of California, Berkeley (McClintock 1974). After World War I, Rose was associated with the Department of Botany in the Californian Academy of Sciences for more than 40 years. He collected large sets of Californian plants and sent and received thousands of specimens from around the world including Australia, Europe, eastern Asia, South Africa and Argentina. Through his extraordinary exchange activities it has been estimated that he amassed over 100 000 specimens which he donated to the Academy. Ten species are named after Rose including *Senecio lewisrosei* J.T. Howell (Cut leaved ragwort) – now called *Senecio eurycephalus* var. *lewisrosei* (J.T. Howell) T. Barkley – and *Arctostaphylos rosei* Eastwood (Rosy Manzanita) – now called *Arctostaphylos tomentosa* (Pursh) Lindl. ssp. *rosei* (Eastw.) P.V. Wells (McClintock 1974).

4.2 ex Herbario Natalensi – the J Medley Wood collection

There are 68 specimens of African and South African plants collected by J Medley Wood and Mrs Dieterlen in the VSF Herbarium. Presumably they were donated or exchanged rather than lent (and never returned) to the

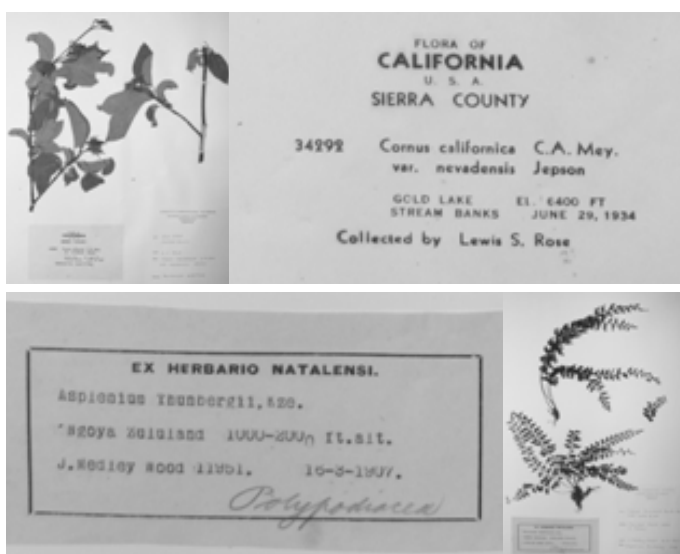


Fig. 5. Examples of specimens and details of labels from (top) the Flora of California collected by Lewis S Rose and (bottom) the ex Herbario Natalensi collected by J Medley Wood.

Herbarium as they are annotated as 'ex Herbario Natalensi' (Fig. 5). Specimens represent a number of orchid genera (i.e. *Brachycorythis*, *Bonatea*, *Disa*, *Eulophia*, *Habenaria*, *Listrostachys*, *Monadenia* and *Pterygodium*) but also include other families (i.e. *Erica*, *Senecio* and *Solanum*). The specimens were collected from 1904 to 1914 from a range of locations in South Africa. It is not known how they became part of the VSF Herbarium.

John Medley Wood (1827-1915) is widely regarded as the father of Natal botany. He was a self-trained botanist who collected widely and curated the Durban Botanic Gardens and Colonial Herbarium for 31 years from 1882 to 1913 [26]. He is also credited with the successful development of Uba sugar cane (*Saccharum sinense* L.) as a crop in Natal and experimented with other crop plants

on his farm [26]. He authored many books about the flora of Natal and is commemorated in the genera *Woodia* Schltr., *Woodiella* Sydow and a large number of species names including that of *Encephalartos woodii* Sander (Wood's cycad) [27].

4.3 The English plant collection

There are 68 samples that make up the English plant collection. Just over half of these (39 specimens) have been collected by B Smart from the area of Bath, England. Unfortunately, no information about when they were collected has been included on the handwritten labels that accompany the specimens (Fig. 6). The remaining 29 samples were collected from a range of locations in England (e.g. Alnwick, Humford Wood, Blyth, Callaby Woods) from 1877 to 1881. Specimens were mounted on small sheets of white paper and labelled with beautiful handwriting (Fig. 6). Some were even accompanied by poems or cuttings from magazines. We do not know who either of these collectors are or how their collections came to be in the VSF Herbarium.

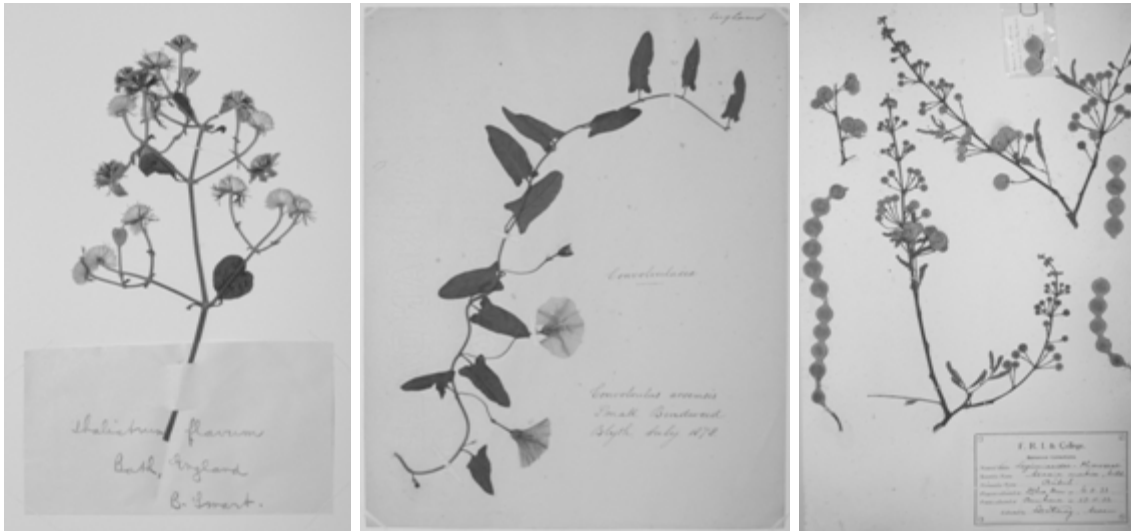


Fig. 6. Examples of specimens from the English plant collection (left) collected by B Smart and (middle) an unknown collector and (right) from the Indian tree collection from the Forest Research Institute and College in India.

4.4 The Indian tree collection – Forest Research Institute and College

Although there are only 18 samples in this collection they are all in very good condition and are very well presented (Fig. 6). Some specimens have been sewn onto the herbarium sheets. They were all collected between 1931 and 1933, mainly by S Dattaray but also by a number of other people. Collection locations in India range from Dehra Dun to Lachiwala. It is not known how these samples came to be in the VSF Herbarium but it is likely that they were part of a small exchange organised by Ted Semmens, possibly for teaching purposes.

5. Development of the VSF Herbarium

5.1 Movement and maintenance

The early history of the VSF Herbarium is rather vague. Ted Semmens would have amassed a large number of specimens including those in the HB Williamson collection and his own compilation. These and other specimens were consolidated in the late 1960s by Ron Hateley to coincide with the retirement of Ted Semmens as Head of the School. The 'newly' formed VSF Herbarium was located in Tremearne House in a small room close to the stairwell from 1976 until the mid- to late-1980s (R Hateley, pers. comm.). From here, the VSF Herbarium was moved a short distance to the Old Wood Technology Laboratory along with some of the pieces from the Forestry Museum. In 1997 or 1998, the VSF Herbarium was moved again, this time to a small room off the New Wood Technology Laboratory in the University Building where it is still found today. The second move coincided with the need for development of a common recreational area for the growing number of Vocational Education Diploma students (P Sheppard, pers. comm.). The reason for the first move is not known.

Many of the specimens in the VSF Herbarium were catalogued and mounted or remounted between 1969 and 1976. Funding for this exercise came from a drought relief initiative established by the Commonwealth Government (R Hateley, pers. comm.). Mounting and remounting of specimens was done by a number of people, including VSF students, but the majority were processed in 1975 by L Davies (1870 specimens) and L Barron (673 specimens). We are yet to find out who two these women are but they were thought to be from the local

Creswick community. Students that helped remount specimens (whether by choice or as part of their duties) included AG Bartlett (35 specimens), G Beach (52 specimens), P Devonshire (22 specimens), DJ Gallagher (22 specimens), B Kilgour (34 specimens), T McAleice (39 specimens), J MacPherson (49 specimens), P Farrell (51 specimens), R Safstrom (34 specimens), JL Sanders (95 specimens), RJ Steiner (22 specimens), K Tolhurst (22 specimens), JW Walls (74 specimens), BM Walsh (28 specimens) and B Ward (40 specimens). Unfortunately, no names were recorded for nearly 700 remounted specimens.

Penny Blackwell and Amanda Ashton have recently remounted and electronically databased an additional 840 samples that were found in five cardboard boxes stored in the room where the VSF Herbarium is currently located (June 2008-May 2010). This work is continuing and we estimate that there are 400-500 specimens remaining.

5.2 Recent additions to the VSF Herbarium

The databasing of herbarium specimens only includes those collected prior to and including 1965. This was due to limited, but essential funding from the History of University Unit and the Department of Forest and Ecosystem Science. Subsequent applications for funding and support have not yet been successful. More recent herbarium material includes student collections, demonstration and teaching material and collections from specific locations. Many of the newer specimens were gathered during annual field trips and were used to teach students how to recognise key genera and species and to prepare herbarium specimens (R Hateley, pers. comm.). This was an important part of the Forestry curriculum in the 1970s and such specimens now form a substantial part of the VSF Herbarium. As may be expected, many of the samples collected by past students are from the Creswick-Ballarat-Daylesford area and orchids and eucalypts feature prominently. Stories of students ironing their plant samples the night before their assignments were due are plentiful. Collection of plant material by students ceased during the mid 1980s as the teaching pedagogy for Forestry changed from practical 'hands-on' work to more theoretical studies (N Collett, pers. comm.) and permits for plant collecting became much more restricted under the Flora and Fauna Guarantee Act (1988) (R Hateley, pers. comm.).

6. Potential use and future of the VSF Herbarium

6.1 Vegetation change

Vegetation change occurs at a range of scales from the distribution of individuals and local communities to the composition and interactions of populations and whole ecosystems. Herbaria can provide retrospective benchmarks or baselines against which vegetation change can be assessed and can provide information on the nature of past patterns of vegetation (Miller-Rushing *et al.* 2006, Lavoie *et al.* 2007, Tobler *et al.* 2007). Herbaria have the advantage of providing tangible and quantifiable records of vegetation, which makes them a good source of data that allows a diverse range of uses (Bickford and Mackey 2004). Herbaria can be used to provide an assessment of effects occurring over long time scales or events that are unrepeatable such as human disturbance, altered fire regimes or single major fire events, long-term grazing, climate change and extended drought and other natural disasters (Stolle and Tomich 1999, Lunt 2002, Schulte and Maldenoff 2005, Lunt *et al.* 2006, Miller-Rushing *et al.* 2006, Franco and Morgan 2007). It is not possible to replicate these types of events either due to their long-term nature or effect over large spatial scales, lack of control over variables such as climate and the irreversible nature and huge extent of anthropogenic impacts on the environment. A good example is the use of historic records to enhance the assessment of the spread of weeds or invasive species in natural environments (Bickford and Mackey 2004, Schussman *et al.* 2006, Lavoie *et al.* 2007). Such studies have revealed that ecological modelling of plant distributions is less useful than actual distribution records (Schussman *et al.* 2006).

A recent student research project can be used to demonstrate the historical value of the VSF Herbarium. The hand-written card catalogue system was used to locate records of plant species found in the Creswick region within a 16 km radius of the town (i.e. the township of Creswick and smaller surrounding towns such as Newlyn, Allendale, Brown Hill, Invermay, Miners Rest and Ascot). Land-use in this region is comprised of agriculture (both cultivation and grazing), pine plantations and remnant native vegetation. This area corresponded to the region of a survey made by Jim Willis from 1928 to 1957 and recorded in a hand-written notebook titled *Synopsis of the Indigenous Plants Occurring Within a 10-mile Radius of Creswick, Victoria, Australia*. This resource provided a detailed description of over 450 plant species, including location, appearance, environmental variability and status. Information from Willis's records and from the VSF Herbarium was entered into an electronic database and compared with a professional vegetation database (Ecological Vegetation Classes (EVC)) for the same area provided by the Department of Sustainability and Environment. Data derived from the EVC system are considered to be the most up-to-date and accurate source of large-scale vegetation information

in Victoria, and as such provided an ideal source of information on the vegetation of the Creswick region for which to assess species change.

The EVC database had two to three times more species (1040 species) than either of the historical lists derived from Willis' document (404 species) or the VSF Herbarium card catalogue (260 species, P Blackwell, unpublished data). This is not surprising given the nature of the data collection method used for ECV. For all of the EVCs represented in the study area, complete lists of plant species are automatically included whether individual species actually occurs there or not (the notion of false positives). In comparison, species listed by Willis or derived from the VSF Herbarium were physically located in the area. This problem is commonly found when comparing recent and historic data as a result of increased understanding of the effects of sampling methods and improved technology. Modern studies tend to be more detailed than historical information (Lunt 2002, Bickford and Mackey 2004, Franco and Morgan 2007, Tobler *et al.* 2007). It has been suggested that while less precise in species identification and taxonomic information, flora surveying (i.e. the basis for compilation of EVC datasets) has an advantage compared to herbariums as they include a larger proportion of individuals and represent more systematic sampling (van Gernerden *et al.* 2005).

There was a considerably higher proportion of unique species (i.e. species found in one dataset only) in the EVC dataset (55%) compared with both of the historic data sources (13%). Again, this is not difficult to explain for the same reason as for species numbers. The EVC and VSF Herbarium datasets had about 30% of species in common with either of the other two datasets whereas the species list derived from Willis' survey had only 10% of species in common. This is perhaps more relevant for an examination of vegetation change, particularly when species lists are examined more closely. For example, it is apparent that there have been decreases in distribution of several species, including *Lepidium hyssopifolium* Desv. (Basalt pepper-cress) and *Levenhookia sonderi* (F.Muell.) F.Muell. (Slender stylewort) in the last 50 years according to comparison of Willis' synopsis and EVC records. Anecdotal evidence from Willis' notes suggests a number of species were already on the decline during his time. For example, the three ferns, *Pleurosorus rutifolius* (R.Br.) Fee. (Blanket fern), *Pellaea falcata* (R.Br.) Fee. (Sickle fern) and *Gleichenia microphylla* R.Br. (Scrambling coral fern) were described as "disappearing with agriculture", "may not occur now but it is probable the [species] grew widely before settlement" and "species once grew commonly on heathy soaks [but now] disturbed by extensive mining" respectively.

6.2 Future of the VSF Herbarium

Herbaria should not be considered to be cultural relics but can be used as important scientific research tools, contributing significantly to our understanding of ecological change and processes. For data from herbaria to be used more readily it needs to be readily accessible, accurate, useful and well-maintained. The quality of the VSF Herbarium specimens and the information they contain depends on ongoing cataloguing, maintenance and protection. If nothing else, the recognition of the importance of the collection needs to be documented and the resource preserved for future researchers.

7. Acknowledgements

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- [3] <http://www.asap.unimelb.edu.au/bsparcs/biogs/P001508b.htm>
- [4] <http://www.anbg.gov.au/biography/luehmann-johann-georg.html>
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- [6] <http://www.anbg.gov.au/biography/curdie-daniel.html>
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