2014 CONFERENCE PAPERS_ ALBANY

Australian Garden History Society

Contact

AUSTRALIAN GARDEN HISTORY SOCIETY INC.
Gate Lodge
100 Birdwood Ave
Melbourne
Australia 3004
T +61 3 8630 5347

AGHS Inc.
ABN 97 291 212 843

Content

1 ___ Tom Crossen

Geology and soils of South West Australia

INTRODUCTION
The planet upon which we live is 4.5 billion years old.
The Australian continent is one of great age, stability, aridity and flatness.
The rocks of S.W. Australia are 3.7 m.y.o.
Indigenous occupation of Australia dates back 140,000 years.

GEOLOGY
The oldest rocks are found in the Yilgarn Craton, a large piece of the earth's crust that underlies most of the south west was formed between 3.7 & 2.4 million years ago.

Between 2,000 & 1.8 million years ago the Yilgarn Craton collided with the Pilbara Craton to the north, forming a large new continent called the West Australian Craton. This slowly drifted NE until 450 million years later it collided with another large continent – the Mawson Craton.

Eventually the Mawson Craton was thrust over the West Australian Craton producing a huge thickness of crumpled crust (cf formation of Himalayas when India collided with Asia).

Igneous rocks such as granite were formed during this upheaval and the older granites were changed (metamorphosed) into gneiss. Slices of crust containing sedimentary rocks, such as the Barren Ranges were buried within this collision. The roots of this mountain range are known as the Albany Fraser Orogen and can be traced into Antarctic. These collisions resulted in the assembly of a super continent called Rodinia.

Some 750 m.y.a. Rodinia began to break up into smaller plates, these reassembled into a new super continent called Gondwana some 250 million years later which included Australia, Antarctica, India, New Zealand, South America, Africa and parts of S.E. Asia.

EVOLUTION OF THE SOUTH WEST LANDSCAPE
This landscape formed some 295 m.y.a. when a large icecap covered most of its surface. During this period Australia was close to the Southpole and glaciers carved broad deep valleys in the landscape.

Some 95 million years ago an extensive system of rivers was established over the area, eroding the underlying rocks and forming the drainage pattern which exists today.

The S.W. experienced a moist temperate to tropical climate some 65 m.y.a. resulting in dry inland penetration of rain bearing westerly winds; this period lasted for 30 million years (to the end of the Eocene period) with rain and surface runoff eroding the rocks.

A rise in the sea level, together with a lowering of the land surface, caused large areas of the hinterland along the south coast to be flooded by a warm sea rich in sponges. Only the highest points: the Stirling, Porongurup and Barren Ranges remained above sea level forming islands and peninsulas.

Between 40-25 m.y.a a tropical climate allowed deep rock weathering to occur. Alternating wet & dry periods leached out the more soluble minerals, leaving behind deeply weathered rocks overlain by mottled soils with an iron rich capping called duricrust.

1 ___ Tom Crossen

When the climate finally changed a period of "dry" occurred and the major river systems stopped flowing regularly. During the past two million years, the coastline changed positions many times in response to the expansion & contraction of polar ice caps. The Southern Ocean sculptured a natural bridge in the coastal granite and gneiss to form "The Gap" where huge waves rush in & out with tremendous ferocity.

When Australia and Antarctica parted some 120 million years ago, the sea slowly entered the rift between them and began to shape the southern coast. The rocks, granite and gneiss exposed by uplift, became weathered and eroded, relentless action by waves resulted in a series of bays being formed. Around 6,500 years ago the sea found its current level, flooding river valleys, which became Albany's harbours and the present coastline.

THE STIRLING RANGES

These were formed when the earth's crust buckled more than 1.1 m.y.a. This rugged range reaches up to 1100m above sea level separated by rivers, creeks and valleys, surrounded by aprons of gravel, sand and soil.

The Stirling Range comprises a variety of land forms e.g. valleys, 2lluvial plains and wetlands. These land forms have influenced the soil types that have formed and the amount of water available to some 1500 species of plants, including 82 species found nowhere else in the world.

The rock types comprise sandstones and slates collectively referred to as the Stirling Range formation. The original sediments were deposited some 1800 m.y.a. in a basin now largely removed by erosion. The Stirling Rage formation was originally laid down as sand, silt and clay in rivers, tidal flats and shallow marine environments. Evidence of water movement is preserved as ripple marks and mud cracks commonly found in flat slabs of sandstone near the summit of peaks such as Bluff Knoll.

THE PORONGURUP RANGE

Located 40km north of Albany, rising 670m above sea level, formed as a result of a collision between two major cratons between 1,300 & 1,100 million years ago, produced from vast amounts of molten magma deep in the earth's crust, then squeezed into surrounding rocks to form massive intrusions.

The range stretching 10km east to west is an island of granite, standing above the flat surrounding countryside resistant to erosion, such a land form is known as a MONADNOCK.
The lower slopes of the range are covered with duricrust, a remnant of a widespread surface that began to form across the south west during the Eocene.

THE SPONGOLITE CLIFFS

These rocks were deposited 40 m.y.a. when a warm sea invaded the land. They are heath covered escarpments and flat topped hills that rise up to 200 metres above sea level cut by rivers which form white cliffs, banded with brown or red beds.

The rocks known as the pallinup siltstone are made from the silica skeletons of sponges, the light weight porous rock is called spongolite and is used as a valuable building stone.

Geologically during the Eocene the sea level was some 300 metres higher than at present, with the coast up to 65km inland forming a huge basement extending from Albany to Israelite Bay.

1 ___ Tom Crossen

Sediments rich with skeletons of sponges slowly settled on to the sea bed, forming a blanket over the area as sea level fell, rivers draining the hinterland cut deeply into the soft spongolite, forming colourful gorges.

As well as sponges other forms of marine life such as bivalves, gastropods, plant leaves and nautiloids were preserved as fossils in the spongolite.

THE BARREN RANGES
These ranges form a distinct land form along the southern coastline. They were formed from layers of sand and silt originally deposited on the sea floor 1.7 m.y.a. Some 700 million years later these rocks were caught up in a massive craton collision, buried to 30 km, heated to more than 600°C and metamorphosed into today's rocks. They formed part of the same ancient mountain range that included the Porongurups a very distinctive land form and home to many plants found nowhere else in the world.

The ranges are composed of schist, which is a very fissile rock that can be broken into thin sheets, because it contains large amounts of mica. The schists formed when the shales and siltstones were metamorphasised to form mica. The ranges have been exposed by uplift and erosion by the action of pounding waves. During the Pleistocene (the last Ice Age) the sea level rapidly changed due to the contraction and expansion of the polar ice caps where the sea level was some 80m higher than it is today.

SOILS OF SOUTH WEST AUSTRALIA
The soils of southern WA in their formation are very much a component of the region's geology.

The Yilgarn craton (the Archean Shield) underlying S.W. Australia is one of the oldest and most stable land surfaces on the planet.

The soils of the region possess the following characteristics:
A high degree of weathering dating back 65 m.y.a. to a depth of 30-50m. The absence of volcanic, tectonic and glacial activity has resulted in minimal soil removal.
Widespread Laterisation deep weathering has resulted in the formation of laterite profiles, characteristics include

i) a high degree of leaching
ii) the accumulation of iron and aluminium near the surface
iii) many soils are formed on laterite.

Low fertility. Many major and minor elements of e.g. N,P,K,S,Cu,Zn,Mn,Mo & Se are deficient for plant growth, in addition soil organic matter is very low.
Coarse texture. Coarse textured soil materials (sands to sandy loams) dominate especially in the surface horizons. In general soils have a high sand and low silt component. This is a result of intense weathering of laterite and granite (dominant parent materials) leaving the highly resistant quartz.
Clay Content. Kaolinite is the dominant clay mineral formed as a result of intense weathering of laterite and granite. It is present in almost all soils comprising 80% of the clay content.

Soil Distribution
A system of provinces and zones exist to describe the pattern of soil distribution in the region.

Stirling Province a strip along the south coast some 120km wide located east of Albany extending to Israelite Bay on the Great Australian Bight. Formed over a basement of granite rock, which has been

1 ___ Tom Crossen

sporadically overlain by tertiary marine and continental deposits. The majority of the area is one of low relief and has been extensively laterised. Much of the province has been cleared for agriculture, but significant areas of mature vegetation remain.

South Coast Sand Plain a narrow strip of 80km wide along the south coast. This area is divided into 3 distinct zones of which the Albany sand plains is one where the dominant soils are grey deep sandy duplex soils and grey shallow duplex soils which are alkaline, sodic and water repellent.

Stirling Range Zone includes the Stirling Ranges, formed on basement (Proterozoic) meta sediments and gently undulating terrain formed over granitic rocks. Soils range from stony soils to shallow sandy duplex soils and hard setting grey clays.

CONCLUSION
The following processes influence soil formation worldwide:

1. Geology
2. Climate
3. Weathering processes
4. Relief
5. Time

It is estimated that the rates of soil formation are 0.02 – 0.11 mm/year.
Thus it takes 10,000 – 50,000 years to produce 1m of soil.

According to the United Nations Environmental Programme (NEP):

1. Some 26 billion metric tonnes of top soil are eroded every year. Over the past 20 years the world has lost around 500 billion metric tonnes.
2. Every year 6 million hectares of productive land are lost (at a cost of $42 billion) while another 21 million hectares are so impoverished as to become no longer suitable for farming or grazing.

ROCK TYPES
IGNEOUS – a rock formed from the solidification of molten magma.
SEDIMENTARY – a rock that has formed from:

1. the lithification of any type of sediment
2. precipitation from solution.
3. the consolidation of the remains of plants or animals.

METAMORPHIC – a rock produced by metamorphism i.e. a change of form from either igneous or sedimentary rocks.

GLOSSARY
Archean – the oldest period of the earth's history 3,600 m.y.a.
Craton – Portion of a continent that has been structurally stable for a prolonged period of time.
Duricrust.. is the case hardening surface of various rocks such as granite. It is a product of weathering influenced by climate.
Duplex – soils belong to a soil class called primary profile forms, which have a sharp change in texture and colour of the clay horizon e.g. red clay for brown, yellow for dark coloured clay.
Gondwana - The Southern part of the super continent Pangaea that broke up 200 million years ago to form South America, Africa, India, Australia, Antarctica.
Laterite – is a term derived from "later" which means brick. It is used to describe a deeply weathered soil profile with a surface iron horizon usually underlain successively by four zones, two of which are mottled and the basal parent rock.
Leaching – is the removal of nutrients from the A horizon down through the soil profile.

1 ___ Tom Crossen

Metamorphism – Is the transformation of pre existing rocks into a distinct new rock as a result of high temperatures and pressure without the rock melting in the process.
Monadnock – an uplifted rock like hill which has resisted erosion, remaining above the rest of the eroded land surface.
Orogeny – an episode of intense deformation of the rocks in a region, generally accompanied by metamorphism and plutonic activity.
Rodinia – a super continent formed some 750 million years ago.

2 ___ Phillip Palmer/Sarah Murphy

Old Farm, Strawberry Hill: Past, Present and Future

ABSTRACT
The National Trust of Australia (WA) manages over 60 heritage places including bushland and landscapes through to ruins, simple farmhouses and comparatively grand Victoria era residences. It would be fair to say there are no 'great gardens' in the portfolio. The majority are simple, utilitarian gardens with only vestiges of the earlier plantings and layouts remaining.

It is obvious that landscape settings are integral to understanding a place, be it a farm, ornamental garden or more utilitarian surroundings. Consequently a conscious effort is being made at our properties in Western Australia to better manage and conserve whatever historic plantings, features and layouts we have to enhance the understanding of the significance of these heritage places. We are basing our work on evidence, research and understanding as opposed to presenting decorative ornamental gardens in the so called 'National Trust tradition'. Old Farm, Strawberry Hill in Albany is a perfect case study.

Old Farm, Strawberry Hill is the site of Western Australia's first farm. It is one of the oldest surviving European cultivated landscapes in the State and contains fruit trees, a residence and cottage dating back to the 1820s. The place is important as a food gathering area and source of water to the local Aboriginal community who know it as *Barmup.* Old Farm was also the first property to be managed by the National Trust in WA.

For convenience the history of Old Farm, Strawberry Hill may be considered in terms of five overlapping periods, each of which has left its distinctive mark on the development of the place. These are described as the Mineng Period, the Government Farm Period (from 1827), the Spencer Family Period (from 1833 - 1889), the Bird Family Period (from 1889 – 1956) and the National Trust Period (since 1964).

The immense importance of Old Farm, Strawberry Hill in the history of human occupation, food production and modification of the landscape in Western Australia has been overshadowed in recent decades by its presentation to the

Fig 1: Location map of Albany in the Great Southern Region, This water colour of Old Farm, Strawberry Hill was discovered in a 19th century scrapbook that came up for auction in England in 2010. As the book belonged to the Trimmer family, the water colour is thought to have been painted by Sir Richard and Lady Ann Spencer's daughter, Mary Ann, who in 1836 married Arthur Trimmer. Mary Ann may have given the painting to her mother-in-law, Jane Trimmer, to take back to England after she visited them in 1845. Following much spirited bidding from both local and overseas vendors the National Trust of Australia (WA) was successful in its bid to purchase the scrapbook for £28,000 (AUS$48,000). Courtesy of National Trust of Australia (WA) Western Australia

2 ___Phillip Palmer/Sarah Murphy

Fig 2: This photograph of Old Farm, Strawberry Hill, which was in a small collection of loose photographs that came with the same scrapbook, has been dated through other versions of the same image at 1858. *Courtesy of National Trust of Australia (WA)*

Fig 3: Wendy and Joscelyn Bird in front of Old Farm, Strawberry Hill in 1937. The Bird family owned the property between 1889 and 1956. *Courtesy of National Trust of Australia (WA)*ion, Western Australia

3 _____Caroline Grant

Early Plant Introductions to Albany

Searching for a piece of Arcadia

I. INTRODUCTION

Albany was the first British settlement in the state of Western Australia. Under orders from Governor Darling, the settlement was established by Captain Edmund Lockyer, together with two officers, 18 soldiers, 23 convicts, and a surgeon, who sailed on the brig *Amity* from Sydney and arrived at King George Sound on 25th December 1826.

This paper will focus on the first successful garden at a place which the British called the 'Government Farm', and later 'Strawberry Hill'. It was known to the Mineng, the local Aboriginal people, as Barmup. It has been managed by the National Trust of Western Australia since the 1960s.

Albany is the principal town of the Great Southern region in Western Australia. Seventy kilometres to the north lies the Stirling Ranges, which rise to approximately 1000 metres. The temperature, rainfall and soils vary greatly within the region: Albany receives 930 millimetres of rain, experiencing mild temperatures all year round. Farming, timber, fishing, tourism and wine are the major contributors to the region's economy.[i] The City of Albany has a population of approximately 36,000. Figure 1 is a location map of the Great Southern region.

Fig 1: Location map of Albany in the Great Southern Region, Western Australia

II. ABORIGINAL OCCUPATION OF ALBANY

At the time of settlement Albany was occupied by the Mineng people, who belong to the group of Aborigines known as the Noongars. Their land covers the south west of Western Australia from a point north of Jurien Bay on the west coast to a point between Bremer Bay and Esperance on the south coast.[ii]

For the Aboriginal peoples, including the Noongar people, all nature was a garden. Food gathering, plant cultivation and other cultural activities related to six seasons, involving movement between the land and the coast. It is now recognised that the Noongars transported and cultivated plants such as

the cycad, *Macrozamia reidlii,* which added important nutrients to their diet. If not prepared correctly the cycad fruits can make people very ill.[iii]

The European concept of a garden involved enclosure, and the cultivation of flowers, fruit or vegetables.[iv] In the 1820s, owning a large orchard was an indication of wealth.[v] At King George Sound, the settlers' visions of Arcadia may well have included fruit trees and vines. Interestingly, in 2008 judges of the High Court in England decided that the Oxford definition of a garden was too narrow, stating that the key to what constituted a garden was the 'relationship between the owner and the land and the history and character of the land and space; and the Forestry Commission conceded that a garden could comprise woodland as well.[vi] The expanded definition has similarities to the Aboriginal concept of a garden.

III. EARLY PLANT INTRODUCTIONS IN THE 18TH-19TH CENTURIES

The first person to introduce European plants to the south coast of Western Australia was probably Captain George Vancouver, who visited King George Sound in October 1791, claiming it for Britain. He planted watercress, vines, almonds, oranges, lemons and pumpkins 'for the benefit of future visitors' on Green Island in Oyster Harbour.[vii] Green Island is the small dot in the image of Oyster Harbour, the inlet to the north of Emu Point in Figure 2.

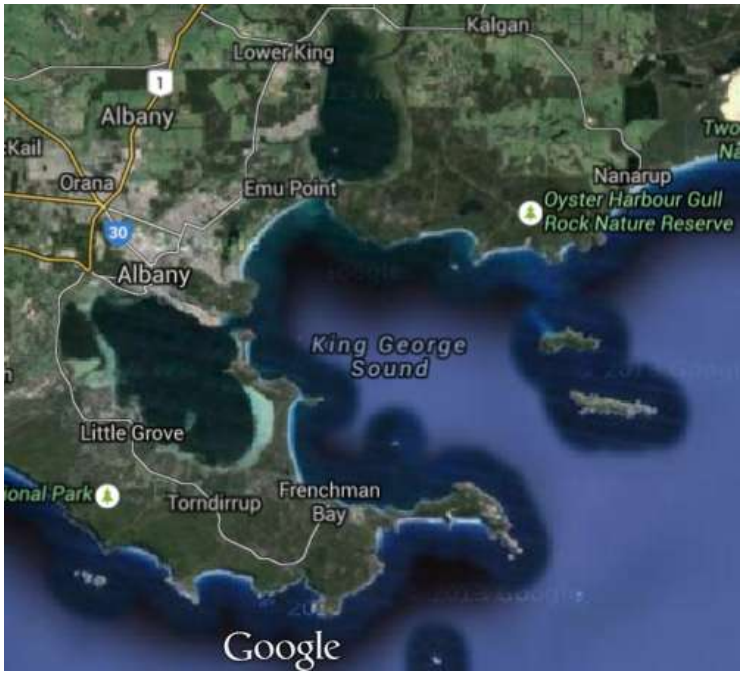


Fig 2: Location map of King George Sound, Western Australia. Courtesy of Google Maps

Vancouver expressed optimism by planting citrus, grape vines and olive trees. At this time such plants were cultivated in orangeries in England at great expense. At Heveningham Hall in Suffolk, close to Vancouver's home in King's Lynn, an elegant orangerie was commissioned in the same year that Vancouver visited the Sound. (See Figure 3).

Fig 3: The orangerie at Heveningham Hall built circa 1792 (photograph taken in 2012)

Vancouver and the botanist Menzies may have been encouraged by luxuriant growth in October after winter rain. Green Island is quite exposed, and the layer of soil is thin, though it may have appeared fertile due to guano (bird manure).

When the explorer Matthew Flinders visited King George Sound in December 1801 while charting the southern coastline of Australia, he lamented: 'There were no remains of these valuable gifts, [Vancouver's plantings] although nothing indicated the island to have been visited since this time; and, to our disappointment, the vegetation upon it now consisted of tufts of wiry grass and a few stunted shrubs, supported by a thin layer of sandy soil, which was every where perforated with rat holes.'[viii] It was known that sealers and whalers visited King George Sound in the years before settlement, and they may have unwittingly introduced rats from their boats.

The French explorer Nicolas Baudin, accompanied by a team of scientists, visited the Sound in February 1803. They were also disappointed when they searched for Vancouver's plants. Baudin recorded it likely 'that the great hordes of ants there destroyed it as it came up…'[ix] He also recorded planting some maize and other seeds near a stream flowing into the river now known as the Kalgan River.[x]

Phillip Parker King visited the Sound in January 1818. The botanist accompanying him, Alan Cunningham, sowed culinary seeds and peach stones near their tent, but when they visited Oyster Harbour in 1822, no signs remained of the garden.[xi]

These failed attempts at growing plants which require ongoing horticultural attention demonstrated that the Europeans' vision of Arcadia was perhaps overly idealistic.

IV. PUSH FACTORS

During the early 19th Century, the population in Britain exploded from 8.3 million people in 1801 to 16.8 million in 1851. Many people moved to the cities, which were becoming crowded. The Black Act of 1723 and many associated Acts made hanging for crimes against property commonplace, and the acts were not repealed until 1823.[xii] Transportation of convicts was a humane alternative to the

gallows.[xiii] The last of the Enclosures Acts left many people in the countryside landless, and the increasing mechanisation of agriculture gave little prospect of employment.

To compound the problems associated with the Napoleonic Wars, the catastrophic volcanic eruption of Mt Tambora in Indonesia caused crop failures, famines and civil unrest throughout Europe in 1816.[xiv] Unrest, arson and rioting continued throughout the 1820s, and 1830s, and the destruction of trees, gardens and orchards was a common crime, often directed at people of social standing.[xv]

In these circumstances, people in the countryside were only willing to grow fruit trees if they had security of tenure; otherwise they considered it not to be worth the expense.[xvi] In cities, air pollution and crowding allowed little opportunity for gardening, in an era when sugar was not yet readily available, fruit was a treat.

V. PULL FACTORS LEADING TO SETTLEMENT OF KING GEORGE SOUND

King George Sound was settled for a number of reasons, including a fear that the French or another nation would claim it.[xvii] The Sound also had strategic importance: it lay on a shipping route for the British sailing to New South Wales via the Indian Ocean. At King George Sound ships were assured of a sheltered harbour, fresh water and food, notably oysters.

A second reason was that the Foreign Secretary, Lord Bathurst, wanted to develop another convict colony, and in 1826 he wrote to Governor Darling in New South Wales instructing him to establish a settlement at King George Sound.[xviii]

The colonial authorities may have been optimistic about the land surrounding King George Sound having agricultural and pastoral potential, just as the land surrounding Sydney did. Officers like Lockyer and Spencer, whose services after the Napoleonic Wars were no longer required, were attracted to Australia by land grants. In 1835 Spencer wrote to a colleague: 'You appear astonished that I should emigrate, what could a poor man in England do better to provide for 10 children… I thought it better to make farmers of them all'.xix

VI. INTRODUCTION OF 'EUROPEAN' PLANTS AT SETTLEMENT

When the Amity arrived in King George Sound in 1826, space on board for people and supplies was at a premium. It was essential to establish a vegetable garden to add bulk to the diet, and provide vitamins, especially Vitamin C, to prevent scurvy. The settlers were understandably wary of eating local plants: during the early settlement period sheep died from eating poisonous gastrolobium plants.xx Fruit trees were not included in the first shipment, presumably because they were not the highest priority at first settlement.

The Colonial Botanist at the Botanic Garden in New South Wales, Charles Fraser, compiled the list of plants and seeds sent to King George Sound. Plants included the herbs thyme, American cress, water cress, parsley, peppermint, spearmint, tansy and marjoram. Two hundred pounds of Derwent potatoes, Syboul and Welsh onions were also sent.

Vegetable seeds included 'Double Alssomer pease', 'Blue Prussian Pease', Turkey beans, dwarf beans, and cabbage varieties 'Early Dwarf', 'Imperial', 'Battersea', 'Sugar Loaf', 'Red', 'Yellow Savoy' and 'Green'. Also included were cucumber seeds and New Zealand spinach (Tetragonia tetragonioides), a plant native to Australia and New Zealand also known as 'Warrigal greens' which had been used by Captain Cook to ward off scurvy. Bean seeds included 'Cream Thiddery', 'Dwarf', Scarlet running', 'Canterbury', 'Dun Spotted'. Other seeds included Prussian kale, 'Red Barcede', carrots, parsnips, green beet, 'Drumhead' lettuce, melons and French pumpkin. There was a great range of turnip and swede

seeds: 'Early Globe', 'Dutch', 'Yellow', 'Stone', 'Round' and 'Red'. Parsley, garden cress and mustard were also sent.

Many of the plants and seeds selected by Fraser had multiple uses. For example, both humans and cattle can eat turnips: at least six varieties of turnip seeds were sent. Cabbages can be eaten raw or cooked and contain Vitamin C, as do some of the herbs listed, which also have medicinal properties.

See Figure 4 below for an extract of the list:

Fig 4: Extract of the list of vegetables, seeds and herbs sent to King George Sound (courtesy of Sydney Royal Botanic Gardens Herbarium library)

Commandants Lockyer, Wakefield and Sleeman (December 1826- November 1829)

Lockyer, his officers and the convicts tried growing vegetables in a number of locations near the settlement, with limited success despite applying guano from Green Island and fish as manure. Lockyer's second-in-charge, Lieutenant Wakefield, tried to grow vegetables across Princess Royal Harbour at Little Grove.[xxi] They then tried Green Island, but the logistics of getting to and from either place were difficult. Wakefield then cleared some land behind Mt Clarence and planted '…an acre of maize and an acre of garden' at the place now known as the Old Farm at Strawberry Hill.[xxii]

Wakefield had successfully grown sufficient crops and established the settlement by the time Lieutenant George Sleeman arrived to take charge in December 1828. Sleeman recorded that he had grown three thousand cabbages and broccoli plants as well as turnips, potatoes, carrots, onions, radishes and parsley.[xxiii]

Captain Collet Barker (September 1828 - March 1831)
Lieutenant George Sleeman was succeeded by Captain Collet Barker who came from the struggling settlement at Raffles Bay. In his journal Barker recorded attempts to find new areas suitable for cultivation, surveying surrounding areas, including an expedition with Surgeon Braidwood Wilson. Like Wakefield, Barker conducted experiments to improve soil, creating compost, adding lime and potash, and breaking up clay deposits.[xxiv]

3 ___ Caroline Grant

Barker grew barley, oats, maize and wheat. He also grew a range of vegetable crops including turnips, cabbages, potatoes, pumpkins, peas and beans, and had success growing strawberries.[xxv] With these crops he was able to keep scurvy at bay, although one scurvy victim refused to eat vegetables because he said they did not agree with him!

A consignment of twelve peach trees was sent from Sydney Botanic Gardens in May 1827.[xxvi] An entry in Collet Barker's journal in November 1830 indicates that he had thinned '450 peaches from the peach tree, that the tree had been in production for two years and in its fourth year since the stone was set.[xxvii] Strawberries and peaches were considered luxury items.

Dr Alexander Collie (April 1831- March 1833)
After the Swan River Colony took control of King George Sound, command passed to the first Government Resident, Dr Alexander Collie, who arrived in April 1831. A Scottish surgeon raised on a farm in Aberdeenshire, and an avid plant collector, Collie grew potatoes, cabbage, cauliflowers, turnips, wheat and strawberries: by this time the farm was known as 'Strawberry Hill'. He wrote to his brother in Scotland that he was raising almond plants on which he would graft stone fruit such as peach, apricot and nectarine.[xxviii] Early in 1833 he reported a good harvest, and in March Collie moved to Perth.

Sir Richard Spencer (September 1833 – August 1839)
Spencer had served with distinction in the Napoleonic Wars. In 1815 he was posted to Malta with his family. When his naval career effectively ended in 1817, he retired to Lyme Regis in Dorset, where he had a large protected garden with many fruit plants.[xxix] He took with him a Malta orange tree that survived the journey to Lyme, and to Albany, and bore fruit until the 1920s, when the Bird family owned the Old Farm.[xxx]

In the 1820s the Dorset countryside surrounding Lyme Regis was in upheaval. Spencer made enquiries about a position in the Swan River Colony, and after some negotiations with the Admiralty, was appointed Government Resident in Albany.[xxxi] In 1833 Spencer, his family and servants sailed on the *Buffalo,* arriving in Albany in September.

In a letter to Robert Hay (first permanent under-secretary at the Colonial Office) Spencer listed the plants he would take to Albany:

> Malta orange trees, Olives, Peach, Nectarine, Currants, Gooseberries, Vines, Roses, Roots of Sage, Thyme and every sort of Garden Seed, Asparagus, Sea Cale, Haw Berries for Thorns for fencing the fields (probably common hawthorn – *Crataegus monogyna*) and some Acorns of which it is my intention to plant many acres for a future supply of useful timber when the thoughtlessness of the Colonists shall have made it scarce near the Port.[xxxii]

In November 1833 Spencer wrote to the Surveyor-General J.S. Roe, about importing certain plants for the first time:

> …first person to import the following fruit trees – oranges, lemons, citrons, olive, fig, mango, vines, gooseberries, currants, tea plant, nogara nut from Bengal (the most rapid growing tree known). Flowers – moss rose, cluster do., china do., trumpet honey suckle, tulips, narcissus, hyacinths etc. etc. the whole of which are growing in a luxuriant manner. Seeds; tea, cotton, citron, lemon, orange, shaddock thorns, holly and every description of superior English garden seeds; as well as 20 different sorts of English meadow grass seeds, most of which appeared soon after sowing but appear now to want water…

3 ___ Caroline Grant

In a letter to an acquaintance dated December 1835 Spencer wrote:

> … I have Malta oranges growing before my windows, grapes running up the posts of the balcony, and I have eaten Sea Kale, asparagus, currents, gooseberries, raspberries, strawberries, figs, almonds all of our own imposting…[xxxiii]

In October 1837 Spencer wrote to W.H. Mackie (Judge Mackie), who with his cousin Frederick Irwin owned a flourishing property with vines and fruit trees called 'Henley Park' in the Swan Valley:

> I would like early in the winter 12 or 20 grafted standard apple trees, that is grafted 4 ft from the ground for an orchard so that my cattle can graze under them… [xxxiv]

Of the plants in the garden at the Old Farm at Strawberry Hill, one of the oldest is a pear tree in the orchard, of unknown age and variety. (See Figure 5) Many old fruit trees, died out in the 1920s and the replacement trees included pears.[xxxv]

Fig 5: Old pear tree in the orchard at the Old Farm Strawberry Hill in Albany

VII. CHANGES IN FRUIT AVAILABILITY AND THE LANDSCAPE SINCE THE 1820s AND 1830s

In the 1820s fruit trees were bulky to transport. They take years to bear fruit, require soil rich in nutrients, plenty of water and sunshine, and special horticultural knowledge to cultivate successfully. Planting fruit trees is therefore a sign of commitment to a place.

In the 1820s the attrition rate when shipping fruit trees was high. However the technology for transplanting bare-rooted trees was improved by Sir Henry Steuart, and in the 1830s William Barron pioneered moving large trees with their root balls encased in a ball of earth with much greater survival rates than previously.xxxvi

The Wardian case improved on earlier attempts to transport plants across the oceans, developed by Nathaniel Ward with plants supplied by Loddiges Nursery in 1833. It was soon adapted for larger plants including trees.xxxvii By the end of the 1830s the possibility of transporting a wide range of plants had improved markedly since first settlement at King George Sound.

3 ___ Caroline Grant

Two generations ago people relied on growing their own fruit or buying it in season, hence the popularity of dried, canned and bottled fruit. Today, fresh fruit is relatively cheap and easy to obtain, due to improved communications, transport and plant breeding, and a longer shelf life.

In 1860 a passenger on board the P&O steamship *Malta* wrote:

> The soil around Albany is very poor, and there is little or no cultivation beyond a few gardens, which, so far as we saw, presented a neglected appearance. It was pleasant, though, to see short, shrubby apple-trees covered with rosy-cheeked fruit. We had a treat in our dessert of grapes, pears, apples, &c, on board the *Malta* for several days after leaving the sound.[xxxviii]

VIII. CONCLUSION

Western Australia's European fruit-growing heritage began at the Old Farm in Albany, with fruit plants and trees arriving from Europe and Sydney. Cultivation of fruit plants extended throughout the Great Southern region, with apples grown around Albany and Mount Barker exported until the 1970s, when the wine industry became more prominent in the region.

Western Australia has a different range of apple varieties to the eastern states, due to different climate and soils, distance from markets, and quarantine restrictions. There is an increasing worldwide demand for fruit, especially apples. The Great Southern region of Western Australia has great fruit-growing potential both now and when considering future climate change scenarios. Many residents of the Albany region retain an Arcadian vision which includes growing fruit.[xxxix]

3 ___ Caroline Grant

REFERENCES

Archer, John E. *By a Flash and a Scare: Arson, Animal Maiming, and Poaching in East Anglia 1815-1870*. London: Breviary Stuff Publications, 2010. Oxford University Press 1990.

Bird, Ivan. *The Story of Strawberry Hill: Middleton Road Albany Western Australia 1791-1891*. Albany: self. 1940.

Blackwell. June 2014.

Chessell, Gwen. *Alexander Collie: Colonial Surgeon, Naturalist and Explorer*. Perth: University of Western Australia Press, 2008.

———. *Richard Spencer: Napoleonic War Hero and Australian Pioneer*. Perth: University of Western Australia Press, 2005.

Elliott, Brent. *Victorian Gardens*. Portland, Oregon: Timber Press, 1986.

Fraser, Charles. "List of Seeds and Plants Forwarded from the Botanic Gardens at Sydney for the Settlement at King George Sound May 1827." NSW Govt State Records, 1827.

Gammell, Caroline. "The Legal Definition of a Garden." *The Daily Telegraph*, 4 July 2008.

Garden, Don. *Albany, a Panorama of the Sound from 1827*. Melbourne: Thomas Nelson (Australia) Limited, 1977.

Gardner, C.A., and H.W. Bennetts. *The Toxic Plants of Western Australia*. Perth: West Australian Newspapers Ltd, 1956.

Gardos, Amy. "The Historical Archaeology of the Old Farm on Strawberry Hill: A Rural Estate 1827-1889, Albany, Western Australia." University of Western Australia, 2004.

"Great Southern Development Commission: Economy." Government of Western Australia, http://www.gsdc.wa.gov.au/region/economy.

Malta, Passenger aboard the P&O company's steamship. "Visit to King George's Sound." *The Inquirer and Commercial News 1855-1901*, Wednesday 23 June 1869, 3.

Mulvaney, John, and Neville Green. *Commandant of Solitude: The Journals of Captain Collet Barker 1828-1831*. Melbourne: Melbourne University Press, 1992.

Oppenheimer, Clive. "Climate, Environmental and Human Consequences of the Largest Known Historic Eruption: Tambora Volcano (Indonesia) 1815." *Progress in Physical Geography* 22, no. 2 (2003): 230-59.

Phillips, Nan. "Vancouver, George (1757-1798)." National Centre of Biography, Australian National University, http://adb.anu.edu.au/.

Radzinowicz, L. "The Waltham Black Act: A Study of the Legislative Attitude Towards Crime in the Eighteenth Century." *The Cambridge Law Journal* 9 (1945): pp. 56-81.

Robertson, Geoffrey. *Dreaming Too Loud*. Sydney: Vintage, 2013.

Sellick, Douglas R.G. *First Impressions Albany: Travellers' Tales 1791-1901*. Perth: Western Australian Museum, 1997.

Short, Brian, Peter May, Gail Vines, and Anne-Marie Bur. *Apples and Orchards in Sussex*. Lewes Sussex: Action in Rural Sussex and Brighton Permaculture Trust, 2012.

Short, Philip. *In Pursuit of Plants: Experiences of Nineteenth and Early Twentieth Century Plant Collectors*. Perth: University of Western Australia Press, 2003.

The Shorter Oxford English Dictionary. 2 vols. Vol. 1, Oxford: Oxford University Press, 2002.

SWALSC. "Kaartdijin Noongar: Sharing Noongar Culture." South West Aboriginal Land & Sea Council, http://www.noongarculture.org.au/noongar/.

Watson, Frederick, and Peter Chapman. *Historical Records of Australia*. Vol. 6, Sydney: Library Committee of the Commonwealth Parliament, 1921.

West, D.A.P. *The Settlement on the Sound*. Perth: The Western Australian Museum, 1976.

Willes, Margaret. *Gardens of the British Working Class*. New Haven and London: Yale University Press, 2014.

"Great Southern Development Commission: Economy," Government of Western Australia, http://www.gsdc.wa.gov.au/region/economy.

[1] SWALSC, "Kaartdijin Noongar: Sharing Noongar Culture," South West Aboriginal Land & Sea Council, http://www.noongarculture.org.au/noongar/.

[1] Blackwell, June 2014.

[1] *The Shorter Oxford English Dictionary*, 2 vols., vol. 1 (Oxford: Oxford University Press, 2002).

[1] Brian Short et al., *Apples and Orchards in Sussex* (Lewes Sussex: Action in Rural Sussex and Brighton Permaculture Trust, 2012). p. 82

[1] Caroline Gammell, "The Legal Definition of a Garden," *The Daily Telegraph*, 4 July 2008.

3 ___ Caroline Grant

[1] Nan Phillips, "Vancouver, George (1757-1798)," National Centre of Biography, Australian National University, http://adb.anu.edu.au/.
[1] Douglas R.G. Sellick, *First Impressions Albany: Travellers' Tales 1791-1901* (Perth: Western Australian Museum, 1997). p. 14.
[1] Ibid. p. 27.
[1] Ibid. p. 29.
[1] Ibid. p. 39-43.
[1] L. Radzinowicz, "The Waltham Black Act: A Study of the Legislative Attitude Towards Crime in the Eighteenth Century," *The Cambridge Law Journal* 9 (1945).
[1]*Geoffrey Robertson, Dreaming Too Loud (Sydney: Vintage, 2013).* Robertson wrote that time and again, juries wrote that the value of goods stolen was 39 shillings. If you stole 40 shillings' worth, defendants went to the gallows.
[1] Clive Oppenheimer, "Climate, Environmental and Human Consequences of the Largest Known Historic Eruption: Tambora Volcano (Indonesia) 1815," *Progress in Physical Geography* 22, no. 2 (2003).
[1] John E. Archer, *By a Flash and a Scare: Arson, Animal Maiming, and Poaching in East Anglia 1815-1870* (London: Breviary Stuff Publications, 2010). See also B. Short, *Apples and Orchards in Sussex,* p. 83.
[1] Margaret Willes, *Gardens of the British Working Class* (New Haven and London: Yale University Press, 2014). p. 114.
[1] Don Garden, *Albany, a Panorama of the Sound from 1827* (Melbourne: Thomas Nelson (Australia) Limited, 1977). p. 13.
[1] Ibid. p. 14
[1] Amy Gardos, "The Historical Archaeology of the Old Farm on Strawberry Hill: A Rural Estate 1827-1889, Albany, Western Australia" (University of Western Australia, 2004). p. 217.
[1] C.A. Gardner and H.W. Bennetts, *The Toxic Plants of Western Australia* (Perth: West Australian Newspapers Ltd, 1956).
[1] D.A.P. West, *The Settlement on the Sound* (Perth: The Western Australian Museum, 1976). p. 77.
[1] Frederick Watson and Peter Chapman, *Historical Records of Australia*, vol. 6 (Sydney: Library Committee of the Commonwealth Parliament, 1921). pp. 506-512.
[1] Ibid. p. 531.
[1] John Mulvaney and Neville Green, *Commandant of Solitude: The Journals of Captain Collet Barker 1828-1831* (Melbourne: Melbourne University Press, 1992). p. 352-353.
[1] Ibid. p. 86.
[1] Charles Fraser, "List of Seeds and Plants Forwarded from the Botanic Gardens at Sydney for the Settlement at King George Sound May 1827," (NSW Govt State Records, 1827).
[1] Mulvaney and Green, *Commandant of Solitude: The Journals of Captain Collet Barker 1828-1831*. p. 353.
[1] Gwen Chessell, *Alexander Collie: Colonial Surgeon, Naturalist and Explorer* (Perth: University of Western Australia Press, 2008). p. 153.
[1] *Richard Spencer: Napoleonic War Hero and Australian Pioneer* (Perth: University of Western Australia Press, 2005). p. 60-64.
[1] Ivan Bird, *The Story of Strawberry Hill: Middleton Road Albany Western Australia 1791-1891* (Albany: self). p. 45.
[1] Chessell, *Richard Spencer: Napoleonic War Hero and Australian Pioneer*. p. 84-85.
[1] Ibid.
[1] Gardos, "The Historical Archaeology of the Old Farm on Strawberry Hill: A Rural Estate 1827-1889, Albany, Western Australia." p. 217.
[1] Ibid. p. 223.
[1] Bird, *The Story of Strawberry Hill*. p. 97
[1] Brent Elliott, *Victorian Gardens* (Portland, Oregon: Timber Press, 1986). p. 19.
[1] Philip Short, *In Pursuit of Plants: Experiences of Nineteenth and Early Twentieth Century Plant Collectors* (Perth: University of Western Australia Press, 2003). p. 332-333.
[1] Passenger aboard the P&O company's steamship *Malta*, "Visit to King George's Sound," *The Inquirer and Commercial News 1855-1901*, Wednesday 23 June 1869. p. 3.
[1] Bird, *The Story of Strawberry Hill*. p. 97.

4 _____Greg Keighery

Great Southern Plants, exemplified by the Dwellers in the Mist, the Blue Mountain Bells (Darwinia)

South Western Australia is an internationally known biodiversity hotspot for flowering plants with over 8,000 species only known from this area. Within this area are particular centres of diversity such as the Fitzgerald River National Park with over 1700 species and the Stirling Ranges with over 1500 species, 85 of which are endemic to the range. One, well known component, of these Stirling Range endemics is the Mountain Bells (*Darwinia* species in the family Myrtaceae, Figure 1).

Fig 01 A Mountain Bell.
Photo by Greg Keighery

The Mountain Bells are an appropriate symbol of the wildflowers of the Albany area and southern Western Australia in general. To Nineteenth Century European botanists and horticulturalists they were beautiful, exotic and desirable shrubs, despite only becoming known after 1850. However, by the early to mid-twentieth century they fell from favour. The Bells were seen by few people, rarely grown and poorly known both in the wild and cultivation, as well as being subject to many misconceptions. Now, unfortunately, many are now becoming both rare and threatened by human activities. This pattern is the same for a significant number of our wildflowers that, like the bells, are highly localised in their distribution and natural habitats.

Darwinia is a medium sized genus of 60 species of floriferous shrubs confined to temperate Australia, and named after Charles Darwin's grandfather Erasmus. *Darwinia* is related to the Geraldton Waxes (*Chamelaucium*, confined to WA), Albany Swamp Daisy (*Actinodium*, confined to WA), *Homoranthus* (eastern Australia), Feather Flowers (*Verticordia*, Australia wide) and the Coppercups (*Pileanthus*, confined to WA). Most members of this group produce colourful flowers or inflorescences creating very beautiful, horticultural desirable small shrubs. All members produce a small indehiscent fruit (nut) and most have a very unusual system of placing pollen in oil onto hairs below the stigma in the bud which is then presented to bee or bird pollinators as the style elongates as the flower opens (Figure 2).

4 ___ Greg Keighery

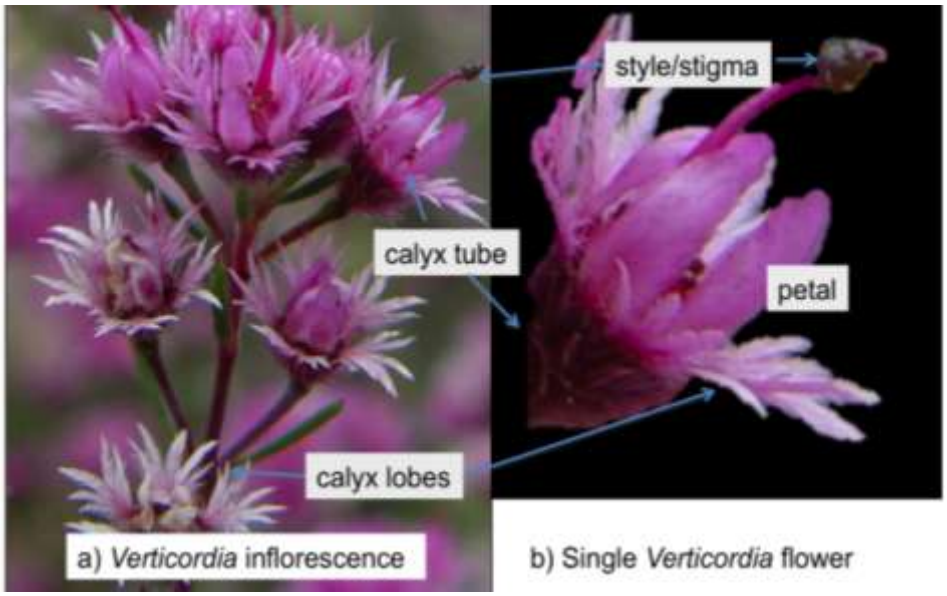


Fig 02 Basic structure of flowers in section Myrtaceae to which the Bells belong. Photos Bronwen Keighery

The genus, like many that are members of our flora, has its centre of diversity in south Western Australia where over 40 species are recorded. The Mountain Bells are a group of 10 species of *Darwinia* where the inflorescence is at the ends of branches in a compact head, nodding and surrounded by large colourful bracts which are the attractant for nectar feeding birds that are the pollinators (Figure 1). The plants are slender erect few branched shrubs that provide a perch for honeyeaters to probe into the head when seeking nectar. Nectar is secreted by the flowers onto hairs around the base of all the flowers, where it is held by surface tension and forms a substantial volume able to feed a bird. The nectar is protected by the bracts from dilution from the rain and mist that frequently occur in the range during the flowering season. The long styles of the flowers are curved inwards in several ways to ensure contact with the birds head to pick up and deposit pollen, thus the inflorescence acts like a single flower.

There are ten bell species. The Mountain Bells are related to a rare species of *Darwinia* (*Darwinia carnea*, the Mogumber Bell) which bears greenish yellow bells, and once occurred near Cranbrook, perhaps even in the foothills of the Range. However, it is now confined to two small populations at Narrogin (SE of Perth) and Mogumber (NE of Perth). All other 9 bell forming species are confined to the Range.

Mountain Bells are killed by fire and regenerate from soil stored seed, forming large uniform aged flowering populations 4 to 7 years after fire. These dense populations can create a stunning vista of blooms. They grow when soils are moist (winter to early summer) and flower in spring (August to November). Plants flower and seed profusely for the first 5 years after maturity slowly diminishing in number as the surrounding vegetation becomes denser, but never entirely vanishing. On the high eastern peaks where the vegetation is often lower they will remain for over 20 years and often re-seed in open patches. Each of the nine mountain bells occupies a distinct range of a few or a series of peaks, rather than the single peak as once thought (Figure 3). In general they occur above the 300 metres contour in either Mallee heath or Stirling Range thicket.

4 ___Greg Keighery

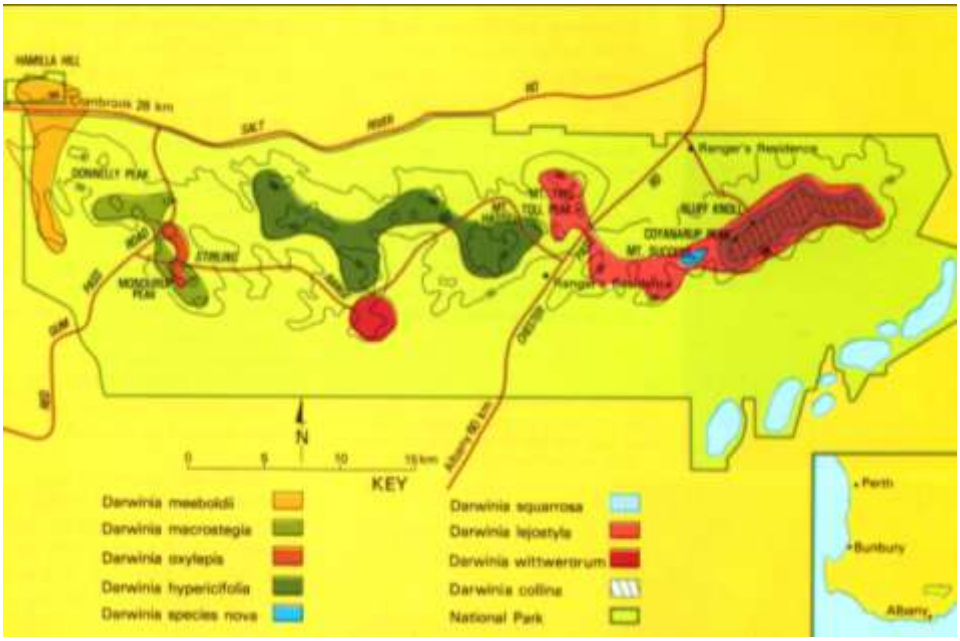


Fig 03: Distribution Mountain Bells. Drawings by Greg Keighery

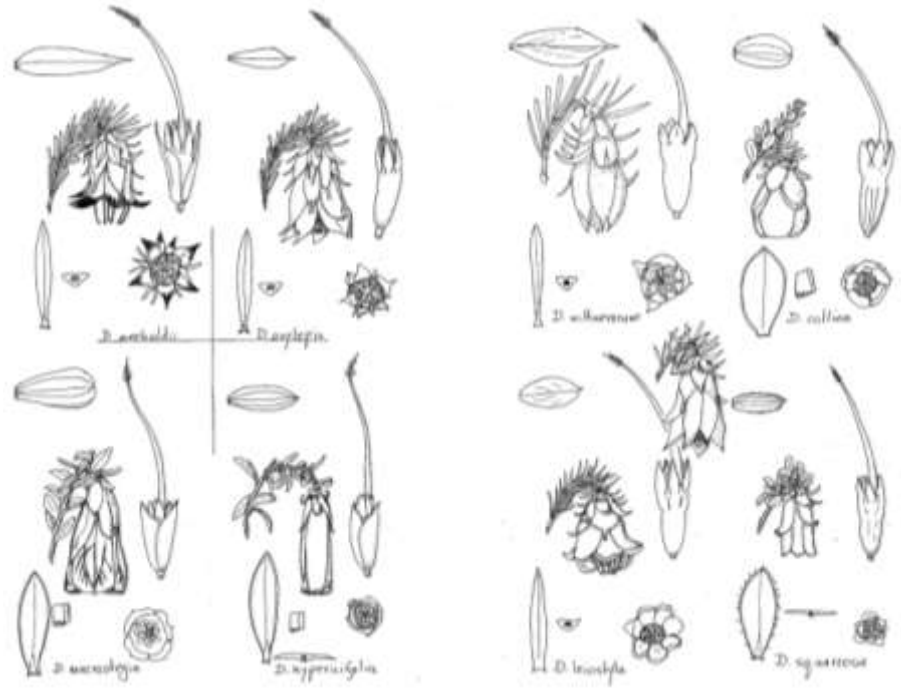


Fig 04: Each of the nine Bells have particular beaut.
Map from Keighery, G.J. (1985) Rediscovering Mountain Bells. Landscope 1(1) 3-11.

Figure 1: Eight of the nine Mountain Bells (*Darwinia nubigena* shown in Figure 1). Each set of species diagrams show clockwise from top left: inflorescence bract; flower (note hairs below stigma on style that holds pollen in oil); bird's eye view of inflorescence (note styles curved towards each other); leaf and inflorescence. Two groups of Mountain Bells are recognised - Western Mountain Bells (four grouped on left): *Darwinia meeboldii*, *D. oxylepis*, *D. macrostegia* and *D. hypericifolia* and the Western and Eastern Mountain Bells (four grouped on right): *D. wittwerorum*, *D. collina*, *D. leiostyla* (typical form centre, top left montane form) and *D. squarrosa*

4 ___ Greg Keighery

Cranbrook Bell (*Darwinia meeboldii*)
A slender erect few branched shrub. Found in the lower drier western portion of the range from the Hamilla hills to SW of Peak Donnelly. First recorded in 1929, it is named after its discoverer the German Botanist Alfred Meebold. A striking species with greenish-white bells tipped red. Although widely grown most plants in Eastern Australia are hybrids with the Mondurup Bell or other species.

Gilliam's Bell (*Darwinia oxylepis*)
Found low down on the tops. Its common name is for Alf Gillam of Cranbrook who insisted that this plant was not *D. lejostyla*, and he was correct. It had, however, been seen and collected by James Drummond from Red Hill in 1848 and named in 1867 from his collection (Drummond returned in January the next year to collect seed, but this does not seem to have been successfully propagated). This was the first Mountain Bell recorded by Europeans. This species has beautiful scarlet coloured bells.

Mondurup or Tulip Bell (*Darwinia macrostegia)*
Found either higher in altitude or on different peaks than the overlapping *D. oxylepis*. A very attractive shrub with flowers bracts that range in colour from white to creamy–green with red veins to fully white or red flowers. Named from material James Drummond collected in 1848, he returned to collect seed in summer 1849; these seeds were widely propagated in Britain and Europe, flowering profusely by 1855 when several coloured illustrations were produced.
Wittwers Bell (*Darwinia wittwerorum*)
Another lowland species, previously included in *Darwinia lejostyla*. This lovely little bell commemorates horticulturist Ernie Wittwer and botanist Magda Wittwer who were associated with Kings Park. The Wittwers loved the flora of the Stirling Ranges and were with Neville Marchant and I when we collected this species. Unfortunately Magda passed away that same night. *Darwinia wittwerorum* occurs on low hills and valleys below Tolls Peak in the central Stirling Ranges, flowers are greenish white at the base tipped rose pink to red.

Central Ranges Bell (*Darwinia hypericifolia*)
A widespread species of numerous peaks in the central Stirling Ranges. A more spreading plant than all the previous species, it produces slender pure red bells, but not bright scarlet like Gilliam's Bell, Again named from plants James Drummond collected in 1848. The seed he collected in the summer of 1849 grew well in Britain and Europe, flowering profusely by 1855 when several coloured illustrations were produced.

Pink Mountain Bell (*Darwinia leiostyla*)
One of the most widespread and variable Mountain Bells this has two very separate forms. One with upturned ends to the bells that show the long styles within and along grows in valleys below Bluff Knoll. This was the form collected by Drummond in 1848. The other form with enclosed styles grows on the summits of peaks stretching from Ellen Peak in the east to Mount Trio in the west and will be named as a separate subspecies this year. *Darwinia leiostyla* is the only Bell whose distribution crosses Chester Pass, which separates the lower Eastern and higher Western peaks. Bells are a uniform light to deep pink.

Fringed Mountain Bell (*Darwinia squarrosa*)
Another species collected by James Drummond in 1848 and the last species of Mountain Bell he recorded. It is again a more scrambling plant and bears small pink bells that are fringed on the margins. This bell is confined to the eastern peaks chiefly above 500 metres

4 ___ Greg Keighery

Yellow Mountain Bell (*Darwinia collina*)
Since he was used to finding only one bell per ascent Drummond never climbed to the top of Bluff Knoll and missed finding this, my favourite bell. When in full flower the sight of dozens of low spreading shrubs, covered by up to a hundred lemon yellow bells shining through the morning mist on the Bluff Knoll plateau is a spectacular sight. First collected by the well-known Western Australian botanical artist and writer of field guides to orchids and wildflowers, Emily Pelloe, in 1922. This species is confined to areas above 500 metres on the Bluff Knoll plateau.

Success Bell (*Darwinia nubigena*)
The last bell to be recorded, and named (Figure 1). I found this species in 1982 on the summit of Mount Success and named it in 2006. The name means dweller in the clouds. This Bell produces small brilliant red bells with short bracts leaving the long styles protruding. This is currently the only Bell confined to a single peak.

The future for Mountain Bells
Although entirely contained within the large Stirling Range National Park, Mountain Bells face a number of challenges. Obviously one is climate change: several occur on the highest peaks of southern Western Australia, where cloud cover is currently frequent and the temperatures consequently mild and the growing season long. Changes to this climate could increase fire frequency and lengthen time to maturity and soil bank seed replenishment.

However, the major current threat is dieback disease (*Phytophthora cinammomii*) to which the Bells and the community they occur in are highly susceptible. Large areas of Stirling Range Thicket in the Park and especially on the Bluff Knoll plateau have been lost to this disease and replaced by sedge lands which are not suitable habitat for the Bells. Rabbits have also invaded the high peaks as the community has opened up and eat the masses of seedlings that occur after fires.

The short lived nature and propensity to hybridize are major issues if one is attempting ex situ conservation of the Bells. The Bells readily hybridize when they meet in the wild. I have recorded several natural hybrids. The Pink Mountain Bell hybridizes with the Yellow Mountain Bell, the Central Mountain Bell and the Success Bell. In cultivation, when many species grow together, numerous hybrids are rapidly generated. I saw a large range of hybrids in the Wittunga Gardens after clearing of some of the old beds and a fire when Adelaide Botanic Gardens assumed control.

Mountain Bells can be readily grown from seed or semi-hardwood cuttings and have been widely but sporadically cultivated in Australia and overseas. They are ideal for large pot culture (even hanging baskets) often forming spectacular displays, with judicious pruning. One should remember that the species are naturally short lived and this is more the case in cultivation. There is still great potential to grow and develop these stunning natives, especially in our diminishing city gardens, as there could be many hybrids and colour forms to select from as well as the beautiful original species.

5 ___ Ellen Hickman

Picturing Plants

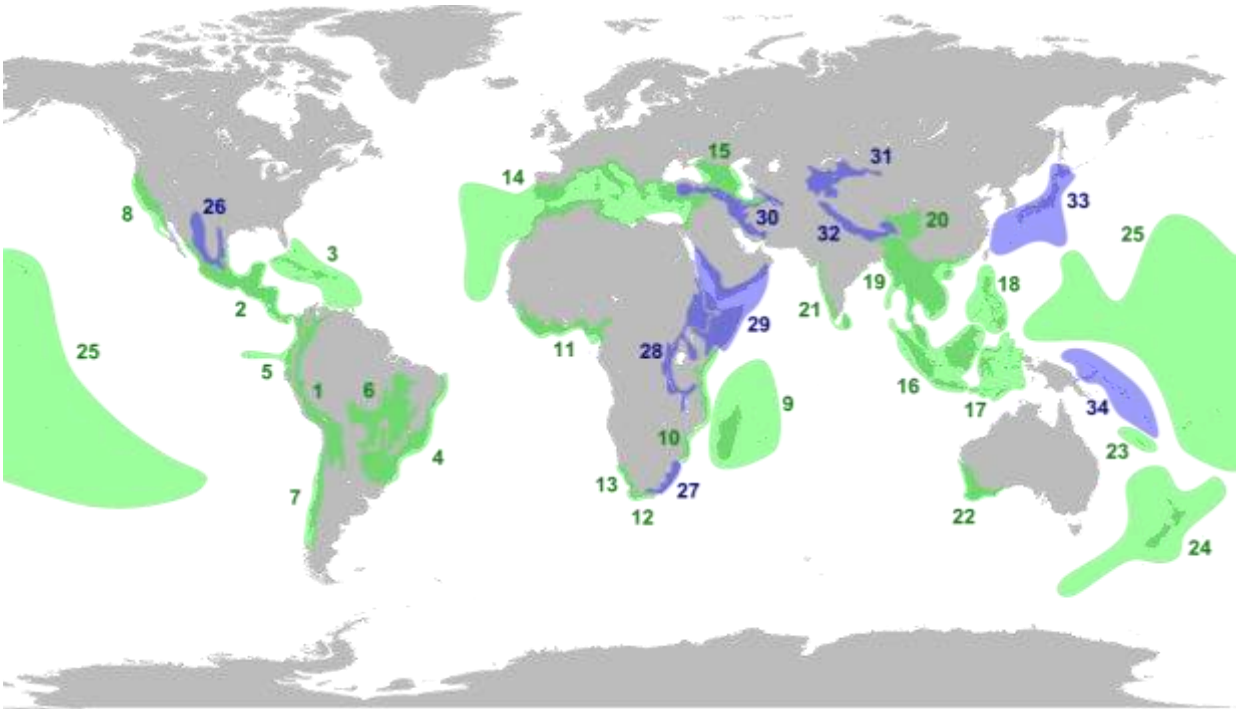
INTRODUCTION
I am a Botanist and a practising Botanical Artist and not an Historian, however I will endeavour in this discourse to outline the history of Botanical Art in Western Australia. It is by no means an exhaustive list of practitioners or their achievement, but I hope it will whet your appetite for the native garden we have here in Western Australia.

Western Australia and particularly the south-west is renowned for its unusual flora and fauna. It is one of 34 Biodiversity Hotspots in the world. The criteria to qualify as a Biodiversity Hotspot, as defined by the Environmentalist Norman Myers in 2000, is that it must contain at least 0.5% or 1,500 species of vascular plants as endemics, and it has to have lost at least 70% of its primary vegetation. Twenty-five areas across the globe qualify under this definition, with 9 other possible candidates (Fig 1.). WA's flora comprises over 9,437 native vascular plants in 1,543 genera and 226 families and a further 1,000 naturalised alien plants.

However not all visitors to WA were taken with its diversity. When Darwin visited King George Sound, the gateway to Australia's only biodiversity hotspot, in 1836, only a few years after its colonisation his comments were;

"…*Since leaving England I do not think we have visited any one place so very dull & uninteresting as K. George Sound*." (Darwin 1836)

Some commentators suggest that Darwin had been away a while by this time and was probably homesick, so maybe we can give him the benefit of the doubt. Many others did not agree with him.



Biodiversity hotspots, original (green)
1. The Tropical Andes 2. Mesoamerica 3. The Caribbean Islands 4. The Atlantic Forest 5. Tumbes-Chocó-Magdalena 6. The Cerrado 7. Chilean Winter Rainfall-Valdivian Forests 8. The California Floristic Province 9. Madagascar and the Indian Ocean Islands 10. The Coastal Forests of Eastern Africa 11. The Guinean Forests of West Africa 12. The Cape Floristic Region 13. The Succulent Karoo 14. The Mediterranean Basin 15. The Caucasus 16. Sundaland 17. Wallacea 18. The Philippines 19. Indo-Burma 20. The Mountains of Southwest China 21. Western Ghats and Sri Lanka 22. Southwest Australia 23. New Caledonia 24. New Zealand 25. Polynesia and

5 ___ Ellen Hickman

Micronesia, and proposed (blue) 26. The Madrean Pine-Oak Woodlands 27. Maputaland-Pondoland-Albany 28. The Eastern Afromontane 29. The Horn of Africa 30. The Irano-Anatolian 31. The Mountains of Central Asia 32. Eastern Himalaya 33. Japan 34. East Melanesian Islands (http://en.wikipedia.org/wiki/Biodiversity_hotspot)

WILLIAM DAMPIER (1651-1715)
So let's step back a bit and look first at William Dampier, who is considered Australia's first natural historian. Despite his colourful life as a pirate, his journeys to and accounts of the East Indies and Australia published in his *A New Journey Around the World* in 1697 impressed the British Admiralty. In 1699 he was given command of *HMS Roebuck* with the commission to explore the east coast of Australia and New Guinea.

He called into Shark Bay on the 6th August 1699 and made the first detail record of Australian flora and fauna.

". . . Most of the Trees and Shrubs had at this time either Blossoms or Berries on them. The Blossoms of the different sort of Trees were of several colours, as Red, White, Yellow, etc., but mostly Blue : and these generally smelt very sweet and fragrant, as did some also of the rest. There were also beside some Plants, Herbs, and tall Flowers, some very small Flowers growing on the ground, that were sweet and beautiful, and for the most part unlike any I had seen elsewhere" (Dampier, 1699).

From his comments, particularly the profusion of blue flowers, it is appropriate then, that William Dampier is memorialised in the blue flowering genus *Dampiera*.

Obviously William Dampier was not a botanical illustrator, but botanical drawings, believed to be made by his clerk, James Brand, where published in his *A Voyage to New Holland* in 1703. These are the first illustrations of Western Australian plant species that we know of. One of the plates included illustrations of *Conostylis styloides, Sida calyxhymenia, Diplolaena grandiflora* and *Beaufortia sprengelioides.*

FERDINAND BAUER (1760-1826)
Probably the earliest most recognisable illustrator of Western Australian plants is Ferdinand Bauer. Born Ferdinand Lucas Bauer in Feldsberg, Austria on 20 January 1760, he was youngest of three sons of Lucas Bauer, court painter to the Prince of Liechtenstein. His early career was guided by the prior, Norbert Boccius, and botanist, Nicholas von Jacquin, before travelling as artist with Oxford Professor John Sibthorp through the Mediterranean illustrating the plants of Greece. On his return from the Mediterranean Bauer went to England where Joseph Banks appointed him as botanical draughtsman on Matthew Flinder's *HMS Investigator,* which set sail to circumnavigate Australia in 1801. Bauer was Bank's second choice, because at 40, Bauer was considered an old man for such an expedition. On top of this the ship was into its third life and was a leaky tub. Bauer discovered his paper was going mouldy and he was not able to use it for his watercolours, so he could only execute pencil sketches. His training with Boccius in the use of a colour code to number his sketches for painting later came in very useful. The colour code for his Australian artworks no longer exists. An earlier colour code of 140 colours is held in the Royal Botanical Garden in Madrid collection. From his sketches, executed during the HMAS Investigator voyage, we can ascertain that the Australian colour code consisted of over 1000 colours. Bauer's method was to sketch the specimen life size, in pencil, in the field. He then colour coded the sketches so that they could be accurately represented when painted at a later stage. His sketch of the Blue Swimmer Crab (*Portunus pelagicus*) with its corresponding colour codes, and later watercolours is illustrated in Watts et al. 1997 (page 26, 117 and 119).

The expeditions onto land at various points discovered a multitude of material to collect and draw. Bauer is recorded as participating in some of the excursions, but as you can imagine with the amount of

material collected, some 500 species of plants at King George Sound alone, and the profusion of work he executed he probably spent a lot of time in his cabin sketching, even into the wee small hours, by candle light.

Obviously, one of his favourite finds was the Albany Pitcher plant (*Cephalotus follicularis*). He produced a number of watercolours of this species. In all, he executed 1,542 Australian plants, 180 Norfolk Island plants, and over 300 animal sketches. Bauer returned to England 1805, and in 1813 published some of his artwork in *Illustrationes Florae Novae Hollandiae*. It was not a financial success largely due to Ferdinand's perfectionism. He could not find anyone capable of either engraving or colouring the plates to his satisfaction, so he was obliged to execute every part of these works in his own hand, occupying considerable time. He returned to Austria where he died on 17th March 1826.

GEORGIANA LEAKE (1812-1869)
Born Georgiana Kingsford on 22 December 1812, she was the daughter of Samuel Kingsford, a miller, from a long line of millers in Kent, England. England in the mid-1820's suffered socio-economic collapse as a consequence of a combination of the Napoleonic wars, agricultural failures and the side effects of industrial revolution.

Following Captain James Stirling's lobbying and the publication of the idyllic picturesque scene of the Swan River, *Clause's Brook* (later to be known as Claisebrook) painted by F.R.Clause from a sketch by Frederick Garling, the scene was set to entice prospective free settlers to the new Swan River Colony. It should be noted that the artist has taken licence in his rendering of the distant mountains, making the scene considerably more romantic than the new settlers discovered on their arrival.

Georgiana emigrated with her parents to the Swan River Colony, arriving on the 26th January 1833.

Her father established his mill in the Swan River Colony despite severe hardships and several setbacks. A painting by Horace Sampson of Perth in 1847 shows Samuel Kingsford's house and mill in the centre of the picture. The house is distinguishable by its steeply pitched roof, more typical of English thatched cottages.

Unfortunately Samuel Kingsford died prematurely in 1840. Soon after Georgiana married George Leake, one of the colony's most influential settlers, and a man much older than herself. Despite the age difference it was a good marriage and Georgiana pursued her favourite pastime painting the profusion of flowers surrounding the colony.

George died in 1849 and Georgiana and her mother return to England in 1853 due to her mother's ill health and the introduction of convicts 'changing the atmosphere' of the colony.

Georgiana lived in London until her death on 27 February 1869.

Little was known of this artist until the rediscovery and publication, of her *Wildflower Album* by the Western Australian Historical Society. Some of the illustrations were obviously framed for display at some stage as the paper has 'mount-burn' but they were probably just on display for the private enjoyment of family and friends.

Georgiana's husband, George Leake, has had more recognition, being immortalised by his friend and botanist, James Drummond, in the naming of *Gastrolobium leakeanum* in his honour.

5 ___ Ellen Hickman

LADY MARGARET FORREST (1844-1929)
Margaret Elvire Hamersley was born on 22 October 1844, whilst her parents Edward and his French-born wife Anne Louise were visiting Le Harve, France on extended holiday from the Swan River Colony.

Her family had considerable land holdings in the new colony. She was educated and accomplished in the modest skills thought desirable for young ladies of her day. She was a vivacious, cheerful girl and despite an accident when she was thrown from a horse leaving her with a slight limp, she was one of the bright social lights of the young colony.

She married John Forrest in 1876. He became first Premier of WA and later a federal politician.

Margaret provided the social background and behind-the-scenes management and diplomacy during her husband's long term of office, accompanying him as he travelled the state and country. On the few occasions that her duties permitted she would slip away to Rottnest, Carnarvon or just as far as South Perth, to sketch and paint the scenes and wildflowers she loved so much.
In September 1889 Ellis Rowan joined Margaret on a painting tour of Carnarvon and Geraldton to paint desert flowers. Their joint exhibition at the Perth Railway Station in November of that year is thought to be the first art exhibition held in the colony.

Among others associations and charities, Lady Margaret was founding member of the Wilgie Club, the first artists' society of WA, and the Karrakatta Club, which endeavoured to broaden women's horizons. Both Margaret River and Elvire River in the Kimberley are named after her.

After her husband's death at sea en route to England in 1918 she lived on quietly in WA with her nieces and nephews, having no children of her own, until her death on 13th June 1929.

Her collection of watercolours was bequeathed to the Art Gallery of Western Australia.

ELLIS ROWAN (1848-1922)
Born Marian Ellis Ryan, on 30 July 1848, in Melbourne, Ellis had a very successful career as a botanical artist both nationally and internationally. She met and spent several weeks painting with the English artist, Marian North, while she was in WA in 1880, and Marian's story inspired Ellis to travel. Ellis's friendship with the government botanist Ferdinand von Mueller also had a profound influence on her career.

Ellis won the highest honour at the Melbourne Centennial International Exhibition in 1888 to the shagrin of other prominent Victorian artists of the time. Tom Roberts, Frederic McCubbin and Arthur Streeton considered the awarding of a gold medal to an amateur flower painter, over more worthy figure and landscape studies, a direct insult!

As mentioned before, Ellis also joined Lady Margaret Forrest on a painting trip north of Perth in 1889. However, after 1892 Ellis was rarely in Australia. When she did return to Australia in 1905 her driving force was to find and record every species of wildflower on the continent.

" My love for the flora of Australia, at once so unique and so fascinating, together with my desire to complete my collection of floral paintings, has carried me into other colonies, Queensland and some of the remotest parts of the great Continent of Australia. The excitement of seeking and the delight of finding rare or even unknown specimens abundantly compensated me for all difficulties, fatigue and hardships." (Rowan 1897).

5 ___ Ellen Hickman

With her health damaged by malaria and fatigue, Ellis died in October 1922 at the aged 72.

Her contribution to the documentation of WA's flora was only a small component of her extensive collections, which are held by the Queensland Museum and National Library of Australia.

EMILY PELLOE (1878-1941)
Born Emily Harriet Sundercombe, on 4 May 1878 in St Kilda, she was one of 2 daughters and six sons to Mr & Mrs J.E. Sundercombe. Following the disastrous bank failures of the 1880's in Melbourne her father decided to start a new life for his family in WA. She moved to Perth with her family in 1893. In 1901 Emily married Theodore Parker Pelloe, a banker. She went with him to Mildura, where he had been appointed bank inspector.

On returning to Perth in 1916 she began a serious study of the State's native flora, encouraged by Mr W.B. Alexander, a biologist at the WA Museum. She wrote and illustrated publications on Western Australia's wildflowers. Her book *Wildflowers of Western Australia* published in1921 was acclaimed as the first book published in English on the WA flora. Her second book, *West Australian Orchids* was published in 1930.

In 1939 she collaborated with then state botanist, Charles Gardner, on a brochure about the State's flora for the Tourist Bureau. She was also a journalist for *The West Australian*. She inaugurated the *Women's Interests* column in 1923 under the pen name 'Ixia'.

She was a keen horsewoman, and she and her horse were a familiar sight in and around Perth. She donated, and is memorialized, in the Emily Pelloe Prize for best equestrian turnout at the Perth Royal Show.

Emily died prematurely of heart failure while riding on 15 April 1941. The following year her husband presented her collection of over 400 paintings to University of Western Australian, where they were held in trust at the University's Botany Department until the building of a future University Women's College. Most of the paintings are now housed at St Catherine's College, with a few remaining at the Botany Department.

EDGAR DELL (1901-2008)
Edgar Dell was born in England on the 28 November 1901. He migrated to WA in 1924. He bought a block in Kalamunda, which he cleared to establish an orchard.

During the depression he earned a living cutting timber from the bush and painting wildflowers for The West Australian Newspapers Ltd. They were published once a week over a couple of years in a colour supplement to the *Western Mail*, accompanied by Charles Gardner's botanical descriptions. They were so popular that they were compiled into a book in 1935 called *Western Australian Wildflowers.* This publication has undergone several reprints since that time, although each reprint contains less and less of Edgar's artwork. His illustrations were replaced by photographs, which was the modern medium of the time, but in retrospect his paintings have a timeless clarity.

Little is known of his later life. His interest in flowers found an outlet in their cultivation, which was a tradition carried on by his sons.

He died in 2008, at the age of 106.

5 ___ Ellen Hickman

RICA ERICKSON (1908-2009)
Frederica Lucy Sandilands was born on 10 August 1908 in Boulder. After her father was invalided in WW1 the family moved to Kendenup to begin an orchard. Here she met Emily Pelloe when Emily visited the area in 1921 to promote her newly published book: *Wildflowers of Western Australia*.

In 1924 Rica started teaching in country schools. In 1927 she attended Claremont Teacher College for the required one year of training to become a qualified country teacher. While teaching at Youngs Siding she became interested in the native orchids, and started collecting and painting them. Rica used as a reference Emily Pelloe's book: *West Australian Orchids*, which had recently been published.

She moved to the wheatbelt in 1934 to become teacher at Bolgart. There she met and married Sydney Erickson, a share farmer, in 1936. They had four children whom she home schooled. They lived not far from *Hawthornden,* James Drummond's historical home, fuelling an interest in the Drummond's story. During this time she wrote and illustrated *Orchids of the West* (1951) and *Triggerplants* (1958), as well as being employed as a botanist on wildflower coach tours. In 1965 the couple travelled to Europe where Rica spent time studying Drummond's herbarium collection at Kew.

On returning to Australia they retired from the farm and moved to Perth where she completed her third illustrated plant book: *Plants of Prey* (1968), and embarked on her historical writings.

Rica received a number of awards including Citizen of the Year for her contribution to the arts and an honorary Doctor of Letters from UWA for her contribution to botany and history in 1980, the first of four honorary degrees she received. In 1987 she was awarded Order of Australia for services to arts, history and literature.

Rica was included in the *Wildflowers in Art* exhibition staged by Janda Gooding, then curator of the Art Gallery of WA in 1991. Here many current botanical artists of WA met for the first time. Six of these, including Rica, formed an organised group titled the Botanical Artists Group, soon to be referred to as the BAGs. The members gave each other names like Tea Bag and Paper Bag, and Rica nominated herself as the Old Bag. However she was more affectionately known as the Everlasting Bag.

In 1996 a nature reserve in Calingiri, north of Perth, was named the Rica Erickson Nature Reserve in her honour.

Her husband died in 1987, and Rica died 8 September 2009 at the age of 101.

Rica's tenacity and thirst for knowledge led her to meet and correspond with many people who encouraged and enabled her career. She was able to return the favour to many who followed her, myself included.

MARGARET PIERONI (1936-
Margaret Edith Hellmers was born on 11 April 1936 at Cabramatta, NSW. At the time Cabramatta was an outer suburb of Sydney and surrounded by bush. It was here, and during holidays on the south coast at Durras, that Margaret started collecting flowers and painting them in watercolour.

She studied art at the National Art School, East Sydney Technical College, then worked as a commercial artist in Sydney, before working abroad, mostly in London. She married Francesco Pieroni in 1961.

In 1969 she was diagnosed with acute leukemia and underwent chemotherapy. On recovery in 1973 she fulfilled a life-time desired to see the wildflowers of WA when she travelled to Perth, accompanied by

her parents. The following year she moved with her husband to Perth, where she started painting wildflowers, and joined the Wildflower Society of WA. Margaret's training in advertising and commercial art with her skills for accurate and fine work paved the way to a comfortable move into botanical art.

In 1981 she commenced a project to illustrate all the Verticordias. These were published in *Verticordia: The Turner of Hearts* in 2002.

Margaret paints in a classical style, with the main subject accompanied by dissections.
Margaret says she is not a patient person so she doesn't spend hours doing detailed preparatory drawings. She might draw some pencil lines to guide her, but when she is painting she is usually 'drawing with the brush'.

One of Margaret's favourite subjects are Dryandras. In 1987 she became leader of the Dryandra Study Group and commenced illustrations for a book on them. Since then the genus *Dryandra* has been incorporated into the genus *Banksia*.

In 2004 Margaret purchased an acre block in Denmark, and built an environmentally friendly home with a purpose-built studio to get the best light for her painting. She is currently inspired by the flowers that appear in her native bush garden. She continues to paint, publish and be involved with numerous conservation groups across the State.

PHILIPPA NIKULINSKY (1942-
Philippa Mary Compton was born on 7 October 1942 in Kalgoorlie, where she developed a love of the arid country. She trained at Claremont Teacher's College specialising in art, and taught at various secondary schools and tertiary institutions. She married Alex Nikulinsky in 1961, and they established their home in Dalkeith where they raised their 4 sons. From here she and Alex head out on adventures in a convey of their two 'troupies', and spend weeks in isolated areas exploring, collecting and painting.

Philippa likes to understand the whole story of a plant, where and how it grows, what surrounds it, and the incidents and accidents of nature that give it character – such as the insect-chewn edges of a leaf. Her field books are full of plants pulled apart and stuck down on the page, surrounded by her notes and sketches on colour, form and the surrounding environment.

Philippa has had numerous joint and solo exhibitions both nationally and internationally, and published various books including *Banksia menzesii* (1992), *Life on the Rocks* (1999), *Soul of the Desert* (2005) and *Cape Arid* (2012), as well as being a contributing illustrator in numerous other publications. She has produced images for a range of china that has taken West Australia's distinct flora to many homes and dining rooms across the world.

Although Philippa works closely with scientists her real interest is in the visual possibilities of plants and animals. She is surprised at her success, putting it down to luck. It has less to do with luck and more to do with her passion for, and her ability to express the 'soul' of her subjects that makes a real connection with the viewer.

KATRINA SYME (1947-
Born Katrina (Katie) Staniford, 29 March 1947 in Gloucestershire, England, she emigrated with her family in 1953, initially to Donnybrook and then Harvey. In 1966 she trained as a schoolteacher at Claremont Teacher's College.

5 ___ Ellen Hickman

In 1968 she married Alex Syme and they lived at Wubin in the northeastern wheatbelt. Following years of drought the family moved to Denmark on the south coast in 1976.

During a family holiday to Tasmania in 1982 she became fascinated with macrofungi, and unable to buy a guide to these strange organisms, she began to record her findings by painting them in watercolour.

In 1986 Katie had her first solo exhibition and started conducting workshops in botanical art, fungi identification and textiles.

In 1988 she was awarded a Churchill Fellowship to study botanical illustration and attend meetings of the British Mycological Society. She was awarded to grant from the Australian Geographic Society in 1989 to purchase a microscope to help with drawing spores and the cellular structure of her specimens. The stage was now set for her career to blossom both nationally and internationally - exhibiting her artworks, running workshops and publishing her findings in both arts and science journals.

Like many botanical artists with a passion for her subject, she suffers the dilemma of dividing her time between art and scientific research, especially with the pressing threat of climate change.

PENELOPE LEECH (1947-
Penelope Jane Leech was born on 5 September 1947, in Banbury, Oxfordshire, England. At school Penny was interested in drama, music and dancing, and in 1968 she was awarded a Diploma in Dramatic Arts from London University. She emigrated to WA in 1974, and worked in a variety of jobs including drawing architectural subjects on commission. She started to exhibit these from 1978 onwards.

In 1980 Penny moved to Mt Barker and began painting botanical subjects, initially fascinated by Eucalypts. In 1986 she moved to Toodyay to work caring for disabled people. She continued to exhibit during this time, and was a member of the Botanical Artist Group from its inception in 1991. She left to pursue work options in 1995, then rejoined ten years later in 2005. At the same time she moved to Denmark, where she continues to paint, opening her home studio to the public for the Southern Art & Craft Trail each year in Spring.

On her collecting walks in Spring and Summer flowers are favoured subjects, but when flowers are scarce she is as interested in found objects such as fragments of glass, a feather, a dead insect or even a shiny bottle top.

Penny's studio faces east, receiving the morning sun. Her old drawing board is propped up against a box. She has her subject in front of her or held in her hand, and she uses a dry brush technique with watercolour to reproduce her subject. The blank white paper is sometimes intimidating, but once she has made the first mark she feels more comfortable. The amazing thing about Penny's work is she never uses pencil to draft out her composition, preferring to start straight in with watercolour.

PATRICIA DUNDAS (1952-
Born Patricia Joy Ford, 15 February 1952 at Mt Barker, she grew up on a farm in Woogenellup (between the Stirling and Porongurup Ranges). She attended boarding school in Perth, started a biology course before changing to pursue a career in graphic arts, and graduating with an Associateship in Design from the Western Australian Institute of Technology, now Curtin University. She married Craig Dundas, travelled and worked overseas, and within Australia.

In 1981 Pat began a freelance career as graphic and botanical artist. Exhibiting, undertaking commissions, and illustrating for publications, particularly *The Bushland Plants of Kings Park* (1988) and

5 ___ Ellen Hickman

cover illustrations for *Flora of the Kimberley* (1992) and *Flora of Australia: Proteaceae Vol 2 – Grevillea* (1998).

In 1991 she embarked on a major project to illustrate all the orchids of WA, over 400 species including hybrids. She started with the south-west species and then secured funding to include orchids of the Kimberley. This funding enabled her to engage a botanist and using various forms of transport – planes, helicopters, 4WD and motorbike - they made a number of trips, discovering new species in the process.

In 2003 Pat moved to Pemberton where she opened *Botanica Gallery* which specialised in the work of the Botanical Artists Group. The gallery was open for 5 years while she worked on the orchid illustrations. The artworks were published in *Orchids of Western Australia* (2008).

Although orchids have been her priority, her passion to paint extended to seeds, pods, fruits and fungi, which she composed into patterns. Her fascination with colour extends to experimenting with plants and organic substances to make natural dyes for textiles. On completion of the orchid project she has put more energy into her textiles projects.

ELLEN HICKMAN (1968-
Born Ellen Joy Hickman, on 8 October 1968, in Tenterden, England, I emigrated with my family as 'ten-pound-poms' in 1971 to Manypeaks, east of Albany, but work opportunities soon took my family to Perth.

When I left school I had to make a choice between my two passions - Art or Science. Art was portrayed as a very difficult discipline in which to gain employment, so I chose to do a Bachelor of Science, majoring in Botany, at The University of Western Australia.

On finishing my degree I worked for three years as a research assistant for Professor John Pate, illustrating a book on the plant family Restionaceae (Australian rushes). With this work I found a way to combine my two passions - Art & Science. The book was published in 2000 with illustrations of the 150 Australian species of Restionaceae, and was awarded the Henry Allan Gleason Award from the New York Botanic Gardens for the most outstanding biological publication of that year.

In 1995 I moved back to Albany to start work as the Rare Flora Officer for the Government Conservation Agency - CALM. During this year I was also invited to join the BAGs, which had formed in 1991.

With my work commitments at CALM I was not getting enough time for my art. Art is something I have to do. I have to eat, I have to sleep and I have to draw, it's a fundamental thing I to have to do to be healthy. So, in 1999 I moved to Melbourne to study a Diploma of Visual Arts majoring in illustration. This led to the expansion of my illustration work into different genre, such as childrens' books.

In 2001 I returned to Albany to start my own environmental consulting business and to work as a freelance illustrator. I produced illustrations for *Hooray for Chester* (2003), and *Tuart Dwellers* (2008).

However, my main passion is botanical illustration. I have been inspired by Bauer's classical compositions of whole plants combined with dissections to show as much of the life cycle of the plant as possible in each artwork. I work in watercolour pencil, but I use them dry. I will make preliminary sketches and colour studies before embarking on the final illustration. By then it is a matter of just 'colouring-in'. When working in watercolours you mix up the colour you want before applying it; whereas in pencil the colours are fixed, so it is a matter of mixing on the page. Layering the colours one

on top of the other until you get the right shade, gives the work its thick lustrous look. People are surprised this effect is achieved just from coloured pencil.

In 2001 I started a major project illustrating the Haemodoraceae plant family, which includes the Kangaroo Paws. The centre for diversification of this family is south west Australia, with 80% of the known species occurring here, and 2% occurring outside Australia. Over the last few years I have obtained funding through research grants and a Winston Churchill Fellowship in 2009 to travel to do studies of the species in South Africa, North, Central and South America.

In 2012 I embarked on a PhD to again combine my two passions. I am undertaking an interdisciplinary study that aims to investigate the role of botanical illustration in biodiversity science, especially in light of the explosion of the use of molecular techniques in plant classification. I am using the Haemodoraceae family as a case study, and hope to increase our knowledge of the poorly known WA genera of this family; *Tribonanthes* and *Phlebocarya*.

CONCLUSION

I prefaced this discourse by saying I wasn't a historian. Despite this, I enjoyed the journey of learning more about my predecessors and contemporaries. I want to conclude with a few observations.

Pre-colonisation botanical illustrators were predominantly men. This is not surprising as it was a dangerous occupation to go to sea on an expedition and many crew never returned.

With colonisation, the intrepid women who braved the austere conditions of the new colony found solace in painting the wildflowers around them. This intrepid characteristic led these women, and those that followed in their footsteps, to spread their wings and venture to remote areas of the country or to distant shores in search of subjects to paint.

Maybe the lack of male illustrators in more contemporary times is due to the invention of the camera, which provides a mechanical tool for recording the plants (we know how much boys love their toys!).

Botanical illustration may have been a career in the past, but in contemporary times it is more of a vocation, requiring the practitioner to have other sources of income (e.g. teaching, graphic arts or science).

Although Botanical Art is often 'painted' as the lowest form of art, it still has a great appeal around the world, and goes through revivals, especially in time of prosperity.

In my study of Botanical artists my most enduring observation is the common driving passion that each of these artists have is to share with others their love of plants and demonstrate their amazing diversity.

5 ___ Ellen Hickman

BIBLIOGRAPHY

William Dampier

- Hewson, H. (1999) *Australia: 300 Years of Botanical Illustration*. CSIRO Publishing, Melbourne.
- http://en.wikipedia.org/wiki/William_Dampier

Ferdinand Bauer

- http://adb.anu.edu.au/biography/bauer-ferdinand-lukas-1754
- http://www.nhm.ac.uk/nature-online/art-nature-imaging/collections/art-themes/drawingconclusions/more/root_more_info.htm
- Watts, P., PomFrett, J.A. & D. Mabberley (1997) *An Exquisite Eye*. Historic Houses Trust of NSW, Sydney.
- http://anpsa.org.au/APOL21/mar01-6.html
- https://www.asba-art.org/article/collections-real-jardin-botanico-de-madrid

Georgiana Leake

- Love, M.J. & Sherwood, B.R. (2010) *Georgiana Leake's Wildflower Album. Western Australia's First Botanical Artist.* Royal Western Australian Historical Society, Perth..
- http://www.anbg.gov.au/biography/leake-georgiana-mary.html

Lady Margaret Forrest

- Gooding, J. (1991) *Wildflowers in Art*. Art Gallery of Western Australia, Perth.
- Popham, D. (1978) *Reflections : Profiles of 150 Women who help make Western Australia's history*. Carroll's Pty Ltd., Perth.
- http://en.wikipedia.org/wiki/Margaret_Forrest

Ellis Rowan

- Johnson R. (2007) *Ellis Rowan Adventures of a flower hunter*. Australian Heritage.
- http://adb.anu.edu.au/biography/rowan-marian-ellis-8282
- http://en.wikipedia.org/wiki/Ellis_Rowan
- https://www.anbg.gov.au/biography/rowan.biography.html

Emily Pelloe

- Stewart, N. (1987) *As I Remember Them*. Artlook Books, Perth.
- Pelloe, E.H. (1921) *Wildflowers of Western Australia*. C.J. DeGraris Publishing House, Melbourne.
- Pelloe E. (1929) Floral Glory In: Colebatch, Sir Hal (editor) *A Story of a Hundred Years:Western Australia 1829-1929*. F.W. Simpson, government printer, Perth.
- Pelloe, E.H. (1930) *West Australian Orchids*. C.J. DeGraris Publishing House, Melbourne.
- http://en.wikipedia.org/wiki/Emily_Pelloe
- http://adb.anu.edu.au/biography/pelloe-emily-harriet-8012
- **http://www.cpbr.gov.au/biography/pelloe-emily.html**
- https://www.library.uq.edu.au/fryer/hayes_exhibition/nature.html

Edgar Dell

- http://www.anbg.gov.au/biography/dell-edgar.html
- http://en.wikipedia.org/wiki/Edgar_Dell
- Gardner, C.A. (1992) *Wildflowers of Western Australia*. St Georges Book, Perth.

Rica Erickson

- Gooding J. (2008) *Brush with Gondwana*. Fremantle Press, Fremantle.
- Erickson, R. (1951) *Orchids of the West*. Paterson Brokensha, Perth.
- Erickson, R. (1958*) Triggerplants*. Paterson Brokensha, Perth.
- Erickson, R. (1968) *Plants of Prey in Australia*. Lamb Paterson, Perth.
- Erickson, R. (1969) *The Drummonds of Hawthornden*. Lamb Paterson, Perth.
- Erickson R. (2005) *Rica Erickson: A Naturalist's Life*. UWA Press, Crawley.

Margaret Pieroni

- Gooding J. (2008) *Brush with Gondwana*. Fremantle Press, Fremantle.
- Cavanagh, T. & Pieroni, M. (2006) *The Dryandras*. Australian Plants Society, Melbourne.
- George, E. & Pieroni, M. (2002) *Verticordia: The Turner of Hearts*. UWA Press, Crawley and ABRS, Melbourne.
- Pieroni, M.(1993) *Discovering Wildflowers of Western Australia*. Quality Publishing Australia, Perth.

Philippa Nikulinsky,

- Gooding J. (2008) *Brush with Gondwana*. Fremantle Press, Fremantle.

5 ___ Ellen Hickman

- Nikulinsky, P. (1992) *Banksia menzesii*. Fremantle Arts Centre Press, Fremantle.
- Nikulinsky, P. & Hopper, S.D. (1999*) Life on the Rocks: The Art of Survival*. Fremantle Arts Centre Press, Fremantle.
- Nikulinsky, P. & S.D. Hopper (2005) *Soul of the Desert*. Fremantle Arts Centre Press, Fremantle.
- Nikulinsky, P. & Nikulinsky, A. (2012) *Cape Arid*. Fremantle Press, Fremantle.

Katrina Syme

- Gooding J. (2008) *Brush with Gondwana*. Fremantle Press, Fremantle.
- Bougher, N.L. & Syme, K. (1998) *Fungi of Southern Australia*. UWA Press, Crawley.

Penny Leech

- Gooding J. (2008) *Brush with Gondwana*. Fremantle Press, Fremantle.

Patricia Dundas

- Gooding J. (2008) *Brush with Gondwana*. Fremantle Press, Fremantle.
- Dundas, P. & Bennett, E.M. (1988) *The Bushland Plants of Kings Park, Western Australia*. Kings Park and Botanic Gardens, Perth.
- Brown, A., Dundas, P., Dixon, K. & S.Hopper (2008) *Orchids of Western Australia*. UWA Press, Crawley.

Ellen Hickman

- Gooding J. (2008) *Brush with Gondwana*. Fremantle Press, Fremantle.
- Meney, K.A. & J.S. Pate (1999) *Australian Rushes: Biology, Identification and Conservation of Restionaceae and Allied Families*. UWA Press, Crawley.
- Foti, R. (2003) *Hooray for Chester*. Benchmark Press, Melbourne.
- Ramage, J. (2008) *Tuart Dwellers*. Department of Environment & Conservation, Perth.
- Hickman, E. and Ryan, J. (2012) *Two with Nature*. Fremantle Press, Fremantle.

6 ___ Susan Groom

A Cooperative Approach:
The Economic Heart of a Rural Community

After Albany was settled in 1826 it wasn't long before a number of expeditions set out in various directions looking for land suitable for agriculture. The rich volcanic soil to the north of Albany near the Porongurup Ranges was soon recognised. By the end of the 1800s with the advent of the rail link and the Land Selection Act, parcels of land became available for purchase.

In order to grow produce in the region, the heavily forested land had to be cleared by hand. Settlers planted apple orchards because they required a relatively small amount of clearing. By 1908 there were fifteen commercial orchardists in the Mount Barker District but by 1910 the number had climbed dramatically to seventy-five.

The catalyst for this was the opening up of the apple export market to Europe. Western Australian apples could be sent to Europe in a shorter time than from the Eastern States because of the Suez Canal. The fruit arrived in Europe at the end of winter when local supplies were exhausted and as the only fresh fruit around brought very high prices. The return for a bushel of apples in 1908 was about the same as a weekly wage for a farmhand.

Orchardists in Mount Barker soon realized that they needed to be organised to become competitive as exporters. They played a key role in forming the Fruit Growers Trading and Shipping Association of Western Australia, or Associated Fruit Growers as it came to be called.

In 1911 the Mount Barker Branch amalgamated with the Central Fruit Growers Association in Perth to form the Western Australian Fruit Growers Association. This gave both organisations political leverage to help develop and protect their industry, from experiments by the Agricultural Department to import controls on apples from other states or foreign countries with codling moth.

Within a few years, Mount Barker's fruit growers had become an effective industry group that could make the needs of its members known to others. By 1911, despite fierce competition from America, Mount Barker's export apples were gaining a reputation for quality in Britain.
Exports to Germany were also attracting record sales. Dunns Seedling apples were particularly popular at that time.

Despite the huge potential for their produce, underpinned by a reputation for quality, the Mount Barker orchardists faced a number of very real problems in marketing their fruit for export. Producers complained of crippling costs:

'Successive Governments extract excessive taxation, penalise him in the price of fruit cases and railway freights and damage his product in transporting it. The commercial magnates have increased the price of his requisites but have been unsuccessful in increasing the returns for fruit… Co-operation, loyalty and self help are essential to avert the impending crash,' cried *The Primary Producer*, the newspaper representing Western Australian primary producers.

The greatest blow to Mount Barker's fledgling fruit export industry however was the outbreak of war with Germany in 1914. Not only did the orchardists lose their lucrative trade with Germany but they also lost their capacity to transport their produce to Britain. By 1917 exports had virtually ceased. German U boats and raiders were sinking merchant ships as part of their strategy to cut off Britain's food supplies.

6 ___ Susan Groom

Despite the war the Mount Barker fruit industry continued to move forward, with the construction of a packing shed and by sourcing cheaper packing cases. The suitability of Mount Barker's rich soil, cool climate and reliable rainfall for successful apple growing had been well and truly realised but one major hurdle for orchardists remained – that of not being able to keep their fruit in cool storage. Once picked apples and pears had to be sold as quickly as possible, no matter what the supply and demand or availability of shipping.

The need for cool storage to allow the Mount Barker fruit industry to grow was the major catalyst for the establishment of the Mount Barker Co-operative Ltd. At that time primary producers, whether wheat and sheep farmers, dairy farmers or orchardists, were taking control of their industries, forming structured networks that would come to define rural Western Australia. The Co-operative model was developed in the United Kingdom and Ireland. In Western Australia the movement's catchcry of 'Co-operation, Organisation and Education' was constantly reinforced as it extolled the benefits of a democratic business structure that focussed on community support and development.

Refrigeration was a new and extremely expensive technology in the early 1900s, particularly for places like Mount Barker, which had no electricity supply. With Government finances committed to defence during the war years, the only answer for Mount Barker fruit growers looking to develop their industry was to pool their own resources. On 21 October 1918 a meeting of local fruit growers was held at the Mount Barker Hall where the Mount Barker Co-operative was formed and money was raised for building a cool store. Members of the co-operative included men of vision and influence. The first Chairman was James McNeil Martin, whose uncle Neil McNeil was a primary figure in the State's timber industry. Timber was readily sourced and work began straight away on what was to become the largest cool store in the Southern Hemisphere. It was completed in time for the next crop of apples and each shareholder was entitled to a portion of the storage space. The company's export markets went from strength to strength winning awards at Wembley stadium in London.

Meanwhile Mount Barker's wealth from fruit exports gained the attention of a flamboyant investor, Clement John De Garis, who has been described as 'Australia's greatest confidence inspirer'. Although he wasn't directly involved with the Co-operative his land development scheme north of Mount Barker at Kendenup greatly extended the amount of orchards in the district, which were later to become the main suppliers to the Mount Barker Co-op. DeGaris had come from one of Mildura's pioneering fruit growing families and headed several organisations including the Australian Dried Fruits Association, Tivoli Theatres and a newspaper produced by Sunraysia, a dried fruit company. He called his new company in the West, The Kendenup Closer Settlement Land Development Company. He sent out brochures all over the world showing paddle steamers coming up the Kalgan River. Apparently, according to one of the locals, an Englishman with a tea plantation in Ceylon came out and wanted to know where the paddle steamer was. Although the cost of land was ten times that which could be bought from the Government, De Garis attracted hundreds of settlers with guarantees to purchase their produce for ten years. He built a number of facilities at Kendenup including a dehydrator to dry the produce of the settlement.

De Garis lived with his family and general entourage at Kendenup House, which was built by the Hassel family who had originally owned the land. He was known for his lavish parties and stylish appearance and would announce in the newspaper he produced when he would be arriving by train so that he could be met by a welcoming committee.

The settlers quickly set out to establish their orchards but the scheme could not withstand the time it took for those orchards to become productive. When De Garis lost credibility with the Australian Banks he travelled to America to try to secure finance to support the mortgages he had set up. His scheme had

collapsed by 1923 and most of the Kendenup settlers were forced to leave the district. De Garis tried to slip away with his secretary to New Zealand, faking his own suicide by leaving his clothes on the beach.

A Royal Commission into the collapse into the Kendenup Land Development Company found: 'In the establishment and direction or the Company is to be seen evidence of fine conceptions, undoubted energy and admirable resolution, hand in hand with improvident and questionable finance, illogical and unsound contracts, and palpable blindness to the obvious limitations of credit.'

Despite this setback De Garis set out on another venture: this time he told one of his Kendenup associates it was to find oil in Kendenup. He claimed that he had raised 2.5 million pounds and was going to America to raise more money. When this loan was unsuccessful, De Garis gassed himself.

Those who stayed on at Kendenup bought out the other orchards and joined the Mount Barker Co-operative. By 1927 it was shipping 108,000 cases of apples and pears to Europe and selling 52,000 cases of fruit locally or to other states. It sought to gain greater political influence through having its secretary, Archibald Booth, nominate for a seat in the Country Party. Although he failed to win the seat, his call for extending Albany as a port and improving local railway services was acted upon. Albany, not Fremantle became the major fruit exporting port in Western Australia.

By 1928 the company was able to repay its loan, pay shareholders interest on capital invested and had distributed bonuses to the extent of three times the original amount invested by the fruit growers. The company's strong financial position gave the directors confidence to enter the retail sector the following year. Then the Depression hit. Export markets for primary produce fell away dramatically affecting Western Australia more that any other State. By 1930 the number of ships transporting the Mount Barker Co-operative's apples and pears halved and the number of cases exported fell to one fifth of the previous season.

During the Depression, co-operatives were able to provide some protection for members by extending credit; however, the situation was made more difficult when banking organisations refused to allow their creditors to pay accounts to co-operatives. Despite these difficulties, the Mount Barker orchardists survived the Depression and by 1932 the port at Albany was despatching a quarter of a million cases of fruit.

After being graded, packed and labelled at Mount Barker the fruit was loaded onto a train then transferred directly onto the waiting ships. Timing was crucial to make sure the fruit arrived as fresh as possible. To increase sales the Co-op set up an office in London in partnership with the Westralian Farmers Co-operative (which later became known as West Farmers). Having this base also allowed the Co-op to better cater for public demand and to predict future trends within the industry. The most popular export apple, Granny Smith, had a long shelf life. By 1939 the company had established an Australian record for packing apples. This milestone was acknowledged by the then Western Australian Premier, James Mitchell, who had been a strong supporter for the development of the State's rural industries.

When WW11 broke out the Co-op came under the authority of the Federal Government through the Controller General of Food. Finance was supplied to the Co-op to build a dehydration plant to produce dried apples for Australian and American troops. Italian prisoners of war were allocated to orchards to make up the labour deficit. More women were also deployed in the orchards and packing shed through the Women's Land Army Scheme. Many of these women remained in the district. During the war the Co-op built a packing shed at Kendenup where much of the fruit was now being grown. They also built a

new cool store in response to a Government offer to remunerate companies that built infrastructure to assist the war effort.

By 1950 the Western Australian fruit industry had fully recovered, including resuming exports to Germany. The Co-op's retail sector rapidly expanded following the War with Mount Barker becoming a member of Foodland, a wholesale co-operative for independent grocers. This has since evolved and merged with other companies to form the IGA chain.

Post war developments in technologies, particularly fork-lifts and bulk bins reduced costs and increased the Co-op's competitiveness. In 1959 the original Chairman, James Mc Neil, was awarded an MBE for his life's work in setting up such a substantial community owned legacy.
In the 1960s increased competition from countries such as Argentina and European countries that had planted orchards after the war resulted in a reduction of British imports. The golden era of Mount Barker's fruit industry had passed, but the Co-op continued to find new ways to promote its fruit. The catchcry was 'Eat More Fruit' and an annual apple festival was organised with the selection of an apple queen to travel to other countries to promote Mount Barker's produce. Efforts were made to break into the difficult Japanese market, but without success. The Japanese cited a fear of codling moth and fruit fly as the reason for not taking apples and pears.

However despite the great disappointment at the decline of the fruit industry, members of the Co-op's board were determined to keep the company afloat. The company's lifeboat at this time was its retail sector until it was able to reinvent itself as a seed cleaning business. Clover was a popular nitrogen fixing pasture for newly developed land. It had originally been brought into the country stuck onto the saddlecloths of camels of Afghan drivers.

After the war, with the demand to open up more land for returned soldiers, coupled with the advent of bulldozers, broad acre farming rapidly expanded in the areas around Albany. Early efforts to harvest the clover consisted of a tractor pulling a gang of rollers with sheepskins wired on. The clover bur stuck to the roller and as it rotated was swept off into a hopper behind each roller. Later methods of harvesting included machines that sucked up the clover bur.

The seed cleaning plant became a highly profitable enterprise for the Mount Barker Co-operative. It was able to clean seed for the establishment of other pastures and grains grown in the district and was gradually expanded to become one of the most modern in the State. The Mount Barker Seed Works would buy and sell seed for the local farm market, act as an agent to sell on behalf of growers and buy and sell as a wholesaler. The finance available through the Co-op made opportune buying possible where substantial quantities could be bought and stored and then sold as the season developed. Samples of the different seeds cleaned and sold through the Co-op had to go to Perth to the seed laboratory at the Agricultural Department where the seed was germinated and analysed for weed and dirt. The seed had to be 98 percent pure with minimum germination of 80 percent.

Meanwhile the apple industry had come to a standstill with Britain joining the European Common Market. The old packing shed closed its doors in 1975 and orchardists began pulling up their apple and pear trees and relying on broad acre farming. The Co-op Board came up with the idea to turn the old building into a modern shopping complex. It was soon highly profitable and extended its business to supply bulk merchandise fuel.

By the end of the 1970s, a new enterprise emerged for the seed plant. By that time most farmers had established their pastures and the sale of clover had dropped. Canola had been introduced during the 1970s, but crops were destroyed by disease. Once scientists developed a disease resistant variety, the

seed plant began contracting growers to produce canola seed. Employees of the seed plant had to make regular checks by helicopter for weeds in the canola crops that would contaminate the seed.

During this period commissions from the sale of livestock and wool were greatly increased by the Co-op extending its links with Wesfarmers. In the first two years of the 1980s, Co-op shareholders of this small rural community received a quarter of a million dollars in cash or debentures payable with interest. The Co-op was also able to provide considerable financial support for community projects.

Since that time the Co-op has been a major contributor to many community events and much of its built infrastructure. It regularly joins with the community based Bendigo Bank and the Mount Barker Shire Council to celebrate these locally sponsored initiatives. And just as the Co-op was able to help its members rise above the Depression of the 1930s, so too was this business model able to avoid the impact of the 2008 global economic crisis. In an era of multi national takeovers and interdependent financial institutions, Mount Barker's Co-operative continues to provide a sustainable economic heart for the community to which it belongs.

Reference:

Based on the publication, *It Started with Apples: the Story of the Mount Barker Co-operative Ltd*, written by Susan Groom, published by the Mount Barker Co-operative Ltd, 2009

Caroline Grant - Endnotes

[i] "Great Southern Development Commission: Economy," Goverment of Western Australia, http://www.gsdc.wa.gov.au/region/economy.
[ii] SWALSC, "Kaartdijin Noongar: Sharing Noongar Culture," South West Aboriginal Land & Sea Council, http://www.noongarculture.org.au/noongar/.
[iii] Blackwell, June 2014.
[iv] *The Shorter Oxford English Dictionary*, 2 vols., vol. 1 (Oxford: Oxford University Press, 2002).
[v] Brian Short et al., *Apples and Orchards in Sussex* (Lewes Sussex: Action in Rural Sussex and Brighton Permaculture Trust, 2012). p. 82
[vi] Caroline Gammell, "The Legal Definition of a Garden," *The Daily Telegraph*, 4 July 2008.
[vii] Nan Phillips, "Vancouver, George (1757-1798)," National Centre of Biography, Australian National University, http://adb.anu.edu.au/.
[viii] Douglas R.G. Sellick, *First Impressions Albany: Travellers' Tales 1791-1901* (Perth: Western Australian Museum, 1997). p. 14.
[ix] Ibid. p. 27.
[x] Ibid. p. 29.
[xi] Ibid. p. 39-43.
[xii] L. Radzinowicz, "The Waltham Black Act: A Study of the Legislative Attitude Towards Crime in the Eighteenth Century," *The Cambridge Law Journal* 9 (1945).
[xiii] *Geoffrey Robertson, Dreaming Too Loud (Sydney: Vintage, 2013).* Robertson wrote that time and again, juries wrote that the value of goods stolen was 39 shillings. If you stole 40 shillings' worth, defendants went to the gallows.
[xiv] Clive Oppenheimer, "Climate, Environmental and Human Consequences of the Largest Known Historic Eruption: Tambora Volcano (Indonesia) 1815," *Progress in Physical Geography* 22, no. 2 (2003).
[xv] John E. Archer, *By a Flash and a Scare: Arson, Animal Maiming, and Poaching in East Anglia 1815-1870* (London: Breviary Stuff Publications, 2010). See also B. Short, *Apples and Orchards in Sussex,* p. 83.
[xvi] Margaret Willes, *Gardens of the British Working Class* (New Haven and London: Yale University Press, 2014). p. 114.
[xvii] Don Garden, *Albany, a Panorama of the Sound from 1827* (Melbourne: Thomas Nelson (Australia) Limited, 1977). p. 13.
[xviii] Ibid. p. 14
[xix] Amy Gardos, "The Historical Archaeology of the Old Farm on Strawberry Hill: A Rural Estate 1827-1889, Albany, Western Australia" (University of Western Australia, 2004). p. 217.
[xx] C.A. Gardner and H.W. Bennetts, *The Toxic Plants of Western Australia* (Perth: West Australian Newspapers Ltd, 1956).
[xxi] D.A.P. West, *The Settlement on the Sound* (Perth: The Western Australian Museum, 1976). p. 77.
[xxii] Frederick Watson and Peter Chapman, *Historical Records of Australia*, vol. 6 (Sydney: Library Committee of the Commonwealth Parliament, 1921). pp. 506-512.
[xxiii] Ibid. p. 531.
[xxiv] John Mulvaney and Neville Green, *Commandant of Solitude: The Journals of Captain Collet Barker 1828-1831* (Melbourne: Melbourne University Press, 1992). p. 352-353.
[xxv] Ibid. p. 86.
[xxvi] Charles Fraser, "List of Seeds and Plants Forwarded from the Botanic Gardens at Sydney for the Settlement at King George Sound May 1827," (NSW Govt State Records, 1827).
[xxvii] Mulvaney and Green, *Commandant of Solitude: The Journals of Captain Collet Barker 1828-1831*. p. 353.
[xxviii] Gwen Chessell, *Alexander Collie: Colonial Surgeon, Naturalist and Explorer* (Perth: University of Western Australia Press, 2008). p. 153.
[xxix] *Richard Spencer: Napoleonic War Hero and Australian Pioneer* (Perth: University of Western Australia Press, 2005). p. 60-64.
[xxx] Ivan Bird, *The Story of Strawberry Hill: Middleton Road Albany Western Australia 1791-1891* (Albany: self). p. 45.
[xxxi] Chessell, *Richard Spencer: Napoleonic War Hero and Australian Pioneer*. p. 84-85.
[xxxii] Ibid.
[xxxiii] Gardos, "The Historical Archaeology of the Old Farm on Strawberry Hill: A Rural Estate 1827-1889, Albany, Western Australia." p. 217.
[xxxiv] Ibid. p. 223.
[xxxv] Bird, *The Story of Strawberry Hill*. p. 97
[xxxvi] Brent Elliott, *Victorian Gardens* (Portland, Oregon: Timber Press, 1986). p. 19.
[xxxvii] Philip Short, *In Pursuit of Plants: Experiences of Nineteenth and Early Twentieth Century Plant Collectors* (Perth: University of Western Australia Press, 2003). p. 332-333.
[xxxviii] Passenger aboard the P&O company's steamship *Malta*, "Visit to King George's Sound," *The Inquirer and Commercial News 1855-1901*, Wednesday 23 June 1869. p. 3.
[xxxix] Bird, *The Story of Strawberry Hill*. p. 97.